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Chapter Author: Geoffrey H. Moore

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Chapter 7

Presenting Employment and Unemployment Statistics in a Business Cycle Context

SUMMARY

"Last year was a good one for the United States. We reached all of our major economic goals for 1977. Four million new jobs were created—an all-time record—and the number of unemployed dropped by more than a million. Unemployment right now is the lowest it has been since 1974, and not since World War II has such a high percentage of American people been employed."[1] These are the words of President Carter, in his first State of the Union message, delivered January 20, 1978. For balance, clarity, and succinctness the statement cannot be faulted. It is a fitting text for some suggestions aimed at improving the presentation of employment and unemployment statistics.

I shall first summarize my recommendations and then explain and elaborate the arguments for each of them.

1. The Bureau of Labor Statistics should publish and emphasize in its press releases and articles the percentage of the working age population that is employed, the percentage unemployed, the percentage in the armed forces, and the percentage not in the labor force. These figures, which add to 100 percent, should be shown not only for the total working age population, but also for each major age, sex, and racial group and for various geographic areas.

2. The Bureau of Labor Statistics should publish a monthly chartbook of employment and unemployment statistics and a companion yearbook that would facilitate interpretation of current information. It might be called *Employment Conditions Digest* (*ECD*).

3. The Bureau of Labor Statistics should present and analyze leading, coincident, and lagging labor market indicators, including an analysis of the economic rationale underlying their behavior and a historical record. These should be included in *ECD*.

4. To aid in appraising the state of the economy, the Bureau of Labor Statistics should publish comparisons of current changes in employment and unemployment with corresponding changes during earlier periods of recession or recovery, as the case may be. These also should be included in *ECD*.

5. The Bureau of Labor Statistics should develop a number of readily available statistical series that are needed to facilitate analysis of the employment situation and should also develop a monthly statistical report on the number and kind of job vacancies that are available.

6. A continuing audit of employment statistics, conducted by an authoritative agency or group such as the National Research Council, should be established to follow up the recommendations of the present commission and to advise on the needs for new data and on problems concerning existing data as they emerge in the years ahead.

EMPLOYMENT AND UNEMPLOYMENT RATES

As President Carter's State of the Union message illustrates, employment and unemployment do not change at the same pace. During 1977 an unprecedented number of new jobs were created—four million—but unemployment was reduced by only one million, not an unprecedented decline at all.[2] The percentage of the population with jobs reached a peacetime high, but unemployment receded only to the level of 1974, when the economy was still in recession. Thus the employment and unemployment figures can point to different conclusions about the state of the economy.

The most widely used figure pertaining to the unemployment situation—which interestingly enough the President did not mention—is the unemployment rate. This is the percentage of the labor force that is unemployed. The figure for December 1977 was 6.4 percent, after seasonal adjustment. Since the labor force is the sum total of the employed and the unemployed, the employment rate, on this base, is simply the complement of the unemployment rate—93.6 percent in December, seasonally adjusted. No new information is added by this

employment rate—its movements are always exactly equal and oppo-site to those of the unemployment rate.

The unemployment rate is unquestionably a useful statistic. Over a long period of time, as the population grows, the number employed and unemployed grow with it more or less, so that in comparing un-employment with some earlier period one needs to take this growth into account. The question is whether using the labor force as the base is the best way to do it. Can another way be found that would preserve some of the information about employment that is lost when the labor force is used as the base?

The answer carries with it some important advantages. An appro-priate base is the population of working age. This obviously is the most direct way to take account of the growth in population. Ignoring those under sixteen years of age is reasonable, since in many instances these children are below the legal working age. Perhaps some upper age limit should be used also, but that is a far more con-troversial matter, since people can be found working at almost any age. For example, in December 1977, 1.2 million persons seventy years and over were employed, or about 8 percent of the population of that age; 40,000 were unemployed. One cannot, therefore, omit this age group (which is the top age group reported in the statistics) without omitting some of the employed and some of the unem-ployed. One might also omit the armed forces—that is, include only the civilian population in the base. However, since for some purposes it is desirable to consider those in the armed forces as employed, and in any case a marked change in their number, as in wartime, will affect civilian employment and unemployment, it seems best to in-clude them in the population base and to calculate the percentage that each group—employed, unemployed, armed forces, and not in the labor force—constitutes of the total. All these percentages would then be on the same base and hence comparable with one another, and they can be combined or compared as one wishes.

This simple shift in the base—from labor force to total working age population—has a number of important effects. Probably the most important is that it allows the employment and unemployment percentages to move independently of one another. Most of the time they will move in opposite directions, the percentage employed rising and the percentage unemployed falling, or vice versa, but sometimes the percentage employed will rise and the percentage unemployed will rise also, which forces one to consider the question whether things are getting better or getting worse on grounds other than arithmetic.

Consider, for example, Table 7—1, which compares the situation in March 1978, the thirty-sixth month of the recovery that began in March 1975, with the situation in the corresponding months of the five preceding recoveries that lasted as long as thirty-six months. A number of interesting points emerge: (1) the percentage employed was higher in March 1978 than in the corresponding month of any of the previous recoveries; (2) the percentage in the armed forces was smaller than in any previous recovery; (3) the percentage unemployed was higher than in any previous recovery (having increased rather steadily from one recovery period to the next); and (4) the percentage outside the labor force was smaller than in any previous recovery.

Considering unemployment alone, the current recovery has been the least auspicious of the five. In fact, the unemployment figures suggest that recoveries have become steadily weaker ever since 1949. The employment figures do not show any such trend. According to them, the current recovery is the best ever by a full percentage point, which at present population levels means about 1.5 million people. That is, if the current recovery had merely equaled rather than exceeded the previous record, a million and a half fewer people would have been employed than actually were employed in March 1978. This is surely important information, and it would be completely obscured if one looked solely at the unemployment rates or at their obverse, employment rates calculated as a percentage of the labor force.

The steady reduction in the percentage of the population engaged in the armed forces raises the question what effect this reduction has had upon employment and unemployment. The figures do not answer this question, of course, but they do show that if the armed forces are counted together with the civilian employed, the March 1978 employment percentage is still the highest.

Finally, the current low percentage of the working age population not in the labor force suggests that many of those previously outside the labor force have now entered it, which implies that this group constitutes a kind of reserve labor force. While many of those not in the labor force are unable to work for various reasons (family responsibilities, school attendance, or illness), others report that they both want and intend to seek work in the near future or would do so if the job market improves. The fact that the proportion of the working age population not in the labor force has become smaller means that shifts do take place and that this group includes many potential employees. The reduction in this secondary labor reserve has, therefore, offset in some respects the rise in the unemployed, the primary labor reserve. Some of those who previously reported that they were

Table 7-1. Distribution of the Working Age Population in the Thirty-sixth Month of Five Recovery Periods.

Thirty-sixth Month of Recovery	*Percentage Distribution of the Population Sixteen and Older*					Number of Persons Sixteen and Older
	Civilian Employed	Armed Forces	Unem-ployed	Not in Labor Force	Total	
March 1978	58.2	1.3	3.8	36.7	100.0	160,313,000
November 1973	57.3	1.5	2.9	38.3	100.0	149,208,000
February 1964	54.4	2.2	3.1	40.4	100.0	126,440,000
May 1957	55.7	2.5	2.4	39.5	100.0	114,851,000
October 1952	55.1	3.3	1.7	40.0	100.0	109,164,000

Note: A sixth recovery period, beginning April 1958, lasted only twenty-four months and hence is omitted. The un-
employment percentages shown above are much lower than the unemployment rates commonly used because the latter
are percentages of the civilian labor force (employed plus unemployed) rather than of the total working age population.
Otherwise they show much the same pattern. Starting with March 1978, the unemployment rates in the five recoveries
are 6.1 percent, 4.8 percent, 5.4 percent, 4.1 percent, 3 percent.

Source: U.S. Bureau of Labor Statistics.

not seeking work are now doing so, shifting from the secondary to the primary reserve. Other former secondary reserve members have found jobs and are counted as employed. Under these circumstances, the unemployment rate does not accurately measure the tightness or ease in the labor market. Changes in the secondary labor reserve must also be considered. A reduction in this secondary reserve clearly affects the economy's capacity to expand employment. Hence it is important to take it into account when considering the subject of wage and price inflation.[3]

These observations demonstrate some of the analytical advantages of using the working age population as the base for an employment rate and an unemployment rate. It keeps the employment side of the picture in plain sight, with the rates comparable because they are figured on the same base, but not redundant because they are free to move independently. It does not, in my view, denigrate the unemployed, though it does make the percentage smaller, since the population is larger than the labor force. This simply means that a "high unemployment rate" will mean a figure of 4 or 5 percent rather than 7 or 8 percent, and a "low unemployment rate" will mean a figure of 2 or 2.5 percent rather than 3 or 4 percent.

Several other advantages attach to the use of the population base. One is that the population, as estimated, grows quite steadily from month to month and year to year, much more steadily than the labor force. Consider the month to month changes in both during 1977, as given in Table 7−2. Obviously, the labor force fluctuated far more widely than the population. Since it is also a smaller number, the differences in the relative fluctuations are even wider. This simply means that the labor force is an unstable base upon which to calculate rates. One reason for this is that the labor force, being the sum of the employed and the unemployed, is subject to the sampling fluctuations inherent in a survey. The population is largely an extrapolated estimate, not subject to sampling error. Another reason is that the labor force is subject to the uncertainty of identifying who is employed and who is unemployed. There is much less uncertainty about who is in the population.

The labor force columns in Table 7−2 point to another advantage of the population base—it doesn't have to be seasonally adjusted. Without seasonal adjustment the labor force would, of course, fluctuate even more widely, but since there is an inherent uncertainty in the measurement of seasonal variations, the adjusted figures are subject to this additional source of error. Each year, for example, the seasonally adjusted figures for the preceding year are revised. The fluctuations in the labor force as estimated during 1977 were differ-

Table 7-2. Changes in Labor Force and Population, 1977.

	Civilian Labor Force, Seasonally Adjusted		Population
	A	*B*	
January	-444	-217	205
February	629	601	203
March	394	303	198
April	221	123	204
May	398	415	242
June	483	391	228
July	-336	-245	226
August	392	307	217
September	171	142	215
October	234	315	220
November	896	806	188
December	-72	42	214

Change from Preceding Month (thousands of persons)

A = before revision of seasonal factors in January 1978.
B = after revision of seasonal factors in January 1978.
Source: Bureau of Labor Statistics.

ent from what they were when reestimated in January 1978 (see A and B in table). These revisions are one source of revision in the unemployment rate as presently calculated—on the labor force base. The population figures, which are estimated in such a way as to exclude seasonal variations, are not subject to such revision.

Of course, since the seasonal in unemployment itself is subject to revision, the use of the population as the base for the unemployment rate does not eliminate revisions entirely. But it does not compound the problem by mixing it up with revisions in the seasonal for employment (the other component of the labor force). In this connection it should be noted that the revisions in the seasonal adjustment of employment data are usually smaller than those for unemployment. Hence the revisions in the percentage of the population that is employed are likely to be smaller than those in the percentage that is unemployed. The revisions made in January 1978 covering the preceding year provide a clear example of this point. The revisions in the seasonally adjusted number employed were smaller than those in the number unemployed in ten of the twelve months of 1977. The unemployment percentage was revised twice as frequently as the

employment percentage. Moreover, the revisions of the unemploy-
ment figures changed the pattern during the year from near stability
to rather steady improvement; the revisions of the employment
figures had no such effect. They showed steady improvement
throughout the year, apart from a slowdown in July and August,
both before and after revision.[4]

The working age population not only provides a firm statistical
base upon which to calculate employment and unemployment rates;
it is also readily understood by the public, far more so than the labor
force concept. "Jobs per capita," which is essentially what the per-
centage employed is, can be readily understood by everyone. The
statement that in June 1978, fifty-nine persons out of a hundred had
jobs, four were unemployed, one was in the armed forces, and thirty-
six were neither employed nor seeking work tells a simple but effec-
tive story. The improvement since the bottom of the recession, in
March 1975, when only fifty-five had jobs, five were unemployed,
one was in the armed forces, and thirty-nine were neither employed
nor seeking work is equally clear. Comparisons with previous periods
of high employment are more ambiguous, but the ambiguity is in the
situation, not in the complexity of the figures. In one of the most
prosperous years of 1950s, for example, fifty-five had jobs, two were
unemployed, three were in the armed forces, and forty were neither
employed nor seeking work. This was in 1953, when the unemploy-
ment rate was about half the 1978 figure. Relative to the population,
however, more people have jobs now than then. The difference is
that more are now unemployed—that is, seeking work—and fewer
are neither employed nor seeking work. The rise in unemployment
has not come about through a fall in employment, and that makes
the situation very different than if it had. The set of percentages rec-
ommended for attention here reveals the difference.

Although the nation as a whole has recently achieved a higher per-
centage employed than at any time since World War II, there is no
reason to regard this as a maximum. It is instructive to look at some
areas of the country where the number of jobs per capita is higher
than for the country as a whole. The Bureau of Labor Statistics has
published employment-population ratios for thirty large metropoli-
tan areas for 1976, together with unemployment rates (labor force
based). Compared with a national employment ratio of 56.8 percent
in that year, the five cities with the highest ratios ranged from 64.6
percent in Dallas to 65.3 percent in Denver. In those same cities the
unemployment rate ranged from 4.6 percent to 6.5 percent, well
below the national unemployment rate of 7.7 percent in 1976. Care-
ful study of these and other geographical data (for example, by

states) might provide valuable information on the conditions that are conducive to a higher national employment ratio and a lower unemployment rate.

The Bureau of Labor Statistics should also be encouraged to give prominent emphasis to both the employment and the unemployment percentages of the working age population for different age, sex, and racial groups. It is not widely known, for example, that in 1978 the percentage of adult women who were employed was higher than at any time since 1947 and that the percentage of teenagers who were employed also reached a record high. This situation is not disclosed by the unemployment rates, which for both groups were at relatively high levels in 1978. It reflects a much more favorable situation than if their relatively high unemployment rates had been accompanied by low employment percentages, as might be expected to happen during a recession. The high unemployment rates for women and teenagers give the impression that job opportunities for them are scarce; but the unusually high employment percentages tell us that this is not so. This does not imply that efforts to improve the access of women and teenagers to jobs should be relaxed. It does imply that the nature of the problem is different from what it would be if their employment percentages were low and declining, as they were during the 1973–1975 recession.

To take another example, although the unemployment rates for both whites and blacks in 1978 were higher than they were in 1973, at the peak of the previous business cycle, this information does not reveal that the percentage of whites employed in 1978 was considerably higher than it was at the earlier peak, while for blacks it was lower. Thus for whites the situation is mixed: more unemployed, but also more employed. But for blacks the situation is worse on both counts: more are unemployed, and fewer are employed.

Although the Bureau of Labor Statistics has taken some useful steps to provide the information described above, it should in my view be encouraged to go farther than it has, in the directions indicated.

A NEW REPORT: EMPLOYMENT
CONDITIONS DIGEST

In any large statistical agency such as the Bureau of Labor Statistics, which produces figures that are avidly sought by a wide variety of users every month, there is a tendency to gear up to the essential task of getting the figures out promptly and accurately and describing their movements compared with the last month or year, but not

to take the time to consider how to facilitate their use in a longer perspective. One of the best ways to do this is with charts, and the bureau has pioneered in the production of computer-plotted charts in its press releases, in *Employment and Earnings*, in the *Chartbook on Prices, Wages, and Productivity*, and in *Employment, Hours and Earnings: A Graphical Analysis.* This last document is a forty-page chartbook, issued on the same day as the current month's figures are released and covering the last ten years by months. For timeliness it has, to my knowledge, no equal, but it is not a regular publication of the bureau, and hence its circulation is limited.

The development of this document into a published chartbook, with little or no sacrifice of timeliness, would be a worthwhile enterprise, albeit a major one. It could become an *Employment Conditions Digest* (or *Labor Conditions Digest*), corresponding to the *Business Conditions Digest* of the Department of Commerce. The latter has made economic indicator information far more accessible to users, giving them a historical perspective, a wide range of data, and an analytical arrangement focused on current interpretation. *ECD* could do the same with respect to employment, unemployment, and related labor activities.

The chief features of the proposed *ECD*, as I see them, would be as follows:

1. Charts to cover a twenty-five year time horizon, showing monthly seasonally adjusted data. An alternative would be to cover twenty-five years for the principal series and ten years for others, since this would permit reproduction of more series in the same space.

One of the incidental but not unimportant advantages of such charts is that they could be reproduced for other purposes, either by the BLS for presentation before congressional committees or other audiences or by users themselves. There is a need for visual presentation of employment and unemployment data before large audiences, such as those generated by TV newscasts, newspapers, and news magazines. Many charts that are constructed hastily by people who do not know much about the subject matter are unintentionally misleading. The reproduction of charts from *ECD* could therefore serve a significant educational purpose, especially if those charts that are likely to be in most demand were designed with this end in view. One particular use that could be facilitated would be to design charts that give national figures in such a way that comparable charts could be prepared with state or local area data. Comparison of the local picture with the national is often a useful way to give perspective, and

the needs for local employment information have become so great that this kind of graphic presentation should be given careful attention.

2. Arrangement principally by subject, without regard to source of data (e.g., household survey, establishment survey, or other sources). An arrangement of selected series by cyclical timing should be given separately, and comparisons of the current recovery (or recession) with previous recoveries (or recessions) should also be shown, as discussed later in this chapter. The proposed content of the report is as follows:

a. Employment:

Number employed, percent of population, aggregate hours, new hire rates, diffusion indexes.

By age, sex, race, occupation, industry, state or region.

Help-wanted advertising (Conference Board) and anticipated employment changes (Dun & Bradstreet) should be included.

b. Unemployment:

Number unemployed, percent of population, percent of labor force.

By age, sex, race, occupation, reasons, duration, family relationship, industry, state or region.

Initial claims and insured unemployment should be included, as well as layoff and quit rates.

c. Hours of work:

Average workweek, overtime hours, full-time and part-time employment.

By industry, including diffusion indexes.

d. Persons not in the labor force:

Number, percent of population.

By age, sex, race, reasons for not seeking work, intentions to to seek work, work experience.

e. Leading, coincident, and lagging indicators of employment conditions (see below).

f. Recovery comparisons (see below).

g. International employment conditions:

Employment and unemployment series for the major industrial countries (presently compiled by BLS).

3. Business cycle shading should be a standard feature of the charts. Many users find this device helpful in reminding them when recessions occurred and what happened then, whether or not they use the business cycle chronology in any analytical way. In addition, a section of *ECD* should be devoted to charts comparing the current recovery (or recession, as the case may be) with earlier recoveries (see below).

4. Tables of monthly figures should be included in *ECD*, covering the last three years, together with annual averages for, say, five years. It is highly important to give the monthly data with the charts, so that current figures can be identified easily, recent trends studied with care, new figures added if they become available between publication dates, and so forth. The monthly tables should include breakdowns of totals or of ratios given in the charts, since the breakdowns help to explain movements in the totals or ratios but may not be important enough to chart. Highly detailed breakdowns should, of course, be left to *Employment and Earnings*.

5. Historical monthly data back to 1947 for the same series covered in *ECD* should be made available once a year, either in appendixes to *ECD* or in a yearbook. The *Handbook of Labor Statistics* does not do this nor does *Employment and Earnings*. Probably *Employment and Earnings* would be the best place for this historical supplement of monthly data, but it should be clearly distinguished from the rest of the data, so that users can readily find the series that are shown in *ECD*. These series should be identified by numbers in the charts, in the current monthly tables, and in the historical monthly tables. An index in *ECD* should give the series titles, identification numbers, and page references showing where charts, monthly tables, historical tables, and series descriptions can be found.

6. *ECD* should contain a standard introductory section patterned after the "Notes on Current Labor Statistics" in the *Monthly Labor Review*. It should include a schedule of future release dates for the series shown in *ECD*, so that the user can bring series up to date prior to the next issue. The notes should cover the household survey, establishment survey, unemployment insurance data, and such privately compiled series as are included. References to sources of more detailed data or fuller descriptions should be given.

7. It would be useful, in each issue of *ECD*, to include the report on employment conditions prepared each month by the Commissioner of Labor Statistics for presentation to the Joint Economic Committee. This gives a brief interpretation of the current month's data and would be helpful to users of *ECD*.

Since the development of a publication such as *ECD* would be a major undertaking, it should probably start out on modest lines, with new features added as time goes on. It would be highly important not to let the publication process defeat the timeliness feature, since it is frustrating to users to receive a publication that does not contain data that have already been issued by the same agency. Since the employment data are nearly all released on the same date, the publication should be in the hands of users shortly after that release date and well before the next release date.

Some of the resources now devoted to other BLS publications could be devoted to *ECD. Employment, Hours and Earnings: A Graphical Analysis* would of course be completely replaced, and the charts in *Employment and Earnings* would be discontinued. The current labor statistics section of the *Monthly Labor Review*, which now covers nearly forty pages, might be reduced to around ten and still give representative coverage of the principal BLS series for the convenience of *MLR* readers. This would also provide more space for the types of analytical articles proposed in the next section.

LEADING, COINCIDENT, AND LAGGING LABOR MARKET INDICATORS

Students of business cycles have long recognized that recessions and recoveries do not affect all aspects of the labor market at the same time. The average workweek in manufacturing was identified as a leading indicator in 1937 in a study by Wesley C. Mitchell and Arthur F. Burns for the National Bureau of Economic Research and has remained on the list of selected leading indicators ever since. In many industries it is reasonable to expect that employers will change the length of the workweek more promptly than they will change the number of employees at work. While overtime work costs more, there is no long-term commitment, and the decision is easily reversed. Hence the average workweek is a leading indicator vis-à-vis the number of persons employed.

Similarly, there are good reasons to expect that the unemployment rate will start to rise before the number employed turns down in a recession, because slower growth in the number employed often precedes a decline, in which case the advance in employment may not keep up with the steadily rising population and labor force. Experience bears out this supposition. On the other hand, a decline in the unemployment rate is not likely to begin until some months after the pickup in employment begins, because the pickup may be slower

at first than the continuing rise in the population and labor force. Thus unemployment is often a leading indicator at downturns in the business cycle, but a lagging indicator at upturns.

Again, one might expect the number of people unemployed for a long time, say fifteen weeks or more, to lag behind the turns in the total number of unemployed, since the rest have only recently become unemployed, and there is an obvious lapse of time involved before anyone can be classified as having been unemployed for fifteen weeks. Moreover, the recently unemployed are on the whole more likely to be recalled to work before those who have been seeking work for a long time without success. Long duration unemployment, therefore, is a lagging indicator.

Knowledge of these timing relationships is useful in understanding the movements in employment and unemployment and in anticipating what is likely to happen next. A classification of the chief labor market series into leading, coincident, and lagging groups, along the lines carried out in *Business Conditions Digest*, together with the historical record of leads and lags and an analytical statement explaining these relationships, would be helpful to the users of the data. To illustrate such a record, consider Table 7–3, which shows the leads of the average workweek in manufacturing industries at turns in employment and unemployment (see also Chapter 22).

Table 7–3.   Workweek Turns Before Employment or Unemployment.

Dates of Cyclical Troughs			Lead (−) or Lag (+), in Months of Workweek versus	
Average Workweek, Manufacturing	Nonfarm Employ-ment	Unemploy-ment Rate, Inverted	Employ-ment	Unemploy-ment
4/49	10/49	10/49	−6	−6
4/54	8/54	9/54	−4	−5
4/58	5/58	7/58	−1	−3
12/60	2/61	5/61	−2	−5
9/70	11/70	8/71	−2	−11
3/75	6/75	5/75	−3	−2
Dates of Cyclical Peaks				
12/47	9/48	1/48	−9	−1
4/53	4/53	6/53	0	−2
11/55	3/57	3/57	−16	−16
5/59	4/60	2/60	−11	−9
10/68	3/70	5/69	−17	−7
4/73	9/74	10/73	−17	−6

Source: U.S. Bureau of Labor Statistics.

   Charts of the early moving and later moving indicators of labor activity should be included in a section of proposed *Employment Conditions Digest*. At the same time, a report on the historical record and the rationale underlying it should be prepared and published.

RECESSION AND RECOVERY PATTERNS

One of the more widely used devices for measuring the state of the economic recovery that began in 1975 is to compare it with changes over corresponding periods during previous recoveries. A comparative picture of the relative strength or weakness of the current recovery, and of any unusual features that develop, is readily obtained by this device. Julius Shiskin, former Commissioner of Labor Statistics, used it frequently in presentations before the Joint Economic Committee, and comparisons of this type have been made in the *Economic Report of the President*, in news magazines and newspapers, and in many privately published reports and presentations. The comparisons have, of course, not been limited to employment and unemployment data, but have covered production, retail sales, capital investment, prices, profits, and other economic variables.

   The record of what typically happens during periods of economic recovery from recessions is not widely known. There is often a long lag in public recognition even of the fact that a recovery is taking place. How far along it is at any point, what has happened in the later stages of previous recoveries (especially the developments that have helped to bring them to an end), and what factors appear to be especially strong or weak in the light of past experience are matters on which greater public enlightenment would be desirable. The same can be said of recessions, and the same comparative device can be and has been used during recessions.

   To do this effectively, advance preparation and study of the historical record is essential. The BLS has been undertaking some of the preparatory analysis.[5] It should be encouraged to do this with respect to all the various types of data that it is responsible for (employment, prices, wages, productivity) and to publish the results so that they may be used by others.

   Charts showing recovery patterns for the principal employment, unemployment, and hours of work series should appear in a separate section of the proposed *Employment Conditions Digest*, together with the relevant tabular material. From time to time analytical reports on the results should be issued. Similar provisions should be made in the event of a recession.

It is highly desirable that such charts be kept as simple as possible. The charts currently published in *The Conference Board Statistical Bulletin* are good examples of an effective way to do this (see Figure 7–1). The current expansion, starting from the low point of the business cycle in March 1975, is compared with the average of the five preceding expansions starting from their respective low points. The unemployment rate has persisted at a much higher level during the current expansion than in the previous expansions, but it has been declining at about the same pace as in the previous expansions. Nonfarm employment rose more slowly during the first two years than average experience during previous expansions indicated, but it caught up in the third year.

DEVELOPMENT OF NEW DATA

The development of new data on employment and unemployment is, of course, a topic warranting the most careful consideration. My discussion is limited to types of data that are not altogether new, but that are especially needed for improved presentation and analysis. One recommendation of this sort has been made earlier in this chapter—namely, the publication of employment, unemployment, and not in the labor force data as percentages of the total population of working age. Five additional recommendations follow.

Household versus Payroll Survey
A reconciliation between the employment figures as derived from the household survey and from the establishment (payroll) survey should be published currently. Many users do not know what the conceptual differences are or how to go about eliminating them from the published totals. The published household survey figure for nonfarm employment is much larger than the payroll survey figure, but it becomes smaller than the payroll survey figure when definitional differences are removed. A major reason for the remaining difference is that the payroll survey counts persons with more than one job more than once (if they appear on different payrolls), whereas they are counted only once in the household survey. These differences are, of course, well known to the BLS staff, and articles about them have been written from time to time.[6] But such articles are not widely read or easy to locate. Regular publication of a simple reconciliation table in the BLS press release and a more detailed table in *Employment and Earnings* would increase public awareness of the differences between the two surveys and their relative strengths and weaknesses.[7]

Figure 7–1. Tracking the Economic Expansion *(all data seasonally adjusted).*
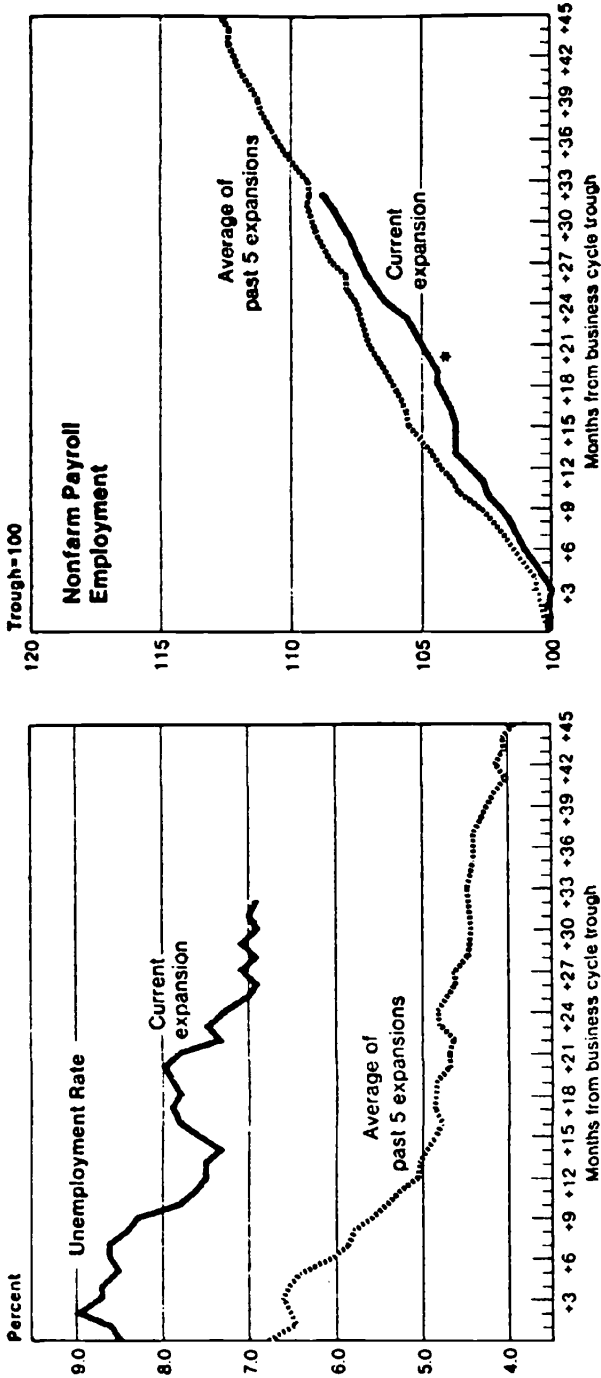
Note: Cycle trough dates (month, quarter): 1949 October, IV; 1954 May, II; 1958 April, II; 1961 February, I; 1970 November, IV; 1975 March, I.

*Denotes point in current expansion at which the series passed its prerecession peak.

Source: The Conference Board Statistical Bulletin, January 1978, p. 16.

An example of a partial reconciliation, based upon published sea-
sonally adjusted totals, is in Table 7−4. The household survey figures
for total civilian employment are larger than the payroll figures for
nonfarm employment by eight or nine million, and the increase dur-
ing 1977 was more than one million larger according to the house-
hold survey. But when the household survey figures are adjusted to
exclude agricultural workers, the self-employed, and unpaid family
workers, the figures become smaller than the payroll figures, and the
difference in growth during the year is reduced to 600,000. Some
further adjustments can be made from unpublished data to render
the surveys more comparable in coverage, as indicated in the table's
footnotes. The difference due to multiple job counting in the estab-
lishment survey can be approximated from the household survey
data, however, only once a year (in May), when persons working on
their second job as a nonagricultural wage and salary worker are
counted. In May 1977 there were 2.9 million such people. A major
step toward better reconciliation of the current figures, therefore,
could be taken if this question were asked every month. Some fur-
ther steps are suggested below.

Industry Employment

Although the BLS publishes monthly seasonally adjusted unem-
ployment rates for a number of major industries, by classifying peo-

Table 7−4.   Partial Reconciliation of Employment Figures from Household
and Payroll Surveys *(seasonally adjusted data, in thousands).*

	December 1976	December 1977	Change
1. Total civilian employment, sixteen and over, household survey	88,441	92,589	+4148
2. Less: agricultural workers	3,257	3,331	+74
self-employed, nonfarm	5,798	6,197	+399
unpaid family workers, nonfarm	460	438	−22
3. Equals: nonfarm wage and salary workers, household survey [a]	78,926	82,623	+3697
4. Nonfarm employment, payroll survey [b]	80,370	83,439	+3069

[a] Includes private household workers and workers absent without pay (due to
bad weather or industrial dispute), who are not included in payroll survey.

[b] Includes fourteen and fifteen year olds, who are excluded from the household
surveys, and agricultural service workers, who are counted as agricultural workers
in the household survey. Persons with more than one job may be counted more
than once in the payroll survey, but only once in the household survey.

Source: U.S. Bureau of Labor Statistics.

ple according to their last full-time job, monthly seasonally adjusted employment data for the same industries from the household survey are not published. In analyzing changes in total employment, therefore, it is not possible to determine readily what industries are supplying the jobs. Such information is, of course, provided by the establishment survey, and this is one of its major functions. But as we have seen, the establishment survey data do not reconcile fully with the household survey data and therefore cannot be used directly to account for movements in the latter.

Hence a twofold function would be served by regular publication of monthly seasonally adjusted employment data by major industry from the household survey. First, it would permit analysis of the industries in which employment is growing or declining. The unemployment figures, by industry of last job, do this only indirectly, and not accurately, because workers do not remain indefinitely in the same industry. For example, between December 1976 and December 1977 unemployment in the finance and service industries fell by about 200,000; employment in these industries increased by about 1.3 million. Surely the latter is an important piece of information on the source of the 4.1 million new jobs in 1977, but monthly seasonally adjusted figures of this sort are not presented in the BLS tables.

The second function served by such data would be to throw light on the differences between the two surveys. For example, the payroll survey reported an increase of about one million jobs in the finance and service industries during 1977 (December to December). Hence about 300,000, or half of the difference between the gains reported by the household and payroll surveys unaccounted for in Table 7−4 (cf. lines 3 and 4), can be attributed to this one industry sector. Much of the remainder can be attributed to wholesale and retail trade, where the household survey showed a gain of about 800,000, and the payroll survey, 600,000. It is probably significant that the differences are concentrated in these industries, because they are the industries in which it has always been difficult to locate, for purposes of the payroll survey, new and small employers. When there is a large increase in the number of retail and service establishments, the payroll survey may not pick them up immediately. When the figures are revised on the basis of additional information, the discrepancy may be reduced. In the meantime it is useful to know how consistent or inconsistent the two surveys are in what they report about industry employment, and this requires publication of the household survey figures.[8]

Employee Hours

The household survey provides the most comprehensive data available on the employment of the nation's work force. It also provides the most comprehensive data on the number of hours they work. Indeed, it is the only survey that purports to cover the number of hours actually worked, as distinct from the number of hours paid for—an important distinction in measuring productivity. Furthermore, the data on hours resolve, at least in principle, one of the chief differences between the household survey and the establishment survey—namely, the difference due to multiple job holding. If employed persons responding to the household survey report all the hours that they work at all jobs they hold, the aggregate hours reported should theoretically equal the aggregate hours reported on payrolls, where multiple job holders and the hours they work are counted on each payroll on which they appear.

Although the BLS publishes monthly figures on average hours worked per week from the household survey, the figures are not seasonally adjusted, nor are they combined with the employment figures to produce a series on aggregate hours worked. This is unfortunate. Such a series would represent the most comprehensive estimate of the amount of labor time utilized in the American economy. It would take account of the fact that a growing number of persons are employed part time—some of their own volition, some because full-time jobs are not available. The most comprehensive regularly reported figure of this sort is the aggregate hours of nonfarm wage and salary workers, an estimate developed largely from the establishment survey and used in the BLS estimates of productivity and labor cost.

To illustrate, in November 1977 this figure was 158 billion hours, seasonally adjusted at annual rate. It represents hours of work paid for, does not include the self-employed or unpaid family workers, and of course excludes agricultural workers. In comparison, the aggregate number of hours actually worked by all civilian workers, based upon the household survey, was 177 billion in November 1977, at annual rate but not seasonally adjusted. Seasonal adjustment would no doubt raise the November figure somewhat, but even so it is 12 percent higher than the 158 billion hours reported for nonfarm wage and salary workers. Furthermore, if those counted as employed but not actually working (some of whom are paid and some not) are credited with the same average workweek as those who were at work, the 177 billion figure becomes 184 billion hours (at annual rate), which is 16 percent above the 158 billion hours reported for nonfarm wage and salary workers, which also includes time paid for

but not worked. Since only a portion of these differences can be accounted for in the published data (e.g., the part attributable to agricultural workers), it would be desirable for the BLS to publish regularly a reconciliation table in terms of aggregate hours similar to the one for number employed that was recommended in the preceding section.

The principal objective, however, should be to report the comprehensive aggregate hours worked information from the household survey and to give the results prominent attention in press releases and analytical articles. Not only do they represent the most comprehensive measure of labor input, but the trend that they show may differ appreciably from that shown by the establishment data. For example, in November 1977 the aggregate hours worked by all civilian workers was 4.1 percent above the year ago figure, and the hours worked by nonfarm workers, also from the household survey, showed an identical rate of increase. But the establishment survey estimate for nonfarm wage and salary workers was up by only 3.4 percent over the year. The deficiency may lie in the discrepancies noted earlier, but it is not negligible and should not be obscured by failure to publish the requisite numbers.

The availability of the comprehensive aggregate hours series from the household survey would make it possible to compute an improved measure of labor utilization.[9] One of the limitations of the ratio of the number of persons employed to the total population of working age is that it does not take account of the fact that an increasing number of those employed work only part time. Each part timer is counted the same as a full timer, and those who work overtime or at more than one job are also counted only once. Vacation periods have been getting longer, and more holidays are observed. The aggregate hours worked figure makes allowance for all these variations. It could therefore be expressed in terms of the number of full-time equivalent persons employed. If the full-time workweek is assumed to be 37.5 hours, the November 1977 number of full-time equivalent persons employed would be 177 billion hours divided by 37.5 times 52, or 90.8 million persons. This compares with the 92.5 million persons actually employed. Relative to the working age population, the full-time equivalent employment ratio is 57 percent for November 1977, slightly smaller than the 58 percent based on the actual number of persons employed. Since the average number of hours worked per person employed has been declining for many years, for the reasons mentioned above, the trend in the full-time equivalent ratio will not be as steep as the trend in the ratio based upon the actual number of persons employed.[10]

Job Vacancies

It has long been held that one of the aims of economic policy is to see to it that everyone who wishes to work has an opportunity to obtain a job. Indeed, this objective is explicitly stated in the Humphrey-Hawkins Full Employment Act, in which the Congress "establishes as a national goal the fulfillment of the right of all Americans able, willing, and seeking to work to full opportunities for useful paid employment at fair rates of compensation" (§102). In order to meet such a goal, to determine whether or not it is being met, and to evaluate the policies and programs adopted to meet it, it is surely necessary to have comprehensive information on the job opportunities that exist—where they are, what skills are required, whether the positions are full time or part time, how long they have been available, and what compensation is offered. There is not much point in having a goal if you cannot tell where the goal posts are. In short, a job vacancy survey is needed.

The Bureau of Labor Statistics developed such a survey in 1965–1966 and began publishing the results of it in 1970. It was discontinued as of December 1973. At that time it was still in a developmental stage, partly because of inadequate funding. National coverage was restricted to manufacturing industries; data for all nonfarm industries were published for only a few cities. Nevertheless, the survey did yield illuminating information bearing upon the number, location, industry, and duration of job openings.[11]

For example, during the course of the one business cycle covered by the data, the number of vacancies in manufacturing declined from a high of 280,000 in April 1969 to a low of 80,000 in March 1971 and then rose to a high of 200,000 in October 1973. Employment in manufacturing moved in the same direction, from 20.2 million to 18.5 million to 20.2 million on the same dates. Unemployment among persons whose last job was with a manufacturing concern rose from 680,000 to 1,420,000 and then fell to 840,000. Thus, at the bottom of the recession job opportunities with manufacturing companies were negligible relative to the number of unemployed. Even at the 1969 peak there were more than two persons seeking work for every unfilled job opening, and at the 1973 peak the ratio was more than four to one. Nevertheless, it is clear that a considerable number of job opportunities did exist at the peak dates, suggesting that a part of the problem, even in good times, is matching people with jobs. The extent of the need for special efforts of this sort and the direction they should take—whether toward better information, greater mobility, more training, and so on—can be quantified only by accurate and comprehensive statistics on job vacancies.

Regularly published sources of statistical information on job vacancies are almost nonexistent. An exception is the index of help-wanted advertising compiled by The Conference Board from newspapers in fifty-one cities. A national index is compiled as well as an index for each city (based upon a single paper in each city). The city indexes give a vivid picture of where the growth in jobs has taken place and where it has not (Figure 7-2). In February 1978, for example, the index for New York City was 52 and for Dallas, 227, both in terms of 1967 = 100. That is, in New York the volume of ads was about half what it was ten years before and in Dallas more than double. The difference surely seems related to the fact that the unemployment rate in New York in the spring of 1978 was around twice as high as the rate in Dallas. There is less occasion for employers to advertise in New York, since employment has been declining, and there are many job seekers around. The opposite is true in Dallas. Unfortunately, perhaps, Dallas newspapers are rarely read in New York.

Although the value of the help-wanted advertising indexes is limited because the geographic breakdown is the only one available (no information is gathered on the types of jobs, etc.), it would be desirable to exploit them further. There is considerable geographic mobility in the labor force, especially among younger persons, and yet most people have very little knowledge about job markets outside of their local area. What cities have shown the biggest increases in help-wanted ads during the past year? The past ten years? Knowledge that the volume of ads in Dallas in February 1978 was 55 percent larger than a year ago and more than double that of ten years ago might induce some unemployed persons to look into the possibilities there. Information of this sort, widely publicized in areas of considerable unemployment, could help to draw people to where the jobs are and away from where they are not. One special advantage of this type of information is that everyone knows what help-wanted ads are—they have a concrete, visual significance that a statistic like the unemployment rate does not. Nearly a third of the job seekers in the country during 1977—that is, nearly two million persons—used help-wanted ads as a means of finding work. Figure 7-2 illustrates one way of presenting this information without anything as complicated as an index number.

Despite the limited coverage of the job market provided by help-wanted ads, their general validity as an indicator of where the jobs are is supported by other information, such as the BLS reports on hiring rates in manufacturing. Between February 1977 and February 1978 the four cities with the largest increase in help wanted ads as
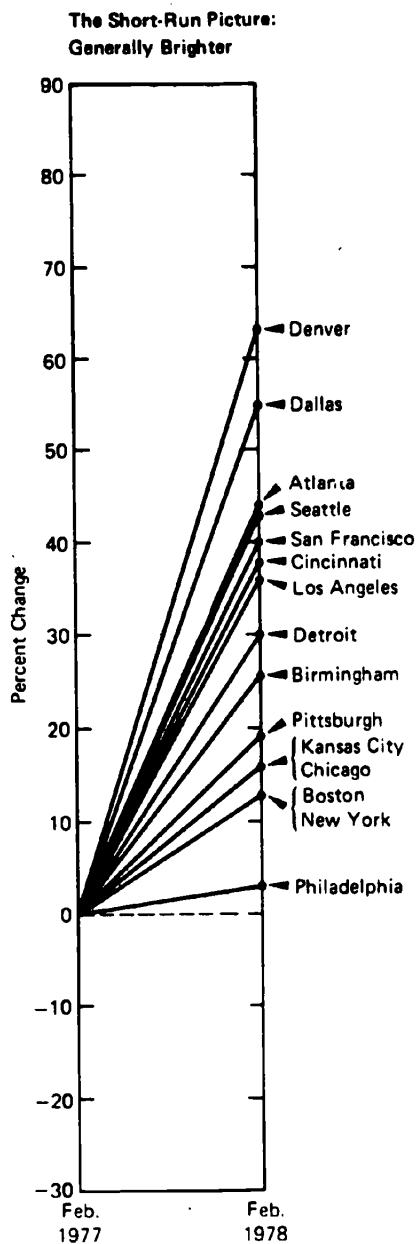
Figure 7−2.   Where the Jobs Are: Growth in Help-wanted Ads in Fifteen Cities.

**The Long-Run Picture: Rapid Growth in Some Cities,
Stability or Decline in Others**
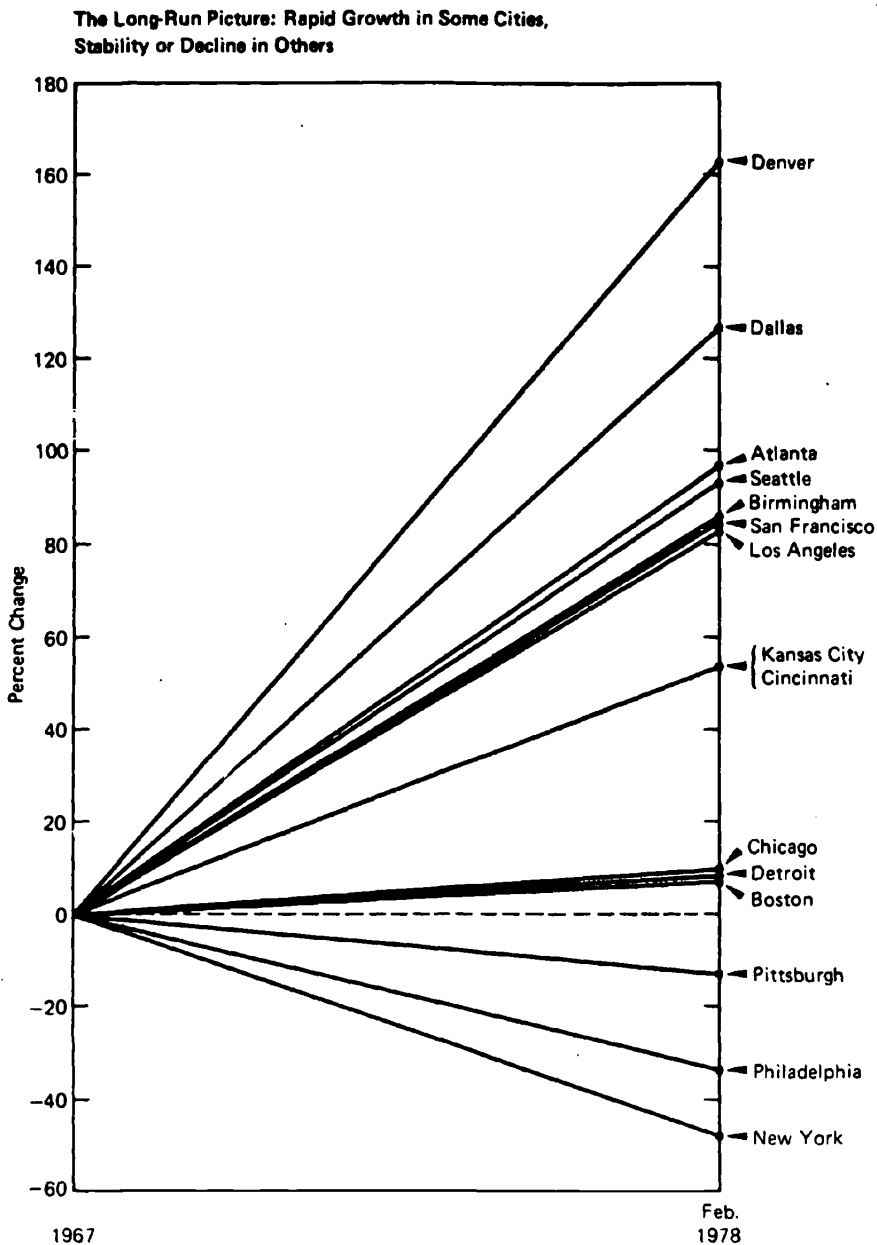
Source: *The Conference Board Statistical Bulletin*, April 1978.

Figure 7-2. continued

The Short-Run Picture:
Generally Brighter

shown in Figure 7–2—Denver, Dallas, Atlanta, and Seattle—were also the cities with the largest increase in new hires per hundred employees.[12] In short, these incomplete or indirect sources of information on employment demand are supportive and useful and could be exploited more than they now are to improve the functioning of the job market. Because of its relatively low cost, it would be worthwhile to consider extending the help-wanted advertising survey to more cities and securing more information on the types of jobs offered. In this manner it would help fill the gap pending the implementation of a comprehensive monthly or quarterly survey of job vacancies that the country needs as part of its employment information system.

State and Local Employment

As noted in the preceding section, the variations across the nation in the demand for labor are enormous. Long-run growth trends are vigorous in some localities, sluggish in others. By 1970, for example, the three Pacific Coast states had 25 percent more people than they had in 1960. The three Middle Atlantic states had gained 9 percent. Two and a half million persons migrated to the Pacific Coast states during this period, while net migration to the Middle Atlantic states was 60,000. Partly because growth trends are different, but also for other reasons, recessions do not hit all parts of the country in the same way. During the 1974–1975 recession, the Middle Atlantic states lost about half a million jobs; in the Pacific Coast states the net loss was only 15,000.

Variations of this magnitude have great significance for the behavior of labor markets, the interpretation of current developments, and the policies that may be appropriate to deal with them. In consequence, the statistical system that yields information on state and local area employment and unemployment must be adequate to meet the demands placed upon it.

Something in this direction can be accomplished by enlargement of the household survey sample to provide better coverage of smaller areas. This is expensive, however, and in order to keep the cost burden down, it would be desirable to exploit less expensive alternatives. One of them is to make fuller use of the employment data collected in the establishment (or payroll) survey. This survey covers approximately 160,000 establishments each month, reporting on about 35,000,000 employees, or about 40 percent of the total number of nonfarm employees in the country. Because of its vast coverage (for example, the household survey covers directly only 54,000 households, less than 0.1 percent of the total number of households), the establishment survey provides much geographic detail. Estimates

of employment, hours, and earnings are made monthly for all states and many cities and towns.

One specific use of these data, which has not to my knowledge been explored before, is to use the employment and hours estimates for a given locality to compute the number of full-time equivalent employees in the area and then to take this as a ratio to the area's population of working age. The change in this ratio during a recession might be expected to give a fairly accurate measure of the severity of the impact of the recession on that area, especially when compared with similar changes during previous recessions. This ratio has some of the merits of the employment-population ratio described in the first section of this chapter and perhaps some additional advantages as well. The definition of who is employed is based on a payroll report by an employer, and since the number of hours worked (actually, the number paid for) is also reported, an adjustment is automatically made for part-time workers and for those with more than one job, as well as for those working overtime. Conversion of total reported man hours to full-time equivalent workers is, of course, an arbitrary step, and the level of the resulting estimate will depend on the number of hours assumed to represent full-time work. But as long as this number is kept constant, the change over time in the resulting estimates will not be affected.

Hence the numerator of the proposed ratio—number of full-time equivalent employees—has the conceptual advantage of representing actual working time paid for by employers and the statistical advantage of a large sample base. As for the denominator—the population aged sixteen and over—there may be problems in providing a population estimate for local areas monthly or quarterly, but they are no different from the problems in providing a population base for a household survey, and such estimates present fewer conceptual difficulties than estimates of the labor force. Problems having to do with the place of residence of employees reported in the establishment survey would also have to be dealt with.

I have not explored this suggestion in detail, but Figure 7—3 compares the national figures for the proposed full-time nonfarm employee ratio with those for the total civilian employment-population ratio and the unemployment rate. It is evident that the long-run trends of the three series are rather different but that the cyclical movements, for the most part, are quite similar. Table 7—5 compares the changes in the three series during business cycle recessions. All three yield approximately the same picture of the relative severity of the six recessions and indeed are very highly correlated with one another.[13] If the full-time equivalent employee ratio is used to esti-

Figure 7–3. Two Employment-Population Ratios and the Unemployment Rate.
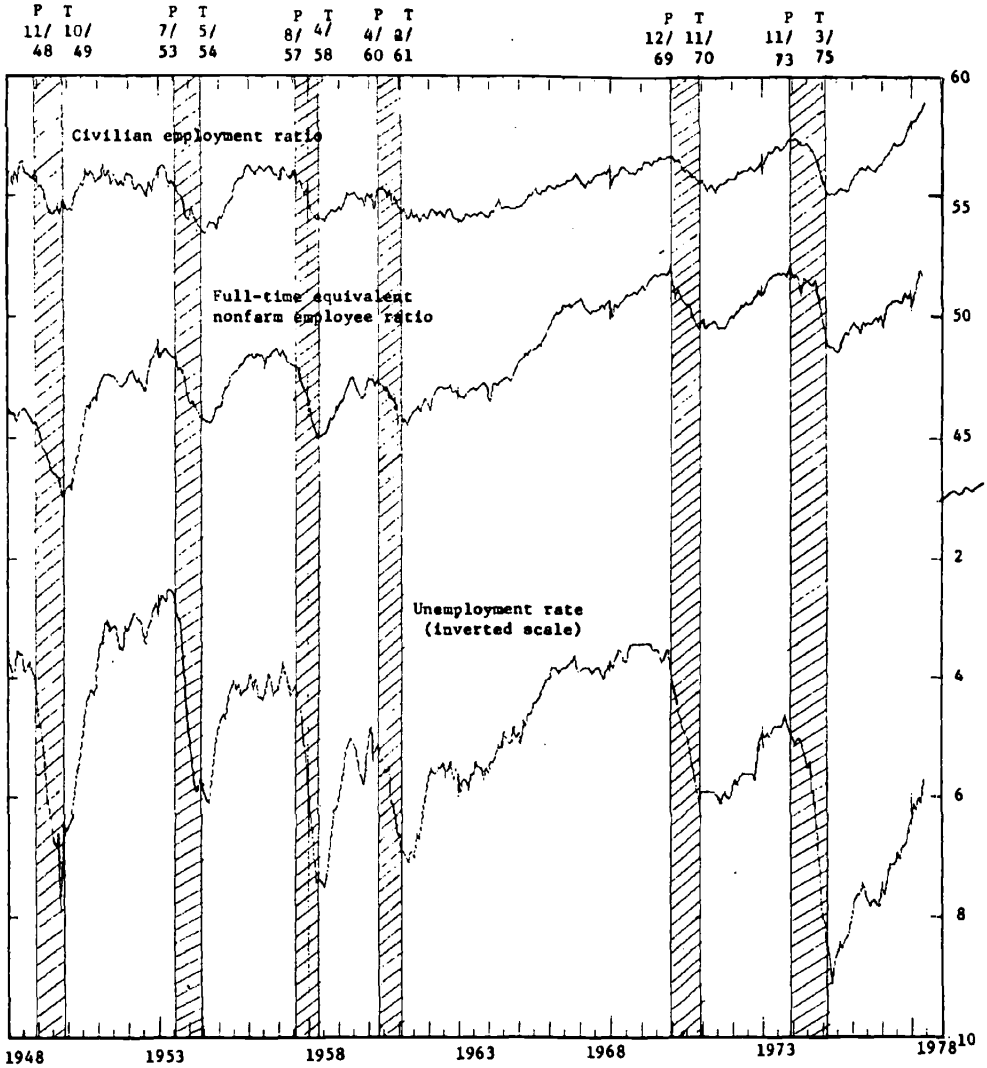
Note: Shaded areas represent business cycle contractions from peak (P) to trough (T).
Source: Compiled from data published by the U.S. Bureau of Labor Statistics.

Table 7-5. Three Measures of the Impact of Recessions upon Employment.

Business Cycle Recession		Change in Percentage Points from Business Cycle Peak to Trough			
		Full-time Equivalent Nonfarm Employee Ratio	*Civilian Employment Ratio*	*Unemployment Rate*	
Peak	*Trough*			*Actual*	*Estimated*
(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
November 1948	October 1949	-2.7	-1.3	+3.1	+3.1
July 1953	May 1954	-2.3	-1.7	+3.2	+2.6
August 1957	April 1958	-2.7	-1.6	+2.9	+3.1
April 1960	February 1961	-1.5	-0.5	+1.6	+1.7
December 1969	November 1970	-2.1	-1.0	+2.2	+2.4
November 1973	March 1975	-3.0	-2.1	+3.5	+3.5

Note: Entries in columns 3, 4, and 5 represent the difference between a three month average centered on the business cycle peak month (column 1) and a three month average centered on the business cycle trough month (column 2). Column 6 is calculated from a regression fitted to the entries in columns 3 and 5, namely:

Change in unemployment rate = $-0.1 - 1.2$ times change in full-time equivalent employee ratio.

Source: Derived from Bureau of Labor Statistics data, seasonally adjusted.

mate the change in the unemployment rate, as shown in the last column of the table, the errors in the estimates average only two-tenths of a percentage point, and the largest error, in 1953−1954, is six-tenths of a percentage point. At the national level, therefore, the ratio serves as an excellent proxy for estimating the change in unemployment during recessions. Unlike the unemployment rate, however, it focuses squarely upon the loss of work that recession brings. A careful examination of its value and limitations as an instrument for gauging the impact of recession upon state and local area employment is recommended. Such a study is eminently feasible because of the availability for a long historical period—covering several recessions—of the extensive collection of employment and hours data for states and metropolitan areas.

A CONTINUING AUDIT OF EMPLOYMENT STATISTICS

Thoroughgoing reviews of employment statistics by such bodies as the Levitan commission and the previous Gordon Committee are highly desirable, but are bound to be infrequent. As a result, problems with the data accumulate, sometimes for years, when many of them could have been resolved much more quickly. The impetus provided by an authoritative monitoring or auditing agency, outside the statistical agencies themselves and responsive to problems seen by users of the data and those who supply the information, needs to be harnessed on a continuing basis. In particular, such an agency should be charged with seeing whether the recommendations that are made are being carried out.

The perception of this need is no criticism of the statistical agencies or of the functioning of the Office of Statistical Policy, now located in the Department of Commerce. Many improvements in the statistics originate in the agencies themselves, and the professional statisticians in charge of the work are usually fully aware of deficiencies that should be overcome or of new needs that have arisen. Nevertheless, they may not have the resources or the "clout" to do what should be done, especially when it involves the discontinuance of some types of data and the starting up of others or the changing of a definition or a concept. An outside group, available for consultation and support on such matters, can take an independent look from a broad point of view and can develop recommendations that will carry weight because of the process by which they were formulated and the auspices under which that process was conducted.

Continuity in such an auditing process is needed to insure timeliness and to secure attention to the little problems or new ideas that can be quickly taken care of as well as to the bigger ones that take longer. The work should be conducted with adequate safeguards to assure objectivity and professional competence. An agency such as the National Research Council would be an appropriate sponsor, operating on a committee level with a small permanent staff of experts, some of whom might be engaged on a part-time or consulting basis. A larger advisory group of data users from business, labor, government, and universities should be consulted regularly with regard to priorities, new areas for study, and review of preliminary results. It would be desirable for the auditing committee to issue an annual report to keep the Congress, the executive branch, and the public informed about its work. Reports on particular subjects should be published in professional journals or other suitable media.

A continuing audit of employment statistics organized along these lines would strengthen confidence in the employment and unemployment statistics, since there would always be an authoritative body to which questions about the data could be put. During 1978, for example, questions were raised about the validity of the seasonal adjustment of the employment and unemployment data. Some charges surfaced in the press suggesting that the figures were being manipulated. A watchdog group could investigate such charges promptly and issue an appropriate response. Sometimes it might anticipate the problems of credibility that can arise from a change in methodology or procedure. As it gained recognition, the auditing committee would be consulted directly by the press or others who had questions to raise.

An important matter that needs periodic investigation is to what extent data are being used. The auditing committee should conduct surveys of statistics users and evaluate the results, disclosing what types of data are little used and might be discarded as well as types that are needed. Regular consideration of this question would be helpful in the budgetary process and in assuring that the statistical dollar is being well spent.

The President's Commission on Federal Statistics, which reported in 1971, recommended that frequent "statistical audits" be organized covering a wide range of subjects and specialties. It also recommended that there be a "continuous review of federal statistical activities, on a selective basis, by a group of broadly representative professionals without direct relationships with the federal government."[14] The proposal just outlined combines both of these ideas—

a statistical audit and a continuing outside review—focusing on employment statistics.

NOTES TO CHAPTER 7

1. Congressional Record (Washington, D.C.: January 20, 1978) p. S 115.

2. The four-to-one ratio persisted during the first half of 1978. Between December 1977 and June 1978 the number employed increased 2.2 million while the number unemployed dropped by 0.5 million. The percentage of the population with jobs reached a record high in June 1978 of 58.9 percent, while unemployment still remained in the range experienced during the 1974 recession.

3. For further analysis evaluating the employment ratio as a factor in inflation in both Canada and the United States see Chapter 13, and Christopher Green, "The Employment Ratio as an Indicator of Aggregate Demand Pressure," *Monthly Labor Review*, April 1977, pp. 25–32.

4. Julius Shiskin, in "Measuring Current Economic Fluctuations," *Annals of Economic and Social Measurement* (NBER) 2, no. 1 (January 1973): 1–15, constructed measures of the revisions in eighteen economic indicators due to revision of seasonal factors, 1965–1969, including employment and unemployment. The average revisions in the monthly percentage changes of the seasonally adjusted data arising from revisions of seasonal factors, without regard to sign, was 0.12 percent for employment and 1.55 percent for unemployment. The average monthly change in the cyclical component (a smooth flexible moving average of the seasonally adjusted data) of the two series is 0.20 for employment and 1.13 for unemployment. Hence the "noise" due to seasonal revisions is only 60 percent as large as the "signal" in the case of employment, but 37 percent larger than the signal in the case of unemployment. Shiskin notes that the irregular component of the series, quite apart from revisions, also is smaller relative to the cyclical component for employment than for unemployment. The average month-to-month change in the irregular component is 0.22 for employment and 2.75 for unemployment. Finally, in a measure that combines both sources of noise (revisions and irregular movements), Shiskin computes a noise-to-signal ratio, which is 1.70 for employment, 3.81 for unemployment. Changes taken over longer spans than a month reduce the noise-to-signal ratio, but of course delay recognition of the signal. For employment the delay required for the signal to exceed the noise, on the average, is two months; for unemployment, four months. Presumably the same relationships hold for the employment and unemployment percentages, since the denominator (working age population) is the same for both.

5. See, for example, Robert W. Bednarzik, "Involuntary Part-time Work: A Cyclical Analysis," *Monthly Labor Review*, September 1975, pp. 12–18; and Bureau of Labor Statistics, *Employment in Perspective: A Cyclical Analysis of Gross Flows in the Labor Force*, Report 508 (Washington, D.C.: Bureau of Labor Statistics, 1977).

6. Gloria P. Green, "Comparing Employment Estimates from Household and Payroll Surveys," *Monthly Labor Review*, December 1969, pp. 9–20; Gloria P. Green, "Nonagricultural Employment as Measured by Two Series," *Employment and Earnings*, March 1978; Christopher G. Gellner, "A 25-Year Look at Employment as Measured by Two Series," *Monthly Labor Review*, July 1973, pp. 14–23; Joseph Antos and others, *Why Employment Estimates Differ*, Working Paper 65 (Washington, D.C.: Bureau of Labor Statistics, October 1976); Alexander Korns, "Coverage Issues Raised by Comparisons between CPS and Establishment Employment," *1977 Proceedings of the Social Statistics* Section (Washington, D.C.: American Statistical Association, 1978).

7. A detailed table was presented by the Commissioner of Labor Statistics, Julius Shiskin, in his December 2, 1977, statement before the Joint Economic Committee (Washington, D.C.: Bureau of Labor Statistics, mimeo).

8. See Gellner, "A 25-Year Look at Employment."

9. For further analysis of the household survey data on aggregate hours see Richard Ruggles, "Employment and Unemployment Statistics as Indexes of Economic Activity and Capacity Utilization," Background Paper No. 28 (Washington, D.C.: National Commission on Employment and Unemployment Statistics, April 1979).

10. For another full-time equivalent employment ratio, based on the establishment and survey figures for nonfarm workers, see the section below on state and local employment.

11. See Paul A. Armknecht, Jr., "Job Vacancies in Manufacturing," *Monthly Labor Review*, September 1975, pp. 12–18.

12. For further analysis of the validity of the series, consult Charlotte Boschan, "Job Openings and Help Wanted Advertising as Measures of Cyclical Fluctuations in Unfilled Demand for Labor," in *The Measurement and Interpretation of Job Vacancies* (New York: NBER, 1966).

13. The correlation (r) between the changes during the six recessions are:

Full-time equivalent employee ratio and unemployment rate: -0.92;
Civilian employment ratio and unemployment rate: -0.95; and
Full-time equivalent employee ratio and civilian employment ratio: +0.89.

14. Federal Statistics: A Report of the President's Commission, Vol. 1 (Washington, D.C.: 1971), pp. 171–175.