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ABSTRACT

Except for the increasing labor force shares of youth in the early 1970s, the impact of the changing age and sex composition of the labor force did not make a significant contribution to rising unemployment rates between 1969 and 1982. When compared to the recoveries over that period, however, the current recovery is marked by a significant impact of the changing shares of different age groups, especially the declining share of teenagers. In general, the movement of the baby-boom cohort into prime age groups with their relatively lower rates of unemployment has tended to decrease the natural rate of unemployment. During 1969-88, the average level of educational attainment has increased. Job loss was the dominant reason for unemployment from 1962 to 1988. Although there was a dramatic decrease in the labor force share of the manufacturing sector and a relative increase in the service-producing sector, industry decomposition of the labor force suggests these shifts did not have a significant impact on the secularly rising unemployment rates between 1969 and 1982. Across that period there was a dramatic increase in the proportion of individuals who are long-term unemployed, an increase that has not been reversed by the current upward trend. That increase has been due to increased representation of 25- to 44-year-old males and people who have lost jobs. No single industry has experienced disproportionate gains or losses in its share of total long-term unemployment. Unemployment may be reduced by increasing aggregate demand through fiscal policy, increasing investments in education and training, improving information on job availability and persistence, and increasing the flexible use of labor within firms. (The document contains 9 tables, 4 charts, and 27 references.) (CML)

15. THE UNEMPLOYMENT EXPERIENCE OF THE WORKFORCE

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The current economic recovery breaks a trend dating back to 1969 of rising unemployment rates at each stage of the business cycle. The current good news allows some breathing room to consider the sources and policy implications of the unsettling upward trend in the unemployment rate.

This paper reviews evidence of changes in labor supply, labor demand, and market function that might contribute to long-run increases in the unemployment rate. Section I explains some basic unemployment measures, and discusses demographic shifts in the age, gender, race, and education of the labor force. Section II shows the relationship of these demographic shifts to unemployment, and also examines increases in the rate of job loss and in the duration of unemployment. The last section reviews a recently developing area of research on the volatility of labor demand, and discusses the implications of job creation and destruction patterns in the U.S. economy for unemployment.

I. Secular Increases in Aggregate Unemployment Rates

Between 1969 and 1982, the civilian unemployment rate increased secularly. A comparison of the "low" unemployment rates reached in successive recoveries and the "high" unemployment rates in successive recessions indicates this upward drift. Comparing successive recoveries,

the "low" unemployment rates reached during those periods were 3.4, 4.8, 5.7 and 7.4 percent respectively. Comparing successive recessions, the "high" rates were 6.0, 8.9, and 10.7 respectively (See Chart 1 and Table 1).[1]

The current economic recovery, the longest peacetime expansion in the post World War II era, has posted a decline in civilian unemployment rates from 10.7 percent in 1982Q4 to 5.3 percent in 1988Q4 (See Chart 1). This latter rate lies below the "low" rate of 5.7 percent associated with the 1975-80 recovery. Has the current recovery ended the general upward drift in unemployment rates? The answer must await the judgement of future cyclical turns in the economy. However, even if the next recession brings a return to the general upward trend, the current recovery will represent a significant break in the pattern.

What lies behind the trends in the overall unemployment rate? As the economy experienced secularly rising unemployment rates over the 1969-82 period, what proportion of those increases can be explained by the shifting composition of the labor force? To what extent were the overall rising unemployment rates simply reflected in rising unemployment rates of various labor force groups? And finally, what has been the impact of the current recovery?

Since 1969, the economy has experienced, among other changes, a dramatic increase in the labor force participation of women, the movement of the baby-boom generation into prime-age groups, and a relative decline in the employment share of the cyclically sensitive industries in the goods-producing sector of the economy.

To capture the influence of these and other trends, the analysis in this section is based on the following stratifications of the unemployed: age, sex, educational attainment, reason for unemployment, industry affiliation of last job, and length of unemployment spell.[2] The goal is to characterize the nature of both the secular rise in unemployment rates over the 1969-82 period and the impact of the current economic recovery. Accordingly, comparisons are made of the respective "low" unemployment rates reached in the successive recoveries of the 1969-88 period. Similarly, comparisons are made of the respective "high" unemployment rates of successive recessions. Owing to the shortness of the mini-recession and recovery between 1980 and 1981, the cyclical points associated with these periods are not included in the analysis.

The broad conclusions drawn in this analysis are as follows:[3]

(1) The secularly rising unemployment rates between 1969 and 1982 had relatively even impacts across demographic groups. Except for the increasing labor force shares of youth in the early seventies, the impact of the changing age and sex composition of the labor force did not make a significant contribution to rising unemployment rates between these dates. When compared to the recoveries over the 1969-1982 period, however, the current recovery is marked by a significant impact of the changing labor force shares of different age groups, especially the declining share of teenagers. In general, the evidence in this paper suggests that the movement of the baby boom cohort into prime age groups with their relatively lower rates of unemployment has tended to decrease the natural rate of unemployment.

(2) Over the entire 1969-88 period, the average level of educational attainment has increased. Over the same time period, the labor force participation rates of individuals with less than 4 years of high school have fallen steadily, while rates of other educational attainment groups have risen. The unemployment rates of each educational attainment group has mirrored the behavior of overall rates. The net effect of these changes on both the rising trend in unemployment rates between 1969 and 1982 and the decline in overall rates between 1979 and 1988 has been neutral. In fact, declines in the labor force shares of individuals with less than 4 years of high school served to

make the overall unemployment rate lower than it otherwise would have been.

(3) Among the various reasons for becoming unemployed, job loss among both sexes increasingly dominated the secularly rising unemployment rates between 1969 and 1982. Over this same period, women reentering the labor force and, to a lesser extent, newly entering females, became increasingly important in explaining changing unemployment rates. This trend has continued into the current recovery.

(4) Overall, while there was a dramatic decrease in the labor force share of the manufacturing sector and a relative increase in the service-producing sector, industry decomposition of the labor force suggests these shifts did not have a significant impact on the secularly rising unemployment rates between 1969 and 1982.

(5) Across the 1969-1982 period, there was a dramatic increase in the proportion of individuals who are long-term unemployed. The current recovery has not reversed this upward drift.

(6) The shift toward long-term unemployment has largely been due to increased representation of 25-44 year-old males and job losers. However, the representation of these groups in long-term unemployment has mirrored their representation in the overall unemployment pool. Finally, this shift has largely been neutral across industry groups; that is, no one industry has experienced disproportionate gains or losses in their share of total long-term unemployment.

A. Some Basic Facts on Unemployment

Each month, the Census Bureau conducts the Current Population Survey (CPS), a survey of about 55,000 households nationwide. The information collected in the survey forms the basis for unemployment statistics. Within the framework of this survey, an individual is unemployed if he or she did not work at all during the survey week, was looking for work in the prior four weeks, and was available for work during the survey reference period. Individuals waiting to be recalled to a job or those waiting to report to a new job within 30 days are also considered unemployed. The civilian unemployment rate equals the proportion of the civilian labor force which is unemployed, where the

labor force is the total of employed and unemployed individuals. This measure does not include discouraged workers and others who drop out of the labor force. Nor does it count as unemployed those involuntarily working part-time, or the functionally unemployed kept on a firm's payroll. Obviously, those employed "off the books" in the underground economy are also not counted.

To review the trends in the labor force and unemployment over the 1969-88 period, it is useful to divide the population into major labor force groups. First, a division of the unemployed into groups of teenagers, adult men, and adult women shows that the unemployment rate of teenagers is consistently higher than for either adult males or females (See Chart 2). Further, until 1982, the unemployment rates of adult males were consistently lower than for adult females. Since 1982, equality between the sexes has been the norm. The labor force participation rates of adult men and women overall are also telling. In the post-World War II era, the participation rates have steadily declined for adult men and steadily increased for adult women. The pattern for adult women was particularly sharp over the 1969-82 period. Another significant trend which has developed in the last two decades is the rising proportion of the population that is employed. The employment-population ratio, although sensitive to cyclical swings in the economy, has increased markedly since the 1973-75 recession, especially in the current recovery.

Second, a division of the unemployed by age groups shows that, as expected, unemployment rates decline with age. The civilian labor force shares of individuals in the 16-24 age group peaked in the 1970's. The

civilian labor force participation rates of this group increased over the entire three decades, although showing evidence of a slowdown in the 1980's. The civilian labor force share and the participation rates of the 25-34 age group reach plateaus in 1986 and 1987, respectively. As a result of the aging of the baby boom cohort, the labor force shares of the 35-44 age group declined until the mid-seventies and have been increasing since. The labor force participation rates of this group steadily increased over the entire 1960-88 period.

Third, a division of the unemployed by race shows the unemployment rates of blacks tend to be much higher than for whites, while the unemployment rate of Hispanics is generally between that of blacks and whites (See Chart 3).

Fourth, a division of the population by level of educational attainment shows that the average level of educational attainment has increased steadily since 1969. Consistent with this increase has been the steadily falling proportion of the population with less than 4 years of high school, a stable proportion with exactly 4 years of high school, and steady increases in the proportions with 1-3 years of college and 4 years of college of more. The same trends hold true for a division of the labor force into educational attainment groups.

In addition, the unemployment rates of each educational attainment group has mirrored the behavior of overall rates, although the extent of secular increase over the 1969-82 period was most pronounced in groups with educational attainment levels of less than high school and high school only.

Although these divisions of the unemployed into various groups contribute to our understanding of unemployment, our knowledge is enhanced further if we also examine the dynamic flows in and out of unemployment over time. One way to capture these dynamic movements is to measure the average total length of time a newly unemployed individual can expect to remain unemployed.

Although estimates of duration vary, measures of average time spent unemployed are consistently found to be countercyclical. The official measure from the CPS typically ranges between 4 and 12 weeks, and has exhibited a strong secularly increasing pattern over the entire 1969-86 period. This measure, however, captures the average age of unemployment spells among the currently unemployed as of the survey date. Studies of the average total time a currently unemployed individual remains unemployed report estimates in the range of 8 to 16 weeks (Akerlof and Main, 1980). In contrast, studies examining the expected completed spell length of newly unemployed individuals find shorter average spell lengths, in the range of one and one-half to three and one-half months (Sider, 1985; Horrigan, 1987). In these latter studies, the countercyclical nature of duration is evident, but there is no indication of a secularly increasing pattern.

Measures of average spell length are summary statistics, and although informative, do not shed much light on the underlying distribution of spell lengths. In particular, across the entire 1969-1982 period, there was a dramatic secular increase in the proportion of individuals who are long-term unemployed (27 weeks or more). The current recovery has not reversed this upward drift. For

example, the percentage of individuals in long-term unemployment spells in 1988Q4 (11.3%) was far above the previous low percentage value recorded in the 1975Q2-1980Q1 recovery (8.3%).

II. Sources of Secular Increases in Unemployment Rates

This section uses a decomposition approach to estimate the degree to which changes in the demographic composition of the labor force have contributed to the secularly increasing unemployment rates between 1969 and 1982, and the effect of demographic factors in the current recovery.[4]

A. Demographic Factors

Table 2 traces the contribution of age groups to the secularly rising unemployment rates between 1969 and 1982, and to the decline in overall rates in the current recovery. There are three noteworthy features to these tables. First, between successive recoveries and successive recessions, it is the changing unemployment rates within age groups which explain the vast majority of changing overall rates. The contribution of changing labor force shares between different age groups is, with few exceptions, very small.

Second, between 1969Q1 and 1973Q2, when baby boomers were entering the 16-19, and to a lesser extent, the 20-24 age groups, the increasing labor force shares of youth exerted upward pressure on overall unemployment rates. Though relatively small, the impact of changing labor force shares over this period is consistent with the fact that unemployment rates of teenagers tend to be substantially higher than for

any other group, followed by the unemployment rates of the 20-24 age group.

Third, the decline in labor shares of teenagers between 1979Q2 and 1988Q4 and the demographic movement of the baby boom into prime age groups resulted in a natural rate of unemployment which is lower than it otherwise would have been over the period.

The impacts of changes in the unemployment rates and the labor force shares of men and women are shown in Table 3. Changes in the unemployment rates of the two sex groups explain nearly all of the secular increase in aggregate unemployment rates between 1969 and 1982. A comparison of the declining unemployment rates between the two recovery periods, 1979Q2 and 1988Q4 also indicates the predominant role of changing unemployment rates within each group.[5] Consistent with the fact that labor force participation rates of females have increased substantially, the impact of changing labor force shares between men and women became slightly larger across the successive recoveries and the successive recessions of the 1969-82 period. However, the magnitude of these effects are small. Changes in labor force shares by sex explain very little of the secularly rising unemployment rates over the period.

B. Educational Attainment

As discussed previously, educational attainment levels of the labor force have trended up since 1969. Ceteris paribus, an increase in educational attainment has the effect of putting downward pressure on unemployment rates. However, between 1969 and 1982, the magnitude of this effect is small, overshadowed by secularly increasing unemployment

rates within each educational attainment group. While the degree to which unemployment rates trended up was most pronounced for those with less than a high school degree, the pattern for each educational attainment group reflected the movement of the overall unemployment rate.

As a result, a separate comparison of the successive recessions and the successive recoveries between 1969 and 1982 leads to the observation that shifts in the educational attainment of the labor force did not have a pronounced impact on the trend in unemployment rates. The single most important factor was the behavior of unemployment rates within each educational attainment group. Again, a comparison of the 1975Q2-1980Q1 recovery with the current period does not change this conclusion.

C. Reasons for Unemployment

The reasons for being unemployed are divided into four broad categories: job loser, job leaver, reentrant to the labor force, and new entrant to the labor force. The job loser category is further divided into those on layoff and those who are not.

Job loss represents the largest single group in a division of the unemployed by reason for unemployment. Over the 1968-88 period, job losers accounted for an average 47 percent of the unemployed. Over this same time period, those who lost their jobs for reasons other than layoff represented 69 percent of job losers, a sizeable proportion which also exhibited an increasing trend over the period.

The second largest group are reentrants, making up 28 percent of the unemployed on average over the last two decades. The other categories, job leavers and new entrants are smaller in relative size, each representing approximately 13 percent of the unemployed. Across these groups, both categories of job losers tend to be strongly countercyclical, while job leavers are less variable but procyclical. Both new entrants and reentrants to the labor force are procyclical, providing tentative evidence that the added worker effect dominates the discouraged worker effect.

In assessing the contribution of reason for unemployment toward explaining secularly rising unemployment rates, it is not possible to use the decomposition approach employed above. This approach requires estimating the size of the labor force of each group which, of course, is not possible for this particular stratification of the unemployed. Instead, the overall unemployment rate was expressed as the sum of ratios, where each ratio is the level of unemployment by reason, divided by the size of the overall labor force. A change in unemployment rates can then be expressed as the sum of changes in these ratios.

Applying this technique, the job loser category clearly dominated the upward drift in unemployment rates over the 1969-82 period, and in proportions which are much greater that their representation among the unemployed. The next most significant group were reentrants to the labor force, especially through the mid to late seventies. It has been suggested that the reentrant category is dominated by job losers. The extent to which this is true further strengthens the impact of job loss on the secular rise in unemployment over the period.

In addition, the decline in unemployment rates between 1979Q2 and 1988Q4, the comparison dates for the 1975-1980 recovery and the current period, reveals a notable shift toward the reentrant and new entrant categories in explaining the decline in unemployment rates between these two periods.[6]

D. Industry Groups

The decomposition of industry unemployment rates does not support the view that the shift between the goods-producing sector (especially manufacturing), and the service-producing sector was the cause of secularly rising unemployment rates over the 1969-82 period. In each comparison over this period, the effect of changing labor force shares by industrial affiliation is insignificant. In contrast, a comparison of the current recovery with the 1975-79 period does show a slightly greater effect of shifting labor force shares across industries. In all, labor force shifts across industries account at most 9 percent of the reduction in overall unemployment rates between 1979Q2 and 1988Q4.

To understand these results, it is particularly important to account for changes in both industry unemployment rates and the relative share of the civilian labor force within each industry. The patterns in manufacturing are a case in point. Over the 1969-82 period, manufacturing's share of the labor force fell steadily over time from 36.9 percent in 1969Q3 to 27.3 percent in 1982Q4. By 1988Q4, this figure had fallen further to 24.1 percent. As well, over the 1969-82 period, the unemployment rates within manufacturing were posting secular increases. These rates have fallen markedly in the current

recovery--from a high of 14.2 percent in 1982Q4 to 5.2 percent in 1988Q4, matching the low reached during the 1975-79 recovery.

The decline in the industry's relative share over the 1969-82 period acts to diminish its percentage contribution to explaining secularly rising unemployment rates. However, the secularly rising unemployment rates within the industry acts in the opposite direction.

In other words, within manufacturing, unemployment rates increased secularly over the 1969-82 period, although a smaller proportion of the civilian labor force was in manufacturing. Which effect dominated? As it turns out, the decline in manufacturing's labor force share did little to offset changes in manufacturing unemployment rates. One exception to this occurred in the comparison between 1975Q2 and 1982Q4 in which the declining labor force share nearly offset the rising unemployment rates in manufacturing between the two periods.

Turning to the service-producing sector, labor force shares in this sector have been rising since the early seventies. In particular, average civilian labor force shares in the finance and services industries have risen from 26.0 percent in 1969Q3 to 32.3 percent in 1982Q4. By 1988Q4 this figure had risen to 35.9 percent. As with the manufacturing sector, unemployment rates in the service-producing sector trended upward over the 1969-82 period, falling during the current recovery to 4.4 percent in 1988Q4, below the low posted during the 1975-79 recovery. Moreover, unemployment rates in the service-producing sector, especially in the finance and services industries, are consistently lower than overall nonagricultural unemployment rates. Over the 1969-88 period, the average unemployment rate in the finance

and services industries was 5.3 percent, compared to the 6.8 percent rate overall.

As with manufacturing, changing unemployment rates were of greater relative importance than changing labor force shares. One exception, also consistent with manufacturing, was the greater relative impact of labor force shares as compared to changing unemployment rates in the sector between 1975Q2 and 1982Q2.

When the shifts in labor force composition by industry are taken as a whole, however, their net impact on the secularly rising unemployment ra s of the 1969-82 period are not significant. Changes in industry unemployment rates explain nearly all of the trend.

Finally, although the current recovery shows a slightly greater impact of shifting labor force shares than in any other comparison period (nearly 9 percent), changing unemployment rates still account for nearly 75 percent of the fall in unemployment rates between 1979Q2 and 1988Q4.

E. Length of Unemployment

One of the most striking aspects of the 1969-88 period is the secular increase in the proportion of the currently unemployed who have been unemployed for 27 weeks or longer, or long-term unemployment.[7] Chart 4 demonstrates the pattern. Indeed, as of the fourth quarter of 1988, the percentage of the unemployed in long-term spells (11.3%) remains higher than the low value associated with the 1975-1980 recovery (8.3%). Although not shown in Chart 4, the same pattern emerges for those unemployed 15 weeks or longer or 52 weeks or longer.[8]

As is generally the case, the composition of the long-term unemployed over the 1969-88 period has differed considerably from the makeup of total unemployment. Membership in long-term unemployment is more likely to be comprised of prime-age and older males, job losers, and workers from cyclically sensitive industries such as manufacturing than are the unemployed as a whole.

The question of interest in this analysis is the extent to which the secular increase in the relative size of long-term unemployment has also changed the composition of the long-term unemployed. For example, has the degree to which job losers are overrepresented in long-term unemployment changed appreciably as the percentage of individuals in long-term spells has increased?

To analyze what lies behind the shift to long-term unemployment, annual average values of the relative number of individuals who are newly, short-term, medium-term, and long-term unemployed were constructed. These estimates were broken down by age, sex, race, reason for unemployment, and industry affiliation of last job.

The following general conclusions emerge: First, over the entire 1969-88 period, two groups were represented disproportionately, 25-44 year-old males and job losers. However, even though these two groups normally make up a disproportionate share of long-term unemployment, their degree of overrepresentation has not changed over time.

Second, the industry composition of the long-term unemployed was also fairly neutral; that is, the burden of long-term unemployment, while always falling disproportionately on individuals from cyclically sensitive industries, did not shift noticeably between groups defined by

industry affiliation (See Table 4). The one exception to this latter result is the relative shift which occurred within durable goods industries in terms of their representation among the long-term unemployed. In particular, over the 1969-88 period, manufacturing's share of the long-term group fell while that of construction and mining rose. Aside from these shifts, the remaining industry groups did not exhibit either a growing or falling trend (See Table 4).

The importance of these findings is underscored by the recent work of Summers (1986) and of Topel and Murphy (1986)[9] who view the shift toward long-term unemployment as the main reason underlying the secular increase in unemployment between 1969 and 1982. Despite a decline in the proportion of the unemployed receiving unemployment insurance benefits, unemployment spells have become longer. Increases in wage dispersion and increases in the proportion of working spouses, along with the unusual sectoral shocks of recent years, may have led displaced workers to search longer while unemployed.

F. Time Spent Unemployed

What is the implication of the shift in the distribution of time unemployed toward individuals with longer spells as to the burden of unemployment on the average individual? One might reasonably postulate this evidence indicates the average individual is experiencing spells of longer duration. Because of the dynamic nature of unemployment, however, this is not necessarily the case.[10] The division of the unemployed into long, medium, short and newly unemployed groups is a division of the currently unemployed. However, the currently unemployed

at any survey date represent only the remaining members of all previous newly unemployed groups. It is misleading to use information on the currently unemployed to judge how long a member of newly unemployed group remains unemployed.

How then have the dynamics of unemployment worked over the 1969-88 period? As individuals entered unemployment over these years, what happened to their likelihood of experiencing a long spell of unemployment? To answer this latter question, the percentage of newly unemployed individuals (that is, those with less than 5 weeks of unemployment at a survey date) remaining unemployed at least 8 months was calculated.[11] This statistic was calculated for newly unemployed groups on a monthly basis for the low unemployment rate years (1969, 1973, 1979, and 1988), as well as for the high unemployment rate years (1971, 1973, and 1982). Annual averages of these probabilities are reported in Table 5. The trend which emerges is striking. The probability of a newly unemployed individual reaching an 8th month of unemployment rose secularly over the successive recessions and recoveries of the 1969-82 period. A comparison of the current recovery with the one between 1975 and 1979 shows a decline in this percentage, indicating a possible break to the general upward trend in the statistic.

The second piece of evidence comes from a study by Darby, et al., (1987), which calculates the average probability of leaving unemployment from one month to the next for various demographic groups. One of their principal findings is that this probability "tends to be low in manufacturing and construction, and high in non-industrial sectors of

the economy" (Darby et al., 1987, p. 32). They also conclude that the probability of leaving unemployment tends to decrease with age, is higher for women than men, and among reasons for unemployment, is lowest for individuals on permanent layoff.

A drawback of the Darby et al. study, one that reflects a limitation of the Current Population Survey, is the inability to determine if individuals exit unemployment by finding employment or by withdrawing from the labor force. There is a clear need for the development of better longitudinal information on individuals. Such data would make it easier to follow individuals between labor market states and improve our understanding of the dynamics of the labor force.

III. The Demand for Labor

Unemployment can be viewed as arising from insufficient aggregate demand, or from structural and frictional mismatches. One symptom of structural/frictional unemployment is that both the unemployment rate and the vacancy rate are high. People are looking for work at the same time that employers are looking for workers. Because of poor information, or geographic or skill mismatches, vacancies and unemployment coexist.

During the last two decades major structural shocks include the oil shocks of 1973 and 1978, and the trade shocks accompanying the exchange rate shifts of the early 1980s. Low value-added sectors of U.S. manufacturing were particularly sensitive to the trade shocks. Structural changes in the regional distribution of U.S. employment growth also appears to have contributed to rising unemployment (Medoff,

1983). While structural shocks that create the need for labor reallocation across industry lines are more likely to result in unemployment, most employment fluctuation occurs within rather than across industries (Leonard, 1987 & 1988). The resulting frictional unemployment may be increasing.

The degree of structural/frictional unemployment in the U.S. may be far larger than commonly supposed. Leonard (1987) reports that in an average year at the beginning of the 1980s, one in every nine jobs was destroyed, while one in every eight was newly created. These substantial rates of job turnover change slightly over the business cycle, and were of comparable magnitude in most industries The job gain rate is calculated as the net jobs added at growing establishments from one year to the next, divided by total employment in the initial year. Job loss is symmetrically defined, and ignores both employment fluctuations shorter in length than the period between observations, and job loss that is offset within the establishment. For the manufacturing sector, Davis and Haltiwanger (D&H, 1989) report that in an average quarter during the early 1980s, 6 percent of all jobs disappear, and 5 percent are created. From year to year D&H report 8 percent job gain and 13 percent job loss rates. These are similar in magnitude to Leonard's findings for the population of private employers (including non-manufacturing) in one state. However, Leonard does find evidence that more jobs are gained than lost, which is consistent with the history of net job creation in the U.S.

Net job creation is simply the sum of the rates of job gain and loss. It ranges from 20 to 33 percent in annual data, and is even

higher across shorter time periods because of transient short-term fluctuations in employment. This suggests a much more turbulent labor market than is apparent from aggregate statistics of smooth and small net employment changes. In other words, net employment growth on the order of 3 percent is the result of much larger gross flows. Roughly 45 percent of all establishments grow by an average of 30 percent, 47 percent of all establishments shrink by on average 21 percent, and the remaining 8 percent of establishments maintain stable employment (Leonard, 1987). Employment levels are anything but stable at the typical establishment. Unemployment rates on the order of 6 percent then suggest a remarkably fluid and adaptable labor force in the face of the annual disappearance of 10 to 25 percent of all jobs.

The rates of job creation and destruction calculated from periodic counts of total establishment employment are of similar magnitude to annual rates of new hires and layoffs previously collected by the BLS. Between one-third and three-quarters of the new hires and layoffs rates can be accounted for by job creation and destruction (Leonard, 1987). The job destruction rates are also comparable in magnitude to the flow from employment to nonemployment reported by individuals in the CPS (Leonard, 1987).

If all who desire stable long-term employment can find it, or are compensated for bearing the risk of unstable jobs, there is little room for government intervention. There are, however, a number of reasons to think this is not the case. Job turnover at the establishment level depends on the path of employment over time, but this is very difficult to predict (Leonard, 1987, 1988). There is tremendous heterogeneity in

employment growth rates not only across different establishments, but also for the same establishment over time. It is difficult to segregate establishments into stable and unstable groupings. Small employers do tend to be more unstable, but their small size makes it less likely that they develop widespread reputations. There is only weak evidence that a compensating differential is paid for employment in unstable jobs (Abowd & Ashenfelter, 1981). The shock often expressed by workers displaced from jobs they believed to be permanent is evidence that unstable workers have very imperfect information on which jobs are stable and which are not.

The data on job destruction can be used to augment the sketchy data on job duration. If 6 percent of jobs disappear each quarter (D&H, 1989) in steady state with homogeneous jobs, then a job is expected to last just over 4 years. This refers not to a job-worker match, but to the existence of the job itself irrespective of who fills it. Jobs of such limited duration are likely to frequently fall short of the duration desired by workers. However, job loss is not evenly distributed. Newly created jobs in new firms suffer from high infant mortality rates. It is possible for high turnover rates to coexist with a high proportion of stable jobs, if turnover is concentrated in a few positions. While the data required to determine the concentration of turnover are currently unavailable, job turnover of roughly similar magnitude appears to be a pervasive phenomenon across industries, regions, size classes, and many countries (Leonard, 1986, 1987 & 1988; D&H, 1989; OECD, 1988).

Job growth has a large transient component that is more pronounced in shorter time intervals. When measured on an annual basis, job loss rates appear to be in a narrow range from 11 (Leonard, 1987) to 13 (D&H, 1989) percent. In steady state, this yields expected job durations of 7 to 9 years. At the other extreme, comparing employment levels 5 years apart, Dunne, Roberts, and Samuelson (1987) report that the average job in manufacturing lasts about 20 years. This is almost certainly an overestimate because the short duration jobs that are born and die between censuses are not counted at all, and because job loss is not counted if other employment shifts leave establishment size unchanged. Using data on individual workers, Hall (1982) reports that the expected median tenure of a worker in 1978 was about 8 years (completed spell). It seems likely that the high rate of job destruction contributes to short duration job-worker matches. While most workers eventually find their way into long duration jobs, they typically first transit through a number of short duration jobs, not all of which are mismatches. The rate of annual job loss is not trivial. It may account for a substantial part of the underlying rate of unemployment. This is often referred to as the "natural" rate of unemployment. Being "natural" it is often thought of as an irreducible part of a normally functioning economy or, alternatively, not thought of at all. To illustrate, suppose the 6 percent quarterly job loss rate calculated by D&H applies in steady state to the whole economy, and captures all job loss. (In reality it will miss short duration jobs and job turnover that leaves establishment size unchanged.) This amounts to an annualized 24 percent rate of job loss. Suppose only half of this job loss results in any

unemployment, and that a completed unemployment spell lasts 3 months. This yields an unemployment rate of 3 percent, or two-fifths of the 7.5 percent average unemployment rate during the 1980s.

A number of factors have led to speculation that the "natural" rate of unemployment is now lower than before. As we have already mentioned, the teenage proportion of the labor force has declined. In addition, unions represent a lower percentage of the workforce, and have recently been less aggressive in pursuing wage gains. The U.S. economy has become more open to international competition, which along with the deregulation of some major industries increases competitive constraints on wages. The reorganization of large corporations, with a growing "informal" sector of arms-length, part-time, or sub-contracted workers to accommodate peak demands may also help lower the unemployment rate attainable before inflation accelerates. The next section asks whether these factors leading to a reduction in the "natural" rate may have been outweighed by the increasing instability of jobs.

A. Changes Over Time

Is the underlying rate of unemployment higher today than in previous years because all jobs have become more unstable, perhaps because of faster technological change, a more open economy, or more competitive markets? The available historical data do not extend far enough back to give adequate perspective on this question. Based on quarterly data in the manufacturing sector, the annualized job turnover rate ranges from 33 (1979) to 53 (1982) percent (D&H, 1989). The annualized rate of job loss rises from 16 percent in 1979 to 33 percent

in 1982, before falling to 21 percent in 1983, and so appears cyclical. Job gain rates also increase from 17 percent in 1979 to 25 percent in 1983 (D&H, 1989).

Using annual data on Wisconsin establishments, Leonard (1987) finds job turnover rates rising from 22 percent in 1979 to 34 percent in 1982, but again over too short a time period to discern a clear pattern. Job loss rates range from 7 percent in 1978 to 16 percent in 1982. Job gain rates range from 9 percent in 1981 to 18 percent in 1982. In a national sample of larger firms between 1978 and 1984, there is no strong evidence that the variance of establishment growth rates has increased over time (Leonard, 1988). While none of this evidence allows us to compare present conditions with those of the 1960s, it would be useful if such information were systematically collected so that we could tell whether increases in unemployment were due to a more challenging world (more unstable jobs), or to less success in meeting a constant challenge.

There is considerable evidence that the reallocation of labor across industries increases with (and may account for part of) the business cycle. Increases in the unemployment rate are associated with more uneven growth across industries (Lilien, 1982). In part this reflects the greater cyclical sensitivity of the manufacturing sector (Abraham and Katz, 1986). It may also indicate the transmission of shocks, such as the oil price increases of 1973 and 1978 through the manufacturing sector to the economy as a whole (Hamilton, 1988). In any event, much of the increase in unemployment during a recession is accounted for by the loss of manufacturing jobs. The evidence on

cyclical changes in job turnover is sketchy and mixed. Leonard (1987) reports weak evidence that the variance of growth rates across establishments rises with the unemployment rate. Industries with the fastest growth rates also appear to have the most dispersed growth rates. For manufacturing plants, Davis and Haltiwanger (1989) report a contrasting result: the job turnover rate is lower when industry growth is greater. If true, this suggests that employment growth not only reduces unemployment directly, but also indirectly by reducing labor reallocation across plants within industry.

B. Job Stability by Industry

Shifts in labor demand derived from shifts in consumer demand, technological innovation, or trade or regulation changes, have had different effects on trend growth rates across industry. The role such factors play in accounting for differences in job stability across industry is less well clear. Job instability appears to be a pervasive phenomenon, with relatively minor differences across industries that yield few clues to suggest specific causes. Job instability is not limited to a few industries or regions, to the manufacturing sector, to unionized plants, to industries subject to rapid technological change, or even to nations with certain regulatory structures (Leonard, 1986, 1987, & 1988; OECD, 1988).

Within manufacturing, average annual job turnover rates between 1980 and 1983 range from 14 percent in the paper industry, to 27 percent in the lumber industry. Job loss rates range from 8 percent in tobacco and in paper, up to 17 percent in lumber. Job gain rates range from 4

percent in primary metals to 11 percent in apparel (D&H). It is notable that the most unstable industry, lumber, is also among the least affected by technological change, by import competition, or by shifts in consumer demand across differentiated products. Two industries commonly viewed as undergoing rapid technological change, chemicals and electrical machinery, have job turnover rates that are respectively below and slightly above average (D&H). Similarly, exposure to recent upheavals in trade and exchange rate fluctuations do not strongly differentiate industry turnover patterns. Primary metals and transportation equipment, around which many trade battles have been fought, have job turnover rates one percentage point below and above the mean, respectively. The instability of jobs in the apparel industry presents a stronger case for trade pressures, although it may simply reflect an industry of smaller plants dependent on changing tastes.

Certain industries, particularly in durable goods manufacturing, are more sensitive to the business cycle. Their job turnover rates vary more over time. The highest time-series variance of job turnover are found in primary metals, non-electrical machinery, apparel and lumber (D&H, 1989). Except for apparel, the outputs from these industries are all inputs into long-term investments that are known to be sensitive to the interest rate. Apparel is unusual among this group. It has high and variable turnover rates, for reasons already mentioned.

Some evidence suggests that job loss within industry becomes more concentrated in a few plants as industry or economy wide employment declines (D&H, 1989). A growing industry or economy tends to spread employment growth more evenly across plants, reducing the variance of

growth rates. The tendency of job losses to be concentrated in fewer plants during a downturn perhaps helps explain recent support for plant closing legislation, even though plant closings account for no more than 15 percent of all jobs lost from quarter to quarter, or from 17 to 38 percent of annual job loss (D&H). The contribution of plant closings is smaller in quarterly than in annual data because transient employment changes play a larger role across shorter time periods.

The long-run employment trend in industrialized countries out of manufacturing and into services is well-known. This is expected to reduce cyclical unemployment because the service sector is generally less cyclically sensitive than is manufacturing. Indeed, job turnover rates do vary less over the business cycle in services than in manufacturing (Leonard, 1987). However, at any point in time, service sector jobs are less stable than those in manufacturing. The movement from manufacturing to services is a move to jobs that are more stable over the cycle, but less stable at any point in the cycle. This should make cyclical stabilization policies easier to pursue, but raise the difficulty of reducing steady-state rates of unemployment.

More flexible wages are commonly proposed as a means of reducing employment fluctuations in the face of volatile demand. Union plants are often thought to have wages that are not only too high, but also too rigid. Employment does appear to grow less rapidly, if at all, in union plants. However, apart from this trend, union jobs appear no more unstable over time than do similar non-union jobs (Leonard, 1985). This suggests either that the role of wage rigidity has been overemphasized,

or else that rather than being a problem unique to the union sector, it is widespread among large plants irrespective of unionization.

The occupational mix within a plant affects both its growth and its stability. Within industry, employment growth rates are significantly faster in plants with a greater proportion of white-collar workers (Leonard, 1988). In part, this may reflect a U.S. comparative advantage in skill-intensive products. There is little reason to expect the U.S to compete successfully in industries requiring neither physical nor human capital against countries well-endowed with unskilled labor. To compete successfully in capital intensive industries will require continued investments in technological advance, education, and other capital improvements. The necessity of considering such investments is heightened in view of hints of a coming mismatch between the skills required by growing industries and those supplied by the next generation (U.S. B.L.S., 1987). Already, returns to education are rising. A growing share of the workforce will be composed of groups, such as Hispanics, that have typically had lower education levels than average. Investments in education will tend to reduce social divisiveness and improve future productivity (Leonard, 1989).

More skilled jobs also appear to be more stable. Employment levels fluctuate less over time in establishments with a higher proportion of white-collar workers (Leonard, 1988). In part because of the more durable bonds between workers and employers with joint investments in firm specific skills, white collar workers are less likely to be displaced (Oi, 1962).

C. Useful Information

The types of unemployment discussed here point towards additional information that would help show where the problem of unemployment lies. Some information is already collected by the government for other purposes, and merely needs to be reorganized and made more accessible. Other information might only be available through additional data collection.

First, consider making fuller use of information that already sits deep within various federal and state bureaucracies. Start with an obscure, but perhaps for that very reason, typical example. Data on separations and accessions at the plant level can be useful in judging flows into and out of unemployment. In the past, such information was collected and published by the Department of Labor, but fell victim to budget restraints. Less well known is that such data continues to be collected by another branch of the Department of Labor for a fragmentary but not insubstantial sample, as part of the Department's mandated responsibilities to enforce the contract compliance program.

The studies by D&H (1989) and by Dunne, Roberts, and Samuelson (1989) demonstrate innovative uses of the Longitudinal Establishment Data set recently put together by the Census Bureau at relatively modest additional cost from annual data already collected. By constructing a longitudinal file, plants can be followed over time, allowing measures of flows into and out of employment. Similar analyses have been performed using data collected by federal and state governments for other purposes. Job turnover among large employers can be calculated from Equal Employment Opportunity data (Leonard, 1986). Data collected

by the states to administer the Unemployment Insurance program can also be used to measure job growth and turnover (Leonard, 1987).

These all represent creative ways of patching together a makeshift bridge over a gaping hole in U.S. data collection. While the government conducts, supports, and makes publicly available a number of very useful surveys of people (the Census of Population, the Current Population Survey, the National Longitudinal Survey, the Survey of Income and Program Participation), no such survey of employers is publicly available. A number of European governments appear much better informed in this regard. This one-sided data has subtly, but significantly, affected research and policy. For example, much of the debate over unemployment has been framed in terms of the characteristics of people: their education, experience, race, sex, and age. Until recently, relatively little evidence could be marshalled about the instability of jobs themselves, although such evidence may shift the ways we think about unemployment and our policies to combat it. Policies directed toward altering employers incentives or information, or improving employer-employee matches have had much less prominence than manpower training programs. A publicly available employer survey might usefully contribute to the analysis of employment problems by making information available on employment flows including accessions, separations, vacancies, vacancy durations, and applicant queues. Data on levels and changes of wages, benefits, and employment, as well as on tenure, industry, region, occupational mix, corporate structure, inventories, back-orders, geographic and industry scope of marketing, and production

plans are all potentially useful. To give one example, vacancy data are routinely collected in the U.K, making it possible to differentiate cyclical from structural unemployment. These data may also provide a useful guide for government efforts to redirect the unemployed to sectors with many openings. The available data on net employment growth by industry underestimates job openings because even in a declining industry, one-third of the establishments are growing, and even in industries where total employment is shrinking by at least 5 percent, gross job creation typically exceeds 7 percent. Ideally, a matched employer-employee survey would allow analysis of how changes in labor market opportunities affect unemployment and earnings over the working life.

To help provide an informed basis for policy, this paper has focused on the sources and nature of unemployment. The general policy options for reducing unemployment include: 1) increasing aggregate demand through fiscal policy, 2) increasing investments in education and training, 3) improving information on job availability and persistence, 4) reducing barriers to geographic, industry and occupational mobility, and 5) increasing the flexible use of labor within firms. Long-run reductions in the unemployment rate require policies (such as 2-5) that reduce structural and frictional unemployment. These problems develop slowly and rarely present themselves with crisis intensity. This review of the unemployment experience of the last few decades suggests that persistent investments in such long-term policies offer prospects for reducing unemployment.

Table 1a. "Low" unemployment rates associated with the business cycle recoveries of the 1969-88 period, seasonally adjusted, quarterly averages

Recovery period	"low" unemployment rate quarter	unemployment rate
1961Q1-1969Q4	1969Q1	3.4
1970Q4-1973Q4	1973Q3	4.8
1975Q1-1980Q1	1979Q2	5.7
1980Q3-1981Q3*	1980Q4	7.4
1982Q4-1988Q4**	1988Q4	5.3

Table 1b. "High" unemployment rates associated with the business cycle recessions of the 1969-88 period, seasonally adjusted, quarterly averages

Recessionary period	"high" unemployment rate quarter	unemployment rate
1969Q4-1970Q4	1971Q3	6.0
1973Q4-1975Q1	1975Q2	8.9
1980Q1-1980Q3*	1980Q3	7.7
1981Q3-1982Q4	1982Q4	10.7

* Owing to the shortness of the recovery and recession which occurred between 1980 and 1981, the unemployment rates reached in these periods are not included in the analysis

** The recovery which began in 1982Q4 is still underway as of the time of this writing

Table 2a. Percentage decomposition of the total increase in "low" unemployment rates between successive recoveries by age

Comparison dates	Percent contribution: total	due to changing weights	due to changing unemployment rates	interaction effects
1969Q1-1973Q3	100.0	14.3	79.5	6.3
1973Q3-1979Q2	100.0	8.0	91.8	0.3
1979Q2-1988Q4	100.0	132.9	-12.9	-19.9

Table 2b. Percentage decomposition of the total increase in "high" unemployment rates between successive recessions by age

Comparison dates	Percent contribution: total	due to changing weights	due to changing unemployment rates	interaction effects
1971Q3-1975Q2	100.0	6.9	90.7	2.5
1975Q2-1982Q4	100.0	-8.4	105.4	3.0

Table 3a. Percentage decomposition of the total increase in "low" unemployment rates between successive recoveries by sex

Comparison dates	Percent contribution: total	due to changing weights	due to changing unemployment rates	interaction effects
1969Q1-1973Q3	100.0	2.2	97.7	0.1
1973Q3-1979Q2	100.0	6.6	93.8	-0.3
1979Q2-1988Q4	100.0	-17.4	99.1	18.4

Table 3b. Percentage decomposition of the total increase in "high" unemployment rates between successive recessions by sex

Comparison dates	Percent contribution: total	due to changing weights	due to changing unemployment rates	interaction effects
1971Q3-1975Q2	100.0	1.0	99.2	-0.2
1975Q2-1982Q4	100.0	2.4	101.7	-4.1

Table 4a. Breakdown of long-term unemployment by industry, for selected "low" unemployment rate years over the 1969-88 period, annual averages*

Year	"Low" Unemployment rate	Percentage of the long-term unemployed who are in each of the following industry groups: Mn	Con	Mnf	TPU	Trd	Fserv
1969	3.5	0.9	7.0	28.8	5.1	18.8	19.2
1973	4.9	0.5	8.9	25.7	4.7	18.6	20.0
1979	5.8	0.7	7.5	25.7	5.6	16.6	24.2
1988	5.5	2.1	9.6	24.0	5.7	19.0	22.4

Table 4b. Breakdown of long-term unemployment by industry, for selected "high" unemployment rate years over the 1969-88 period, annual averages

Year	"High" Unemployment rate	Percentage of the long-term unemployed who are in each of the following industry groups: Mn	Con	Mnf	TPU	Trd	Fserv
1971	5.9	0.4	6.3	37.9	3.7	17.2	18.5
1975	8.5	0.2	11.5	34.8	4.9	17.2	17.1
1982	9.7	1.5	10.2	32.9	4.8	16.4	19.7

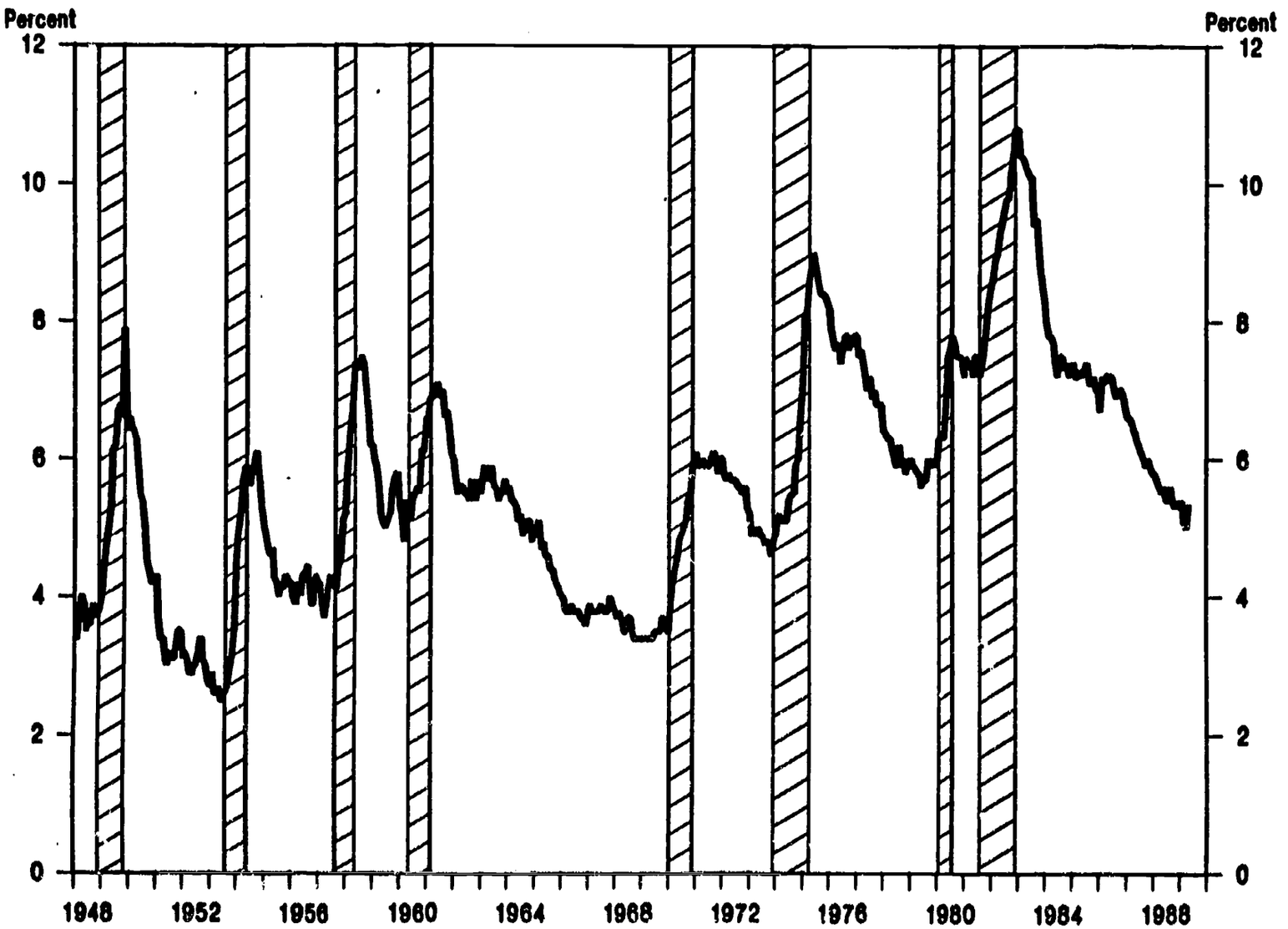
* As of this writing the recovery which began in 1982Q4 is still in progress.

Mn: Mining
Con: Construction
Mnf: Manufacturing
TPU: Transportation and Public Utilities
Trd: Trade
Fserv: Financial Services

Table 5. Comparison between business cycle peak and trough years of the percentage of newly unemployed groups remaining unemployed at least eight months

Peak Year	Percentage	Trough Year	Percentage
1969	2.1%	1971	4.2%
1973	3.0%	1975	7.2%
1979	3.6%	1982	8.0%
1988	2.8%		

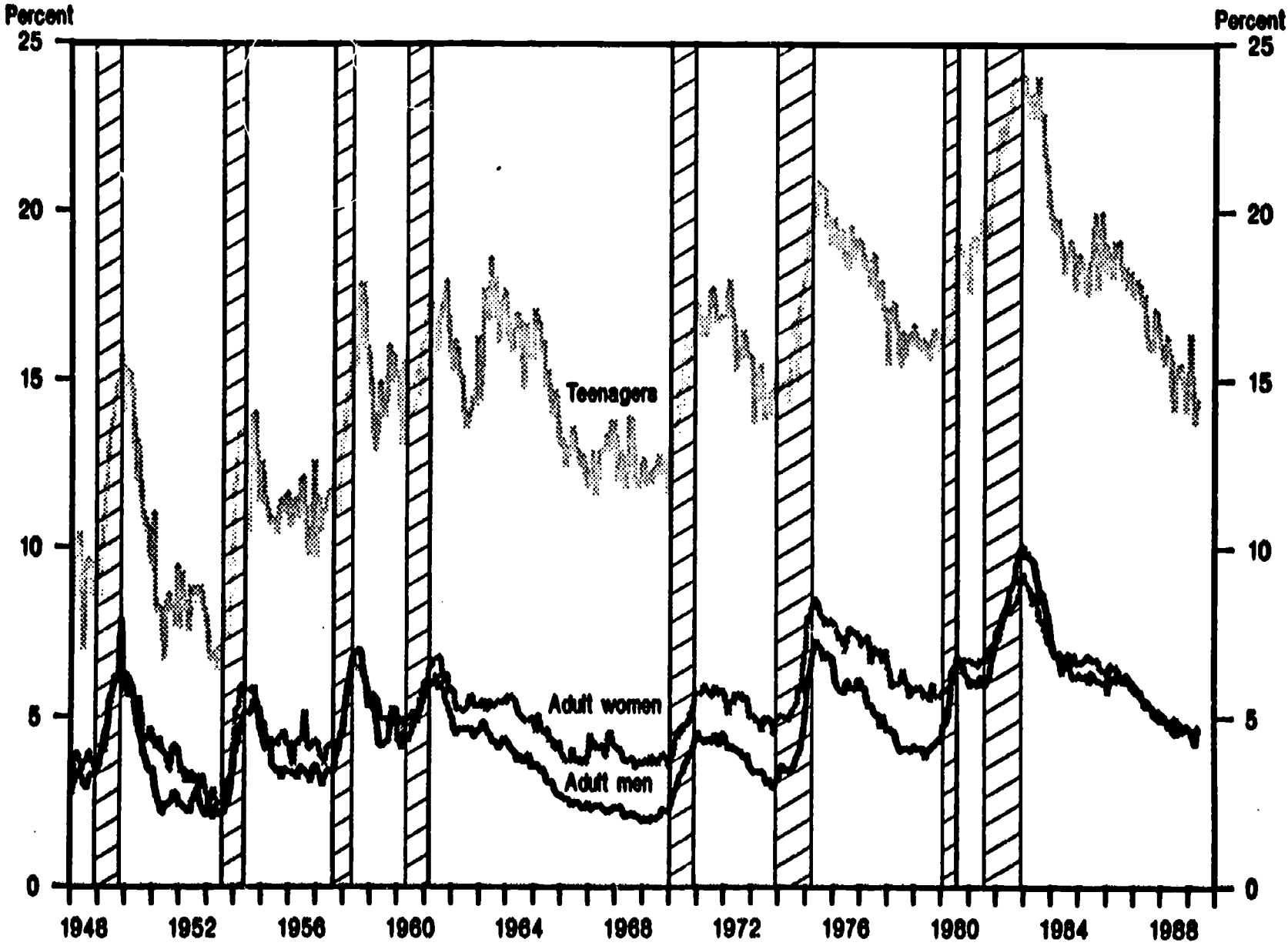
Chart 1. Unemployment rate of all civilian workers, seasonally adjusted, 1948–89



Note: Shaded areas represent recessions

Source: Bureau of Labor Statistics, May 31, 1989

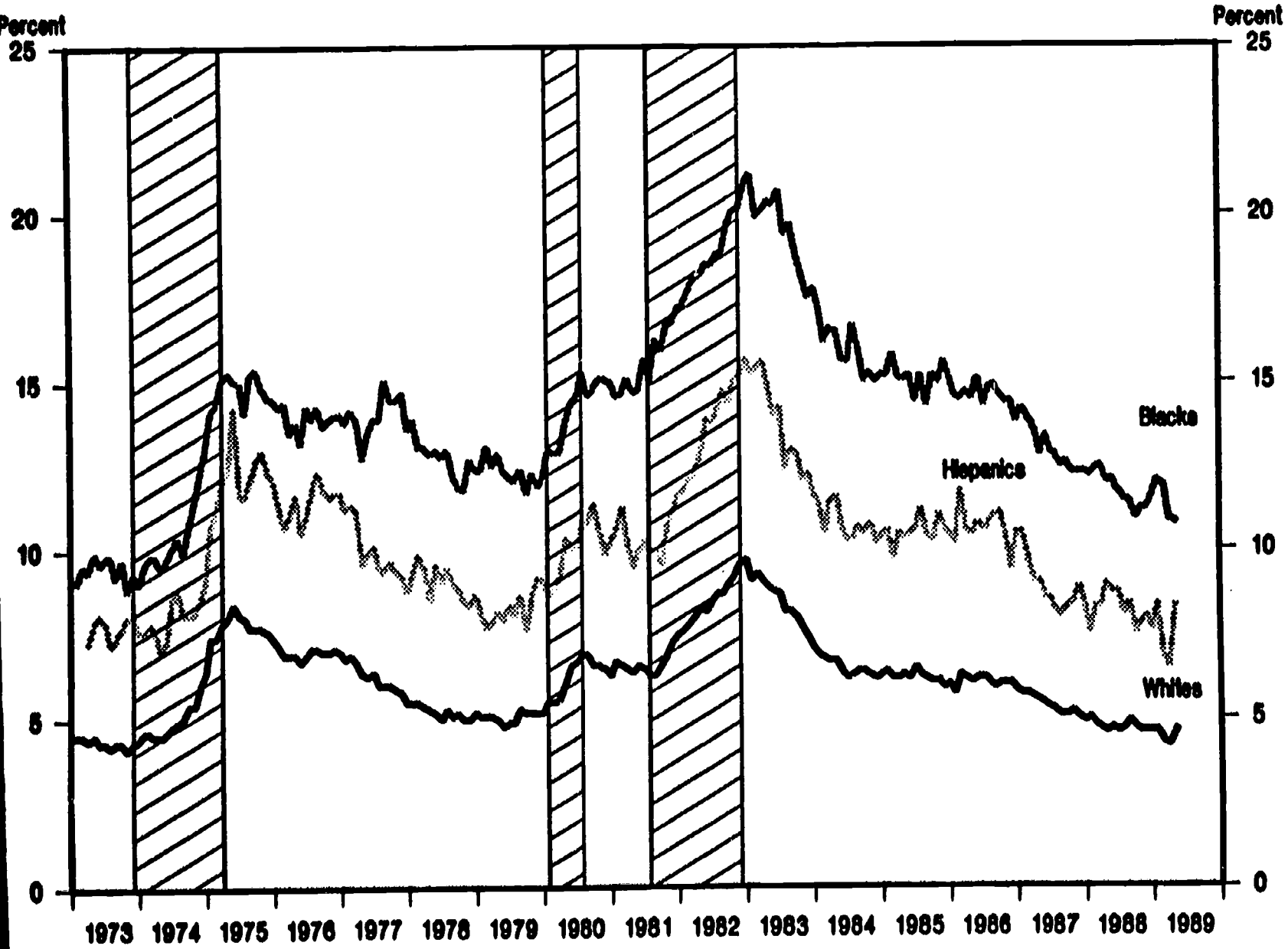
Chart 2. Unemployment rates for major age-sex groups, seasonally adjusted, 1948-89



Note: Shaded areas represent recessions

Source: Bureau of Labor Statistics, May 31, 1989

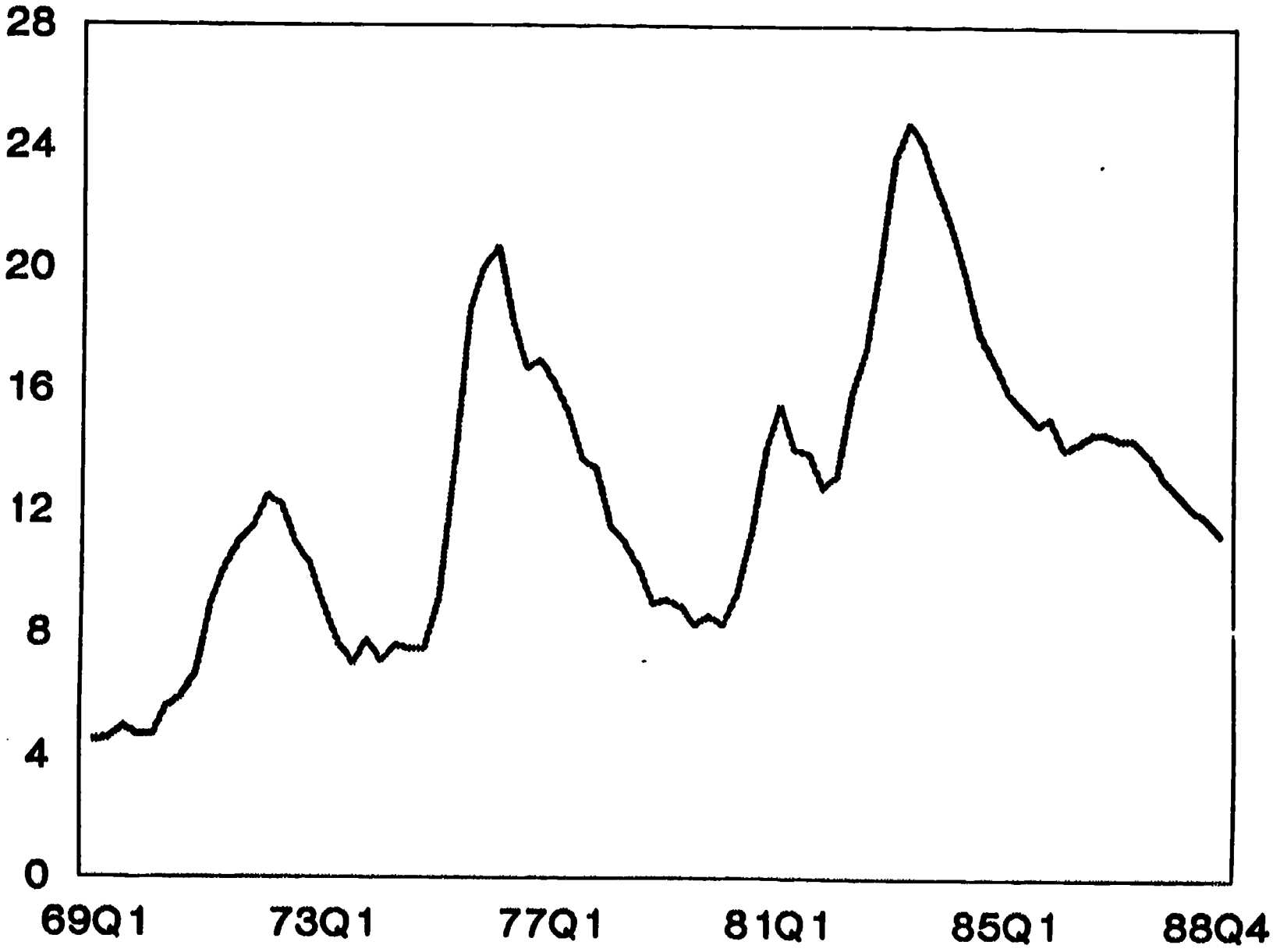
Chart 3. Unemployment rates for whites, blacks, and persons of Hispanic origin, seasonally adjusted, 1973–89



Note: Shaded areas represent recessions

Source: Bureau of Labor Statistics, May 31, 1989

Chart 4. Percentage of total unemployed with 27 weeks or more of unemployment, seasonally adjusted, quarterly averages, 1969Q1–1988Q4.



NOTES

1. This analysis ignores the recovery and recession of 1980-81 because of their extremely short duration.

2. An analysis of the changes in unemployment by region of the country was also conducted. Owing to the fact that the data on regions are not strictly comparable, the results by region are reported in note (3), along with a discussion of the data used in the analysis.

3. A division of the unemployed by region of the country shows that changing unemployment rates within regions, rather than shifting labor force shares between regions, accounts for practically all of the changes in overall unemployment rates during the 1969-88 period.

A potential problem with the data exists, however, owing to the fact that the population weights used in the data are inconsistent across the entire period. Data for 1969 are benchmarked to the 1960 Decennial Census; data for 1971, 1973, 1975, and 1979 are benchmarked to the 1970 Census; and data for 1982 and 1988 are benchmarked to the 1980 Census.

What is the effect of using inconsistent population weights? To gauge the potential bias, the following three statistics were calculated for each of the above mentioned years using the pattern of Census weights described above: the civilian noninstitutional population, civilian labor force, and the civilian unemployment level. A comparison was then made between the value of these statistics with ones derived for the same years using 1980 Census weights throughout.

As expected, the values of the statistics using inconsistent population weights underestimated the values derived using 1980 Census weights. However, a comparison of ratio statistics derived from the levels--namely, the unemployment rate and the labor force participation rate--reduces the bias to zero. This latter finding is supportive of the efficacy of using these data.

4. The formula for the decomposition approach is as follows:

Let Ut = the level of civilian unemployment at time t
Lt = the size of the civilian labor force at time t

For i = (1,...,N), let
Uit = the level of civilian unemployment in group 1 at t
Lit = the size of the civilian labor force in group i at t

For exposition purposes, let N=2 (for example, a stratification by sex). In this case, the aggregate unemployment rate equals:

$$Ut/Lt = (L1t/Lt) * (U1t/L1t) + (L2t/Lt) * (U2t/L2t)$$

This expression can be rewritten as:

$$URt = W1t * UR1t + W2t * UR2t$$

where:

URt = the aggregate unemployment rate at time t
Wit = the civilian labor force share of group i at t
URt = the unemployment rate of group i at t

Let the t' subscript be used to denote the value of these variables at time t'. The change in unemployment rates between time t and t' can be expressed as the sum of the following three terms:

$$(URt'-URt) = \Sigma\ URit * (Wit' - Wit)$$

$$+ \Sigma\ Wit * (URit' - URit)$$

$$+ \Sigma\ (Wit' - Wit) * (URit' - URit)$$

The first term measures the change in unemployment rates due to the changing labor force shares across groups, holding the unemployment rate of each group constant at its value in time t. The second term measures the change in unemployment rates due to changing group unemployment rates, holding the civilian labor force of each group constant at its value in time t. The final term is a measure of the covariance of the two effects of changing group labor force shares and changing group unemployment rates. It is often called the error term and is usually small in size. We report the error term in this paper.

5. Finally, a decomposition of the unemployed into age-sex groups was also conducted, although not reported in the tables. The results for this finer group stratification mirror the pattern found using a simple age decomposition.

6. Although not reported in the tables, the analysis by reason for unemployment was repeated for male and female groups. Owing to the fact that such data are not seasonally adjusted, annual average values were used. Comparing "low" unemployment rate years in successive recoveries (1969, 1973, and 1979) as well as the "high" rate ones in successive recessions (1971, 1975, and 1982), job losers of both sexes, reentrant women, and to a lesser extent, new female entrants each posted significant increases in their contribution to secularly rising unemployment rates over the period.

7. Using published groupings of weeks unemployed, the following classifications were adopted: newly unemployed (less than 5 weeks of unemployment); short-term unemployed (5-14 weeks); medium-term unemployed (15-26 weeks); and long-term unemployed (27 weeks or longer).

8. What is not depicted in the chart are the broad trends for the other three groups: over the 1969-88 period, the proportion of the unemployed in new spells declined secularly; the proportion in short-term spells remained flat; and medium-term spells increased their proportionate share slightly.

9. Similar to the conclusions reached in this paper, their work finds that the "secular increase in unemployment in the U.S. is surprisingly evenly distributed across subcategories of the labor force, including industries, regions and demographic groups."

10. For example, consider the following scenario. As inflows into unemployment increase, it is possible for two effects to operate. First, most individuals entering unemployment leave fairly quickly, while at the same time, a small but significant group of people experience much longer spells of unemployment. Under this interpretation, it is possible that the shift toward long-term unemployment has been the result of an increase in the length of time this proportionately small group of people remain unemployed - while most individuals still remain unemployed a short period of time.

11. This calculation is based on unpublished data from the Current Population Survey which provides monthly information on duration by single weeks of unemployment. The size of a newly unemployed group at survey date t was proxied by the number of individuals reporting less than five weeks of unemployment at date t. The size of this group five months later was proxied by the number of individuals reporting anywhere from 17 to 20 weeks of unemployment at survey date t+4. The size of the group at survey date t+7 was proxied by the number of individuals reporting 29-32 weeks at this latter date.

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