LABOR MARKET DATA

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This article is part of a series that will be published by this Bank under the title Macroeconomic Data: A User's Guide. *The book will contain introductions to important series of macroeconomic data, including prices, employment, production, and money. The articles in the book are designed to help the reader accurately interpret economic data and thereby allow the numbers to be useful analytical tools.*

Aggregate data on jobs, unemployment and earnings are closely watched by millions of Americans. The unemployment rate is probably the single most widely followed economic indicator. Among financial market participants, the number of people employed is perhaps the most closely followed macroeconomic statistic that appears monthly. These and other selected labor market indicators are described in this article.

HISTORICAL DEVELOPMENT

Statistics describing the labor market were estimated as early as 1820, based on questions from the decennial Population Census. In the last decade of the nineteenth century, the newly formed Bureau of Labor—the predecessor of the Bureau of Labor Statistics (BLS)—began to collect detailed data on wages and earnings. In 1915, the Bureau began a monthly survey of employers to collect wage and employment data. This survey is still conducted, and data from it are reported on a monthly basis; it is often referred to as the *establishment survey*, or also as the *payroll survey*.

After a century of collecting data on labor markets, there was surprisingly little systematic information on the extent of unemployment. When national attention focused on unemployment during the Great Depression, it was not immediately obvious how to define or to gather relevant information. In 1940 a monthly survey was designed, which is now known as the *Current Population Survey*. Information from the survey allowed an unemployment rate to be calculated. By 1945 the questions were developed which form the basis of the Survey used today, which is usually referred to as the *household survey*.

MAJOR DATA SERIES

Data From the Household Survey

Each month over fifty thousand households are interviewed by the Census Bureau for the BLS as part of the household survey. The BLS then analyzes the survey results and reports its findings near the beginning of the next month, usually on the first Friday. Many statistics from this survey could be discussed; the key concepts in this section are the unemployment rate, the number of people employed, and the labor force participation rate.

Unemployment rates are calculated for the entire nation and also for more narrowly defined demographic groups and geographic areas.[1] An unemployment rate is defined as the number of people unemployed as a percentage of the *labor force*. The size of the labor force, in turn, is defined as the number of people *employed* plus those *unemployed*, that is, people without jobs who are willing and able to work.

All three terms, employed, unemployed, and labor force, have very specific definitions. A person is counted as unemployed if he or she did not work during the survey week and:

(a) made a specific effort (which can be anything from talking to friends to interviewing for a specific opening) to find a job within the previous four weeks, and was available for work during the survey week; or

(b) was waiting to be called back to a job after being laid off; or

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[1] Press reports often mention two unemployment rates. One is calculated by removing military personnel from the calculations and is slightly smaller than the overall rate.

(c) was waiting to report to a new job within 30 days of the survey.

A person is defined to have been employed if he or she:

(a) did any work at all as a paid employee, as a proprietor or farmer, or worked 15 hours or more as an unpaid worker in an enterprise operated by a member of the family; or

(b) had a job but was not working during the survey week due to a temporary absence resulting from illness, bad weather, vacation, labor-management disputes, or personal reasons. Employment status is not affected by whether or not pay is received during the absence, nor by whether or not another job is being sought.

Finally, the labor force is simply the sum of persons who are employed plus those who are unemployed. The overall *participation rate* is defined as the labor force as a percentage of the population at least sixteen years of age. Participation rates are also calculated for smaller segments of the population, again defined as the labor force as a percentage of the relevant population segment.

There are many reasons why a person may not be in the labor force, such as age, health, home responsibilities, being in school, not wanting to be employed, or not believing that job search would be fruitful. The latter category is referred to as *discouraged workers*; they are counted as those who would like a job but are not looking for work for one of the following reasons listed in the household survey:

"thought no jobs were available in their line of work or area."

"previously tried unsuccessfully to find work."

"lacked the necessary schooling, training, experience, or skills."

"felt employers considered the person too young or too old."

"had some other personal handicap in finding work."

One's intuitive definitions of employment or unemployment may be somewhat different from the specific definitions given above. In particular, people who are not working vary tremendously in the amount of thought and effort spent on finding work; it is inherently arbitrary to divide people without jobs into only two categories, unemployed or not in the labor force. Some analysts would add discouraged workers to the unemployed, thereby boosting the reported unemployment rate. Others would lower the unemployment rate by defining those who did not actually contact potential employers as being out of the labor force.

Behavior Over Time Chart 1 shows the unemployment rate over the post-World War II period. One notable feature is that sharp swings are associated with the business cycle, the alternating periods of expansion and recession in the whole economy. Another feature is the general upward drift for much of the chart after abstracting from business cycles.

Chart 2 shows the participation rate. Especially notable is the substantial increase over the past 25 years. The major factor behind that increase can be seen in the table, which contains the current demographic composition of the labor force and contrasts it with the labor force in 1948 and 1969. The rapidly growing fraction of adult women in the labor force more than counteracts a decline in the fraction of men in the labor force, resulting in a growing participation rate for the whole population. The table also reveals relatively high unemployment rates for blacks and teenagers.

DATA FROM THE ESTABLISHMENT SURVEY

The establishment survey covers the industry, hours, and earnings of most employed members of the labor force. State agencies send survey forms to over 300,000 establishments, who then record the requested information and return the forms to the state agencies for processing. These agencies then forward the tabulated information to the BLS in Washington, D.C. The information is sent back and forth between the collecting agencies and participating establishments for one year; a written record of the numbers can therefore be reviewed by both the providers and collector of the information.

Employment and earnings figures are classified by each worker's characteristics, such as sex, industry, and job category. A person is counted as *employed* if he or she is on the payroll of an establishment for the pay period which includes the 12th of the month.[2] This measurement excludes proprietors, unpaid volunteers, family workers, farmers and farm workers, and domestic household workers. Salaried officers of corporations, civilian government employees, and part-time workers are included, however.[3]

Industry *hours and earnings figures* also originate in the establishment survey. Figures are presented in

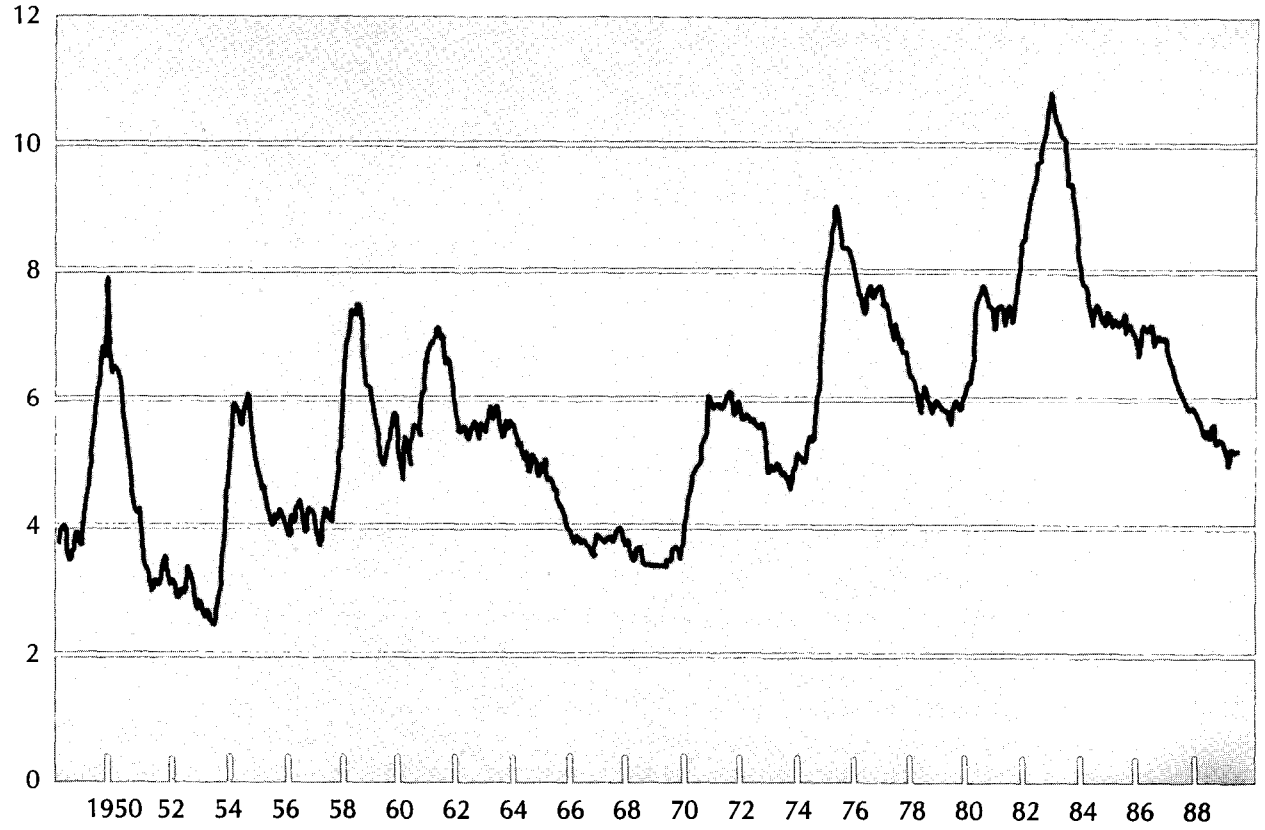
[2] Employees of the federal government are counted if they occupy a position as of the last day of the calendar month.

[3] Employees of the Central Intelligence Agency and the National Security Agency are explicitly excluded from the survey.

Chart 1

UNEMPLOYMENT RATE

January 1948 - September 1989



detail for Production and Related Workers in manufacturing and mining, Construction Workers, and Nonsupervisory Employees in service industries. The *hours* statistic reports the number of hours paid for by the employer in the current reporting period, not the number of hours actually worked. This figure therefore includes items like holidays, vacations, and sick leave. *Overtime hours* includes that time for which a premium is paid. Weekend and holiday hours are included separately only if overtime premiums are paid. Hours which have only incentive premiums attached, such as shift differential and hazard premiums, are excluded from the overtime hours measurement.

Average hourly and weekly earnings for nonsupervisory workers are estimated from data reported in the establishment survey. Three features have led some observers to question the relevance of that concept for studying certain problems. First, the data do not include fringe benefits, which play a major role in the compensation of most workers. Second, the data do not cover executive, administrative, and managerial workers in private industry, nor do they cover state and local government workers. And finally, the data are affected by changes in the composition of employment.

To address those problems, the BLS also publishes a quarterly *employment cost index* (ECI),[4] which is based on a special survey of employers. It is designed to cover all workers in private industry plus state and local government. The ECI adds the cost of providing a wide range of fringe benefits to wage and salary payments; some of the most expensive benefits are social security and unemployment insurance taxes, paid vacation and sick leave, health and disability insurance, and retirement plans. The ECI is also based on a fixed industry and occupational structure. Shifts between industries or occupations do not directly affect the index.

[4] A more accurate title might be employee compensation index, however. Significant elements of labor cost that are not included are the costs of hiring, training, and strike activity.

Chart 2

PARTICIPATION RATE

January 1948 - September 1989

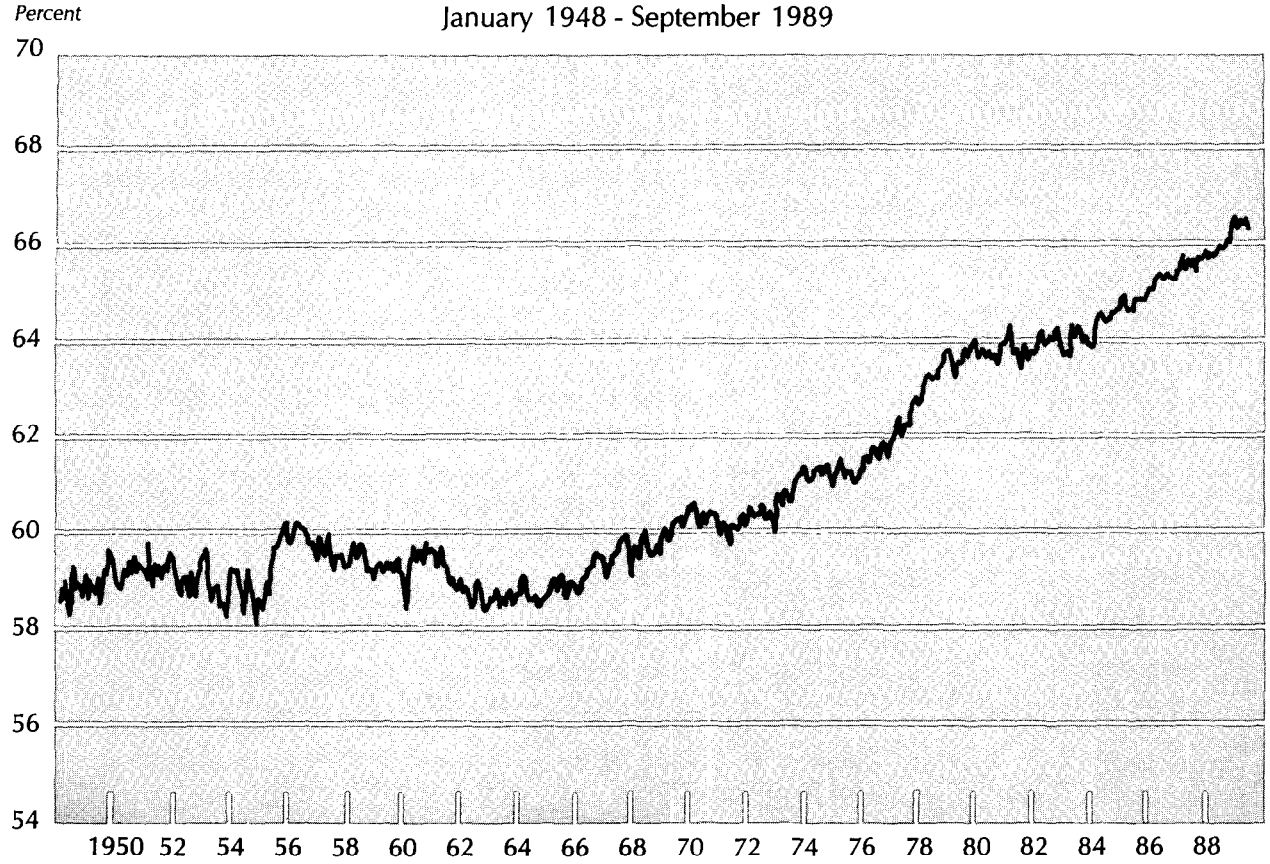


Chart 3 compares the ECI and average hourly earnings statistics. Both show a substantial decline in the growth rate of compensation since the early 1980s, as general price inflation also declined substantially. The ECI has grown faster than average hourly earnings for much of the period, however, reflecting the growing relative importance of fringe benefits.

CAUTIONS

The data series described above provide a wealth of timely, relevant information. The data can be misinterpreted, however. The following cautions are designed to help place data series in perspective. The first two concern the exact meaning of widely used terms.

Meaning of Terms

Unemployment Some observers tend to equate the level of unemployment with an unambiguous measure of economic hardship. The unemployment rate, however, is a much more complex statistic. It does not refer to an unchanging group totally composed of desperate individuals. It instead is a snapshot—a view at an instant of time—of people who are entering and leaving the labor force, and of those who are starting and ending particular jobs. Some unemployed persons find jobs quickly, others more slowly, and some people move directly from outside the labor force to employment. Some job changes are voluntary, others are involuntary.[5]

To help put unemployment rates in perspective, note that it is often not in the best interest of an unemployed person to take the first available job. It may take time to achieve a good match between a person's interests, skills, and abilities on the one hand, and a job's skill requirements, working conditions, and promotion possibilities on the other.

[5] In June 1989, for example, 42 percent of the unemployed had lost their last job, 15.5 percent had quit their last job, and 42.5 percent were new entrants or reentrants into the labor force. Half were unemployed less than six weeks, while 9.1 percent were unemployed more than a half year.

DEMOGRAPHIC COMPOSITION OF THE LABOR FORCE IN THE UNITED STATES

(Thousands of persons unless otherwise indicated)

Characteristic	1948	1969	1989
TOTAL			
Civilian Labor Force	60,621	80,733	123,291
Percent of total population	58.8	60.1	66.4
Employed	58,344	77,902	116,900
Unemployed	2,276	2,831	6,391
Unemployment rate	3.8	3.5	5.2
MEN, AGE 20 & OVER			
Civilian Labor Force	40,687	46,351	63,468
Percent of adult male population	86.6[a]	83.0	78.1
Employed	39,382	45,398	60,642
Unemployed	1,305	963	2,827
Unemployment rate	3.2	2.1	4.5
WOMEN, AGE 20 & OVER			
Civilian Labor Force	15,500	27,413	51,890
Percent of adult female population	31.3[a]	41.5	57.6
Employed	14,936	26,397	49,514
Unemployed	564	1,016	2,376
Unemployment rate	3.6	3.7	4.6
TEENAGERS (16-19)			
Civilian Labor Force	4,435	6,969	7,933
Percent of teenage population	52.5	49.4	55.2
Employed	4,026	6,117	6,745
Unemployed	409	852	1,188
Unemployment rate	9.2	12.2	15.0
WHITE			
Civilian Labor Force		71,778	105,964
Percent of white population	58.2[b]	59.9	66.7
Employed		69,518	101,338
Unemployed		2,260	4,626
Unemployment rate	3.5	3.1	4.5
BLACK[c]			
Civilian Labor Force		8,959	13,444
Percent of black population	64.0[b]	62.1	64.4
Employed		8,384	11,898
Unemployed		570	1,561
Unemployment rate	5.9	6.4	11.2

Note: Data represent the first quarter of 1989 and the full years of 1948 and 1969, and are taken from the *Monthly Labor Review* and the *Economic Report of the President*, various issues. Unless otherwise indicated, all population figures exclude military and institutionalized personnel, and young persons less than sixteen years old.

[a] Age 14 and over.

[b] Data are for 1954, not 1948.

[c] Nonwhite before 1972.

Recognizing the inevitability of such *search unemployment* implies a positive unemployment rate.

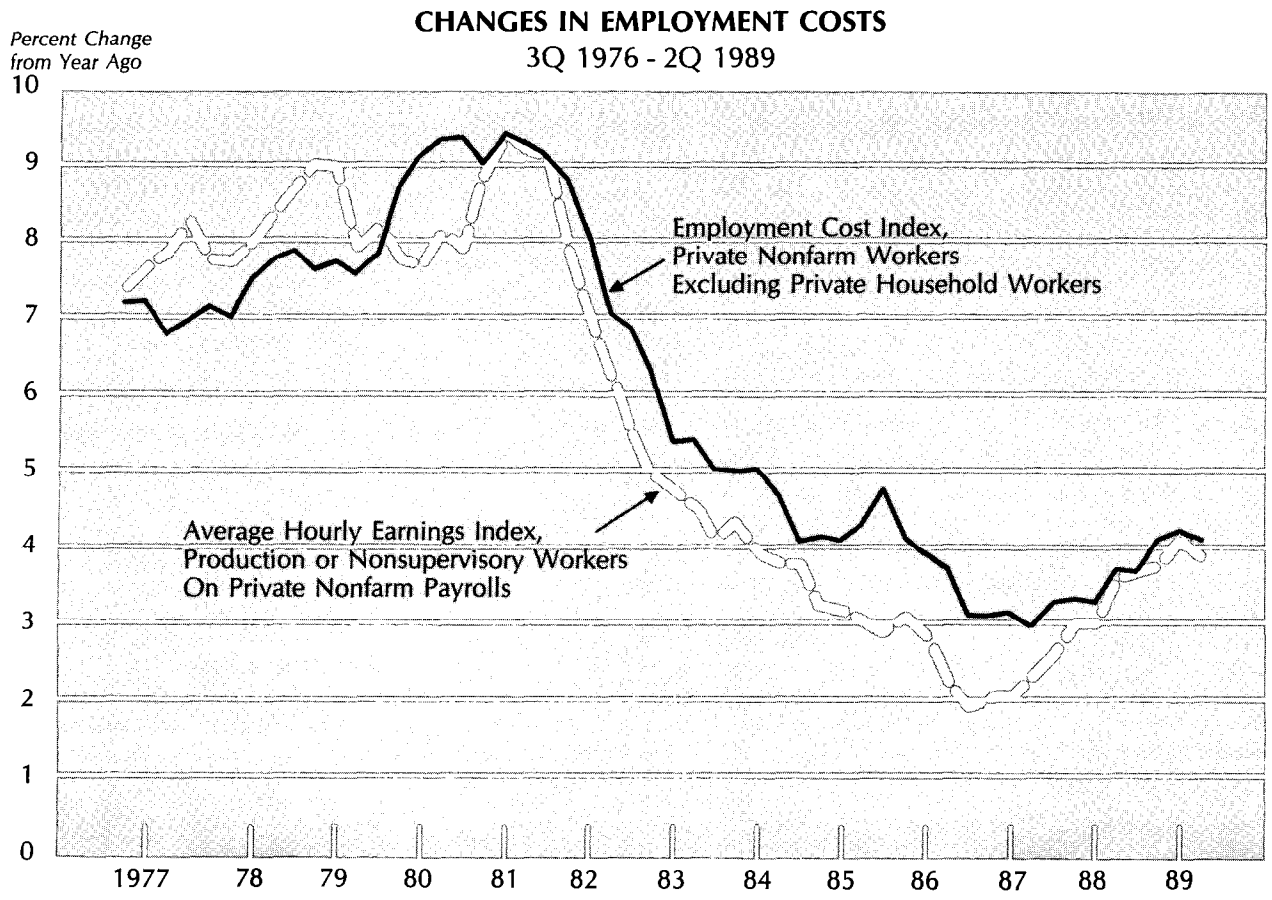
In short, a normally functioning economy will have some unemployment, and every unemployed person does not experience substantial hardship.[6] To provide a perspective for business cycle analysis, some economists refer to a *natural rate of unemployment*, defined in one textbook[7] as "that rate of unemployment at which flows in and out of unemployment just balance, and at which expectations of firms and workers as to the behavior of prices and wages are correct." The natural rate is neither constant nor precisely known; at the present time many economists believe that it is between five and six percent in the United States. If actual unemployment were much higher, that would be evidence of cyclical slack in the economy; and if the actual rate were much lower, that would signal an overheated economy.

The term "natural" is widely used but may be misleading, since there should be no presumption that the current natural rate is either optimal or immutable. The natural rate is affected by the incentives and constraints facing persons and firms; anything that affects the average frequency or duration of unemployment will also affect the natural rate. Some important factors affecting the natural rate

[6] An individual's hardship is also affected by household wealth and by whether transfer payments, such as severance pay or unemployment insurance, are received. In addition, some unemployed persons are on temporary layoff and will almost certainly be recalled; others may have accepted a job that begins in more than a month.

[7] Rudiger Dornbusch and Stanley Fischer, Macroeconomics, 3rd ed. (New York: McGraw-Hill) 1984, p. 466.

Chart 3



are the unemployment insurance system, household wealth, minimum wage legislation, the demographic composition of the labor force, the mobility of labor, and the dispersion of skill levels in the labor force.

Compensation of Employees Many forms of compensation are ignored in the wage figures reported each month, including some that are growing especially rapidly. Fringe benefits are excluded, as are contingent payments such as lump sum payments in lieu of wage increases, bonuses, profit-sharing payments, and stock options. In addition, some benefits are not even included in the ECI. For example, medical benefits for retirees have been promised by many employers with no provision having been made for funding those costly benefits. They are thus not included in the ECI.

Two Definitions of Employment

The next caution involves one concept, employment, that is estimated from both the household and establishment surveys. The two should move together closely in the long run; however, in any month they can diverge substantially.

To see why employment totals can differ, note the slightly different definitions of employment for each survey. The establishment survey counts jobs, not people; dual job holders are therefore double-counted. The household survey only covers the number of people employed, so that a person is never double-counted. The household survey also counts self-employed persons, agricultural workers, and household workers, all of whom are omitted from the establishment survey.

Many observers may prefer to ignore monthly changes and focus on the longer run; for them it probably does not matter which series they focus on. But those with a short-run perspective often have to choose one or the other when the two series give conflicting signals. Many choose the establishment series, since its growth is more closely correlated

with real GNP growth than is the other estimate.[8] Also, the number of firms surveyed is much larger than the number of households surveyed, which could in principle result in a more accurate estimate from the establishment survey. And finally, it is noted below that some analysts question the accuracy of survey responses from households.

Volatile Monthly Observations

Sampling Error A final set of cautions warns a user not to overemphasize a single month's data. A basic reason is sampling error—that is, statisticians are attempting to *estimate* a statistic for a large population from a relatively small survey. It is especially important as smaller segments of the labor force or smaller geographic areas are studied. As Geoffrey Moore put it:

> A rise, say, from 5.0 to 5.3 percent in the unemployment rate is statistically significant, whereas a rise from 9.7 to 10.4 percent in the unemployment rate for blacks is not. The reason is that the population of whites is about ten times that of blacks, so that the sample of whites is also about ten times as large. Coupled with the fact that the unemployment rate for blacks is about twice that for whites, this means that the sampling error of the unemployment rate for blacks is about four times as large as for whites.[9]

The key concept is that of *statistical significance*, that is, whether a result is likely to have resulted simply from chance; a statistically significant result is not likely to be due to sampling error. Moore uses a 0.2 percent change for the total unemployment rate, and a 0.8 percent change for the black unemployment rate, as thresholds for statistical significance.

One should therefore be cautious in attaching much importance to a single month's changes without having some idea of how large a change must be to be statistically significant. This caution applies more forcefully as the size of the relevant population becomes smaller. On the other hand, consistent movements for several months considerably reduce the likelihood of the fluctuations being due to chance. Also, one's confidence in a single month's change can be bolstered or reduced by movements in related statistics. For example, suppose that employment growth is reported to have been relatively strong but also that average weekly hours were relatively soft. In that case one could reasonably question the economic importance of the employment figure.

Responses to Survey Data Individuals responding to the household survey may respond for themselves and any other adults in the household without checking written records. Some observers have questioned the reliability of that information. It is, of course, difficult to know the exact relevance of answers to questions from any survey. One piece of evidence is a test in 1977 that compared individual responses with employer records.[10] Relative to employers' records, household respondents overstated the number of hours worked and understated both average hourly and weekly earnings.

Irregular Events All the monthly data series described in this article are adjusted to remove predictable seasonal fluctuations such as the swell in Christmas employment, or the effects of summer vacations for students. Events that occur on an irregular basis can be more difficult to take into account. Strikes, for example, lower employment estimates from the establishment survey but do not directly lower employment (or raise unemployment) estimates from the household survey. And while the BLS may note an estimate for the direct effect of a strike, the indirect effects may be substantial but not estimated; an example of an indirect effect would be layoffs of railway and port workers after a coal strike reduced coal shipments. Extreme weather conditions can also affect the data, even after routine seasonal adjustment.

SUGGESTIONS FOR FURTHER READING

Many books, professional journals and government reports have been written about labor market data. For an overview of labor markets and how they fit into the larger economy, readers may wish to look at a macroeconomics textbook such as Robert Barro, *Macroeconomics*, John Wiley and Sons; or Dornbusch

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[8] To check the validity of that common assertion, we regressed real GNP growth on four own lags plus four lags of quarterly employment growth, from 1948 to 1989. For the household series, the $\bar{R}^2$ statistic was 0.36; for the payroll series it was 0.56. Since both employment statistics are subject to sampling error, it is possible that the average of the two might be better than either one individually. We therefore substituted the average of the two for the employment variable in the regression equation; the $\bar{R}^2$ statistic was 0.51. For monitoring the overall economy, it therefore looks like the payroll series is the better choice, and that averaging the two does not improve matters.

[9] Geoffery H. Moore, Business Cycles, Inflation, and Forecasting (Cambridge: Ballinger Publishing Co. for the National Bureau of Economic Research, 1980) p. 111.

[10] Accounts of this test are taken from Joseph R. Antos, "Analysis of Labor Cost," in Jack E. Triplett ed., *The Measurement of Labor Cost*, (University of Chicago Press for the National Bureau of Economic Research, 1983) p. 162.

and Fisher, op cit. For a more detailed analysis of labor supply and demand and market institutions, see a text on labor economics, such as Ronald G. Ehrenberg and Robert S. Smith, *Modern Labor Economics*, Scott Foresman and Co. A good discussion of problems in the data can be found in the report of the *1979 National Commission on Employment and Unemployment Statistics*. The report contains a number of background papers in addition to the summary of recommendations.

The data series described in this article only hint at the large quantity of statistics that describe the labor market; many more series can be found in two monthly publications of the BLS. *Employment & Earnings* summarizes current and historical statistics collected from both the household and establishment surveys. The *Monthly Labor Review* also summarizes labor market statistics. It also contains articles that discuss many aspects of labor markets, data concepts, data collection procedures, and the series themselves; several of the articles were helpful in preparing this paper, such as an article contrasting the payroll and household estimates of employment in the August 1989 issue. Finally, the *BLS Handbook of Methods*, revised and published periodically, presents a discussion of the technical aspects of how the BLS collects, transforms, estimates, and presents labor market data.

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