

THE METHOD OF SEASONAL ADJUSTMENT FOR UNEMPLOYMENT AND OTHER LABOR FORCE SERIES

In accordance with its regular practice at the beginning of each year, the Bureau of Labor Statistics has recomputed and revised the seasonal adjustment factors for unemployment and other labor force series. The revisions incorporate data through December 1963 and are based on an improved method resulting from the Bureau's research activities during 1963. Combinations of directly adjusted component series are used in the same way as in 1963. The revised seasonal adjustment factors and seasonally adjusted data shown on pages v through xvii replace those listed in the March 1963 Employment and Earnings, which were based on data through December 1962.

Method of Adjustment

The seasonal adjustment method used for these series continues to be an adaptation of the traditional ratio-to-moving-average method, with allowance for changing seasonal patterns.

The original data are regarded as a product of a trend-cycle component times a seasonal component times an irregular component. The trend-cycle represents the "real" movement of the series, including cyclical movements. The seasonal component is the annually repetitive pattern which makes certain months consistently higher or lower than others. The irregular component is a residual, including sampling errors and short-term fluctuations which do not follow any consistent pattern. After a satisfactory decomposition is achieved, the seasonally adjusted series is computed by dividing each original value by the corresponding seasonal factor.

A centered 12-month moving average of the original data is used as the first estimate of the trend-cycle. This is divided into the original values to provide seasonal-irregulars. A weighted moving average of these seasonal-irregulars for the same month of successive years provides estimates of the seasonal factors. The new method uses seven (instead of the previous five) terms in this moving average. The quotient of each seasonal-irregular divided by the corresponding seasonal is an estimate of the irregular component, which at this stage includes some residual trend-cycle because of the insufficient flexibility of the 12-month moving average in representing the trend-cycle. These irregulars are then smoothed to provide a trend improvement factor which is multiplied by the 12-month moving average to yield a better trend-cycle. The new method uses nine (instead of the previous seven) terms in the weighted moving average for improving the trend-cycle component. A new decomposition based on the revised trend-cycle is computed in the same way as before.

This would end the process except for the problem of extreme values. Most series contain some values which do not quite fit the general pattern. Instead of the earlier procedure in which a borderline case may receive either drastic treatment or no treatment at all, the new method uses a graduated approach, with small differences in the data causing only small differences in the way they are treated.

The key idea in the graduated treatment of extreme values is the assignment of a "credence factor" to each data value. These credence factors, which range from zero to one, are used as secondary weights in the various moving averages. A value so extreme as to have zero credence has no effect on the trend-cycle or the seasonal factor; a value with partial credence has some effect but less than it had originally. The extremeness goes into the irregular component.

Many of the labor force series are seasonally adjusted by aggregation rather than directly. That is, parts of the labor force are adjusted directly and their seasonally adjusted values are then combined to provide seasonally adjusted values for the aggregates. Some of the unemployment rates are a quotient of one such aggregate divided by another. The twelve basic series are four age-sex groups (male and female, under and over 20 years of age) of unemployment, of nonagricultural employment, and of agricultural employment.

Historical Comparability

The data are based on the definitions of employment and unemployment adopted in January 1957.

Beginning in 1960, the data include Alaska and Hawaii; this should be taken into account in making comparisons with previous years. The inclusion of Alaska and Hawaii resulted in an increase of about 300,000 in the labor force, four-fifths of this in nonagricultural employment. The levels of other labor force categories were not appreciably changed.

Beginning in 1953, population data from the 1950 Census were introduced into the estimating procedure, affecting the comparability of the labor force figures with previous years. Labor force, total employment, and agricultural employment levels were raised by about 350,000, primarily affecting the figures for total and males. Other categories were relatively unaffected. Population data from the 1960 Census were introduced in April 1962. This change primarily affected the labor force and employment totals, which were reduced by about 200,000. The unemployment totals were virtually unchanged.

Data Published

As a result of new techniques and the conversion to a high-speed computer, the BLS is now able to process and publish up to 20 years of seasonally adjusted data compared with the previous limitation of 14 years on the former program. The current program also provides for the publication of annual averages for the first time, which are based on original data. Although civilian labor force and total employment are seasonally adjusted by the component method, direct adjustment factors are available upon request. Historical seasonal adjustment factors for other labor force series may also be obtained on request.

CURRENT SEASONAL ADJUSTMENT FACTORS FOR LABOR FORCE COMPONENTS

SERIES TITLE	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
UNEMPLOYED - MEN 20 YEARS AND OVER	127.0	128.6	123.6	105.2	91.1	90.2	90.8	90.6	79.4	78.8	88.8	106.0
UNEMPLOYED - WOMEN 20 YEARS AND OVER	109.2	107.9	103.4	96.3	93.8	101.1	100.7	100.2	101.0	96.7	99.9	89.7
UNEMPLOYED - BOYS 14-19 YEARS	87.9	96.0	93.5	90.3	96.5	182.0	133.3	98.4	78.8	78.4	77.4	87.4
UNEMPLOYED - GIRLS 14-19 YEARS	75.9	78.3	79.5	81.4	108.0	203.7	143.7	97.4	88.4	79.2	89.3	75.1
NONAGRICULTURAL EMPLOYMENT - MEN 20 YEARS AND OVER	98.4	98.6	98.8	99.5	100.1	100.8	100.6	100.9	100.9	101.0	100.6	100.0
NONAGRICULTURAL EMPLOYMENT - WOMEN 20 YEARS AND OVER	99.1	100.4	101.6	101.5	101.7	98.4	96.6	97.1	99.6	101.0	101.3	101.8
NONAGRICULTURAL EMPLOYMENT - BOYS 14-19 YEARS	85.2	88.4	85.0	90.1	98.8	118.9	131.9	130.4	95.8	93.5	91.2	90.9
NONAGRICULTURAL EMPLOYMENT - GIRLS 14-19 YEARS	90.2	90.9	92.1	89.7	92.3	103.5	122.0	121.6	94.8	99.3	97.5	106.1
AGRICULTURAL EMPLOYMENT - MEN 20 YEARS AND OVER	91.5	92.6	96.6	99.6	103.3	106.6	105.3	103.1	103.7	103.8	100.8	92.9
AGRICULTURAL EMPLOYMENT - WOMEN 20 YEARS AND OVER	62.0	61.8	74.6	81.8	111.6	139.0	129.8	113.5	132.0	130.7	99.0	64.3
AGRICULTURAL EMPLOYMENT - BOYS 14-19 YEARS	59.8	61.8	73.2	85.0	94.7	163.1	166.4	149.7	102.6	98.4	82.4	62.9
AGRICULTURAL EMPLOYMENT - GIRLS 14-19 YEARS	25.3	29.6	29.6	43.9	80.3	212.2	205.1	190.3	145.5	136.7	66.5	35.0
UNEMPLOYMENT RATE - MARRIED MEN	130.9	136.5	125.7	104.6	89.7	85.0	87.8	88.1	76.7	78.1	89.3	107.5
UNEMPLOYMENT RATE - EXPERIENCED WAGE AND SALARY WORKERS	120.5	122.9	115.4	101.3	92.8	98.7	94.3	92.3	87.6	84.1	91.6	98.3
PERCENT OF LABOR FORCE TIME LOST	112.5	113.8	108.7	98.8	92.3	109.6	102.5	97.8	86.3	84.4	95.7	97.3
UNEMPLOYED - LESS THAN 5 WEEKS	111.2	103.1	87.4	86.4	89.5	148.1	103.3	92.3	93.3	90.2	100.0	95.6
UNEMPLOYED - 5 TO 14 WEEKS	125.9	142.6	131.1	84.4	80.8	81.7	112.9	103.4	76.8	75.1	87.8	97.2
UNEMPLOYED - 15 WEEKS AND OVER	100.1	115.5	126.3	133.4	116.1	94.1	89.5	87.6	82.2	82.5	81.5	90.8
UNEMPLOYED - 27 WEEKS AND OVER	99.4	101.9	115.8	117.4	108.1	98.6	102.1	100.5	90.2	86.2	91.2	88.9
NONAGRICULTURAL WORKERS ON FULL-TIME SCHEDULES	99.3	99.2	99.8	100.5	101.2	100.6	95.0	96.9	101.5	102.2	102.1	102.1
NONAGRICULTURAL WORKERS ON PART TIME FOR ECONOMIC REASONS (USUALLY WORK FULL TIME)	110.4	95.5	102.9	106.2	99.9	98.9	88.2	100.4	98.7	96.1	104.0	98.5
NONAGRICULTURAL WORKERS ON PART TIME FOR ECONOMIC REASONS (USUALLY WORK PART TIME)	87.2	94.9	93.1	92.6	93.5	124.4	128.4	124.9	90.9	87.0	93.0	89.8
NONAGRICULTURAL WORKERS ON PART TIME FOR NONECONOMIC REASONS (USUALLY WORK PART TIME)	100.9	107.2	107.9	106.4	112.3	89.5	80.9	78.1	96.3	104.1	108.0	108.7