

### IMPORTANT FEATURES AND CHANGES FOR THIS ISSUE

A limited number of changes are made from time to time to reflect the change from one stage of the business cycle to another, to show new findings of business-cycle research and newly available economic series, or to emphasize the activity of a particular series or series group. Such changes may involve additions or deletions of series used, changes in placement in relation to other series, changes in components of indexes, etc. These changes will be listed in this section each month.

The following cyclical comparisons are made in this report:

1. Percentage changes in important business-cycle indicators from reference peak levels and reference trough dates (table 7)
2. Percentage changes from specific peak levels and specific trough dates (table 8)
3. Percentage changes from specific trough levels and specific trough dates (table 9)
4. Graphic comparisons from reference peak levels and reference trough dates (chart 4)
5. Graphic comparisons from specific trough levels and specific trough dates (chart 5)

## BUSINESS-CYCLE DEVELOPMENTS

### INTRODUCTION

This report has been prepared to bring together many of the available economic indicators in convenient form for analysis and interpretation by specialists in business-cycle analysis. The presentation and classification of series in this report follows the business indicators approach. The classification of series and the business-cycle turning dates are those designated by the National Bureau of Economic Research which, in recent years, has been the leader in this field of investigation.<sup>1</sup> However, this publication is not to be taken as implying acceptance or endorsement by the Bureau of the Census or any other government agency of any particular approach to business-cycle analysis. It is intended only to supplement other reports of the Department of Commerce that provide data for analyzing current business conditions.

The unique features are the arrangement of data according to their usual timing relations during the course of the business cycle and the inclusion of special analytical measures and historical cyclical comparisons that help in evaluating the current stage of the business cycle. Electronic computers are used for many of the computations.

The chief merits of this report are the speed with which the data for indicators are collected, assembled, and published, and the arrangement of the series for business-cycle studies. This report is scheduled for publication about the 20th of the month following the month of data.

Altogether about 70 principal indicators and about 350 components are used for the different measures shown. The movements of the series are shown against the background of the expansions and contractions of the general business cycle so that "leads" and "lags" can be readily detected and unusual cyclical developments spotted. The exact number of series included for the total and important classes of series may vary from month to month because of additions of new series and revisions in the composition of indexes. Almost all of the basic data are available in published reports. A complete list of the series and the sources of data is shown on the back cover of this report. All the data shown are seasonally adjusted where seasonal variations appear to exist.

<sup>1</sup>For further information about the National Bureau of Economic Research approach to business-cycle studies, see their publications, Business-Cycle Indicators, Princeton University Press, 1961, and "Signals of Recession and Recovery", Occasional Paper 77, National Bureau of Economic Research, New York, 1961. These publications also contain historical data for most business indicators included in this report.

### ORGANIZATION AND CONTENT OF THE REPORT

Three types of data are shown in this report. They are as follows:

Basic data (chart 1 and table 1).--Over 50 business-cycle indicators and 20 additional series with business-cycle significance are included. Together they provide a broad view of current and prospective business-cycle fluctuations in the economy as well as the basis for making an economic interpretation of these fluctuations.

Auxiliary measures (charts 2-3 and tables 2-6).--These are measures which aid in forming a judgment of (1) the magnitude of current changes compared to previous changes, (2) the imminence of a turning point in the business cycle, and (3) the extent of current changes in different parts of the economy. They also aid in pointing to developments in particular industries and places.

Cyclical patterns (charts 6-7 and tables 7-9).--The current cyclical change is compared with changes at corresponding stages of earlier cycles. These comparisons are made in different ways depending upon the phase of the business cycle.

In addition to the data shown as part of the regular report, certain appendix materials are presented. These materials include historical data, key information, and adjustment factors.

### DESCRIPTIONS AND PROCEDURES

#### Business-Cycle Series

The three major groups of series are those with a fairly consistent timing relation to the business cycle. They are grouped, in accordance with the National Bureau of Economic Research classification, as "leading," "roughly coincident," or "lagging" indicators. Additional series are also included for a more complete coverage of the national economy. The series are described as follows:

NBER Leading Indicators.--Around 30 series usually reach peaks or troughs before those in aggregate economic activity as measured by the roughly coincident series (see below). For this reason, they are designated as "leading" series. One group of these series pertains to activities in the labor market, another to orders and contracts, and so on.

NBER Roughly Coincident Indicators.--About 15 series are direct measures of aggregate economic activity or move roughly together with it; for example, nonagricultural employment, industrial production or retail sales. For this reason they are referred to as "roughly coincident" series.

NBER Lagging Indicators.--Some series, such as new plant and equipment expenditures and manu-

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facturers' inventories, usually have reached turning points after they were reached in aggregate economic activity, and for this reason, they are designated as "lagging" series.

Other series.--About 20 additional U.S. series with business-cycle significance are also shown. Some of these series, such as change in money supply, merchandise trade balance, and cash surplus or deficit, represent important factors in the economy, but they have not qualified as indicators for various reasons, such as irregularity in timing. Finally, industrial production indexes for several countries which have important trade relations with the United States are presented.

**Seasonal Adjustments**

Official seasonally adjusted data are used in this report wherever they are available. However, for the special purposes of business-cycle studies, a number of series that are not ordinarily published in seasonally adjusted form are shown on a seasonally adjusted basis in this report. These series are as follows:

2. Accession rate, manufacturing
3. Layoff rate, manufacturing
4. Number of persons on temporary layoffs, all industries
5. Initial claims for unemployment insurance, all State programs
13. Number of new business incorporations
14. Current liabilities of business failures
15. Number of business failures with liabilities of \$100,000 and over
18. Profits (before taxes) per dollar of sales, all manufacturing corporations
25. Change in manufacturers' unfilled orders, durable goods industries
30. Nonagricultural placements, all industries
45. Average weekly insured unemployment, all State programs
55. Index of wholesale prices, all commodities other than farm products and foods
66. Consumer installment debt
81. Index of consumer prices
82. Federal payments to the public
83. Federal receipts from the public
84. Net Federal budgetary surplus or deficit
90. Defense Department obligations, procurement
91. Defense Department obligations, total
92. Military prime contract awards to U.S. business firms
125. Germany--industrial production index
128. Japan--industrial production index

Seasonal adjustments for these series were developed by either the Bureau of the Census or the NBER. The adjustment factors used are shown in the appendix, table D. Seasonally adjusted data prepared by the collecting agency will be substituted for the series mentioned above whenever they are published.

**Designation of Business-Cycle Turning Points**

The historical business-cycle turning points are those designated by the National Bureau of Economic

Research. As a matter of general practice, a business-cycle turning point will not be designated until at least 6 months after it has occurred.

**Charts**

Shaded areas on the charts indicate periods of business-cycle contraction between reference dates for peaks ("P"--beginnings of shaded areas) and troughs ("T"--ends of shaded areas). The reference dates are those selected by the National Bureau of Economic Research and mark the approximate date when aggregate economic activity reached its high or low. Since a business-cycle turning point will not be designated until at least 6 months after it has occurred, the shading for a recession period will be entered only after a trough has been designated.

The month or quarter of the latest data plotted is indicated in a box near the end of each series. Months are indicated by Arabic numerals and quarters by Roman numerals. Quarterly series are identified by the letter "Q" and connected by broken lines. Monthly series are connected by solid lines.

**Auxiliary Measures of Current Changes**

Three kinds of auxiliary measures are presented--diffusion indexes, timing distributions, and direction-of-change tables. These measures aid in forming a judgment of the magnitude of current changes compared to previous changes, the imminence of a turning point in the business cycle, and the extent of current changes in different parts of the economy. They also point to developments in particular industries and places.

Diffusion indexes.--Diffusion indexes are simple summary measures of groups of economic series. They express, for a given group, the percent of the series which has risen over given intervals of time. Their turning points tend to lead the turning points of the aggregate and they measure how widespread a business change is. They vary between the limits of 100 (all components rising) and zero (all components falling). Widespread increases are often associated with rapid growth in aggregate activity and widespread declines with sharp reductions.

The diffusion indexes in this report are grouped according to the timing classification of the National Bureau of Economic Research. For monthly series, two comparison intervals are used: 1-month intervals (January-February, February-March, etc.) and 3-month intervals (January-April, February-May, etc.). The indexes based on 1-month intervals are more "current" but they are also more irregular than the 3-month indexes (see chart 2). Quarterly series are compared over 1-quarter intervals and 4-quarter intervals.

This report now includes 29 diffusion indexes. Of these, about 17 are based on different groupings, timing classifications, and comparison intervals, and utilize, in all, about 300 components. The 12 other diffusion indexes include the Chicago Purchasing Agents' Association index based on monthly reports of changes in profits; the First National City Bank of New York index based on quarterly profit

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reports; and 10 National Bureau of Economic Research diffusion indexes of actual and anticipated sales and new orders based on data from Dun and Bradstreet, Inc., actual and anticipated carloadings based on data from the Association of American Railroads, actual and anticipated new plant and equipment expenditures based on data from the Office of Business Economics and the Securities and Exchange Commission, and actual indexes of capital appropriations for 602 companies and 15 industries based on data from the National Industrial Conference Board.

Diffusion indexes constructed on the basis of current data are often highly irregular and require careful judgment in their use and interpretation.

Series numbers preceded by the letter "D" designate diffusion indexes. When one of these numbers corresponds to a basic indicator series number, it means that the diffusion index has been computed from components of the indicator series; for example, the diffusion index numbered "D6" is computed from components of series number 6. Diffusion indexes not computed from basic series components are assigned new numbers.

Timing distributions.--Distributions of current highs and lows appear to be helpful in identifying a turning point in the business cycle promptly after it occurs. Each month a timing distribution is constructed which shows the number of series reaching high (low) values during each of the recent expansion (contraction) months. The timing distribution is summarized by showing the number of series reaching new highs (lows) and the percent currently high (low) for each of several recent months (see table 3).

To compile timing distributions, the data for each of the 50 business-cycle indicators over the period of the current cyclical phase are scanned each month. During a business cycle contraction, the low value for each series is identified; during an expansion, the high value is identified. For inverted series, that is, series with negative conformity to the business cycle, high values are taken during contraction and low values during expansion. If the values for 2 or more months are equal, the latest date is taken as the low (high) month. In selecting these values, erratic values are disregarded, although it is, of course, difficult to identify an erratic value, particularly for the current month.

The "L" is used in the basic data table (table 1) to identify and highlight the current low values during contraction and the letter "H", to identify current high values during expansion. In addition, these symbols are used to identify the low values preceding current highs and high values preceding current lows. These identifications facilitate an economic interpretation of the timing distribution since they show which economic activities reached lows or highs in the several months.

These measures have been developed only recently, and experience may reveal a flaw or possible improvement in the techniques. For the present, interpretations must be made in light of the

fact that a contraction following a high value reached several months ago may be the result of an erratic fluctuation and that a new high may be reached in some future month. In short, when the percent currently high falls below 50 percent for both the leading and roughly coincident series, this does not necessarily signify that a business-cycle peak has occurred. It may do so, but it may also simply reflect a short reversal in the upward movement.

Direction-of-change tables.--Direction-of-change tables show directions of change ("+" for rising, "o" for unchanged, and "-" for falling) in the components used for the diffusion indexes. These tables provide a convenient view of changing business conditions and are helpful in making an economic interpretation of the movements in the more highly aggregated statistical measures. That is, they show which economic activities went up, which went down, and how long such movements have persisted. They also help to show how a recession or recovery spreads from one sector of the economy to another.

#### Comparisons of Cyclical Patterns

In forming a judgment about the current intensity and probable ultimate character of a cyclical fluctuation, some economists find it helpful to compare the behavior of the indicator series and diffusion indexes in the current business-cycle phase with their behavior during the corresponding phase of previous business cycles. These comparisons are made in different ways depending upon the phase of the business cycle.

Contractions are compared by computing changes over the span from the most recent business-cycle peak to the current month and over equal spans from previous reference peaks. This type of comparison is designated as representing changes from reference peak levels and from reference peak dates.

Expansions may be compared by measuring changes from the immediately preceding peak levels. In this report the current expansion is related to the May 1960 reference peak. For earlier expansions, percentage changes are also computed from their respective reference peaks to dates which are the same number of months beyond the succeeding reference troughs as the current expansion is beyond its reference trough. This type of comparison is designated as representing changes from reference peak levels and from reference trough dates. Although the spans from reference trough dates are the same for each expansion, the spans from the preceding peak dates are different, depending on the length of the contractions. This type of comparison answers the question whether, and by how much, the current level of activity exceeds or falls short of the level at the preceding business-cycle peak, a given number of months after the recovery began, and how the current situation compares in this respect with earlier recoveries.

Expansions also may be compared by computing changes from reference trough levels and from reference trough dates. This type of comparison meas-

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ures the extent of the rise from the trough level so many months after the upswing began.

In addition to comparing cyclical fluctuations on the basis of reference dates. (which are the same for all series), comparisons are made on the basis of specific peak and trough dates identified for each series. For example, the specific peak in retail sales corresponding to the May 1960 reference peak is April 1960; the specific peak in stock prices is July 1959.

Recent performance in several individual indicators is compared graphically with that in earlier business cycles. In making graphic comparisons, the reference peak or trough levels are set equal to 100, and the reference peak or trough dates are aligned depending on the phase of the business cycle.

In order to make historical comparisons, it is frequently necessary to use data for a closely re-

lated series for cycles prior to the initial date covered by the series used currently. Such comparisons are, therefore, to be considered only approximate. Nearly all series have undergone change in definition, coverage, or estimation procedure since 1919. The principal cases of this sort are as follows:

7. New private permanent nonfarm dwelling started (prior to 1939: Residential building contracts, floor space)
41. Number of employees in nonagricultural establishments (prior to 1929: Employment in manufacturing)
54. Sales of retail stores (prior to 1935: Department store sales)
62. Index of wage and salary cost per unit of output, total manufacturing (prior to 1946: Production worker wage cost per unit. Supplements to wages and salaries, which are a part of total labor cost, are not included).

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1. Two series, the average workweek (No. 1) and nonagricultural employment in establishments (No. 41) have been revised by the Bureau of Labor Statistics as a result of the introduction of a new 1959 benchmark and the conversion to the 1957 Standard Industrial Classification. Revised data for these series are plotted, from 1948 to date, in chart 1 and shown, from January 1959 to October 1961, in table 1. Revisions in the directions-of-change tables (tables 6A and 6F) and diffusion indexes (table 4), however, have been carried back to April 1961 only.

2. New private housing units authorized by local building permits (No. 29) has been converted to an index with 1957-59 as the comparison base. The average annual rate for the base period is 1,089 thousand permits.

3. Rates of change for 13 monthly and 10 quarterly business-cycle series have been added to table 2.

4. Appendix table A, which shows the reference dates and durations of historical business cycles, has been expanded to include the average duration of peacetime cycles.

# Business Cycle Developments

## INTRODUCTION

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Experimental work for this report was carried out in collaboration with the NBER which is responsible for much of the early research in this field. Their background paper, Signals of Recession and Recovery, contains a more detailed description of the measures used, additional historical data, and the history of the development of the techniques employed. This paper (by Julius Shiskin) was published as Occasional Paper 77 of the National Bureau of Economic Research, 261 Madison Avenue, New York 16, N.Y. (207 pages, price \$3).

on the back cover of this report. All the data shown are seasonally adjusted where seasonal variations appear to exist.

## ORGANIZATION AND CONTENT OF THE REPORT

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Analytical measures (charts 2-3 and tables 2-6).--These are measures which aid in forming a judgment of (1) the magnitude of current changes compared to previous changes, (2) the imminence of a turning point in the business cycle, and (3) the extent of current changes in different parts of the economy. They also aid in pointing to developments in particular industries and places.

Cyclical patterns (charts 6-7 and tables 7-9).--The current cyclical change is compared with changes at corresponding stages of earlier cycles. These comparisons are made in different ways depending upon the phase of the business cycle.

In addition to the data shown as part of the regular report, certain appendix materials are presented. These materials include historical data, key information, and adjustment factors.

## DESCRIPTIONS AND PROCEDURES

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NBER Roughly Coincident Indicators.--About 15 series are direct measures of aggregate economic activity or move roughly together with it; for example, nonagricultural employment, industrial production or retail sales. For this reason they are referred to as "roughly coincident" series.

## Descriptions and Procedures

**NBER Lagging Indicators.**--Some series, such as new plant and equipment expenditures and manufacturers' inventories, usually have reached turning points after they were reached in aggregate economic activity, and for this reason, they are designated as "lagging" series.

**Other series.**--About 20 additional U.S. series with business-cycle significance are also shown. Some of these series, such as change in money supply, merchandise trade balance, and cash surplus or deficit, represent important factors in the economy, but they have not qualified as indicators for various reasons, such as irregularity in timing. Finally, industrial production indexes for several countries which have important trade relations with the United States are presented.

### Seasonal Adjustments

Official seasonally adjusted data are used in this report wherever they are available. However, for the special purposes of business-cycle studies, around 20 series that are not ordinarily published in seasonally adjusted form are shown on a seasonally adjusted basis in this report. These series are as follows:

2. Accession rate, manufacturing
3. Layoff rate, manufacturing
4. Number of persons on temporary layoff, all industries
5. Initial claims for unemployment insurance, State programs
13. Number of new business incorporations
14. Current liabilities of business failures
15. Number of business failures with liabilities of \$100,000 and over
18. Profits (before taxes) per dollar of sales, all manufacturing corporations
25. Change in manufacturers' unfilled orders, durable goods industries
30. Nonagricultural placements, all industries
45. Average weekly insured unemployment, State programs
55. Index of wholesale prices, all commodities other than farm products and foods
66. Consumer installment debt, end of month
81. Index of consumer prices
82. Federal payments to the public
83. Federal receipts from the public
84. Net Federal cash surplus or deficit
90. Defense Department obligations, procurement
91. Defense Department obligations, total
92. Military prime contract awards to U.S. business firms
125. West Germany, index of industrial production
128. Japan, index of industrial production

Seasonal adjustments for these series were developed by either the Bureau of the Census or the NBER. The adjustment factors used are shown in the appendix, table D. Seasonally adjusted data prepared by the collecting agency will be substituted for the series mentioned above whenever they are published.

### Designation of Business-Cycle Turning Points

The historical business-cycle turning points are those designated by the National Bureau of Economic Research. They mark the approximate date when aggregate economic activity reached its cyclical high or low levels. As a matter of general practice, a business-cycle turning point will not be designated until at least 6 months after it has occurred.

### Charts

Shaded areas on the charts indicate periods of business-cycle contraction between reference dates for peaks ("P"—beginnings of shaded areas) and troughs ("T"—ends of shaded areas). The shading for a recession period will be entered only after a trough has been designated.

The month or quarter of the latest data plotted is indicated in a box near the end of each series. Months are indicated by Arabic numerals and quarters by Roman numerals. Quarterly series are identified by the letter "Q" and connected by broken lines. Monthly series are connected by solid lines.

### Analytical Measures of Current Change

Four kinds of analytical measures are presented—rates of change, diffusion indexes, timing distributions, and direction-of-change tables. These measures aid in forming a judgment of the magnitude of current changes compared to previous changes, the imminence of a turning point in the business cycle, and the extent of current changes in different parts of the economy. They also point to developments in particular industries and places.

**Rates of change.**--There is considerable interest in the rate of acceleration during expansions and the rate of retardation during recessions. For this reason, rates of change for the principal monthly and quarterly business cycle series are included in table 2 of this report. Rates of change are helpful in judging and appraising trends of acceleration or retardation in a current business cycle phase, despite the fact that the erratic nature of month-to-month rates of change often makes it difficult to detect the significance of a change until some months after it has occurred. For series, such as unemployment and layoffs, which usually move down during expansions and up during recessions, the changes are inverted so that rises are shown as declines and vice versa.

**Diffusion indexes.**--Diffusion indexes are simple summary measures of groups of economic series. They express, for a given group, the percent of the series which has risen over given intervals of time. Their turning points tend to lead the turning points of the aggregate and they measure how widespread a business change is. They vary between the limits of 100 (all components rising) and zero (all components falling). Widespread increases are often associated with rapid growth in aggregate activity and widespread declines with sharp reductions.

The diffusion indexes in this report are grouped according to the timing classification of the National Bureau of Economic Research. For monthly series, two comparison intervals are used: 1-month intervals (January-February, February-March, etc.) and 3-month intervals (January-April, February-May, etc.). The indexes based on 1-month intervals are more "current" but they are also more irregular than the 3-month indexes (see chart 2). Quarterly series are compared over 1-quarter intervals and 4-quarter intervals.

This report includes 29 diffusion indexes. Seventeen of these indexes utilize 300 components of 9 principal indicators. For 8 of these indicators, the components are compared over 3-month as well as 1-month spans, while for 1 of them, comparisons are made over 1-month spans only. The 12 other diffusion indexes are based on 7 series which are closely related to the principal indicators. They include the Chicago Purchasing Agents Association index based on monthly reports of changes in profits (200 companies), the First National City Bank of New York index based on quarterly profit reports (600 companies), and 10 NBER diffusion indexes, as follows: Manufacturers' actual and anticipated sales (800 companies) and actual and anticipated new orders (400 companies), based on data from Dun and Bradstreet, Inc.; actual and anticipated carloadings (19 commodity groups), based on data from the Association of American Railroads; actual and anticipated new plant and equipment expenditures (16 industries), based on data from Office of Business Economics and the Securities and Exchange Commission; and actual indexes of capital appropriations for 602 companies and for 15 industries, based on data from the National Industrial Conference Board.

Diffusion indexes constructed on the basis of current data are often highly irregular and require careful judgment in their use and interpretation.

Series numbers preceded by the letter "D" designate diffusion indexes. When one of these numbers corresponds to a basic indicator series number, it means that the diffusion index has been computed from components of the indicator series; for example, the diffusion index numbered "D6" is computed from components of series number 6. Diffusion indexes not computed from basic series components are assigned new numbers.

Timing distributions. --Distributions of current highs and lows appear to be helpful in identifying a turning point in the business cycle promptly after it occurs. Each month a timing distribution is constructed which shows the number of series reaching high (low) values during each of the recent expansion (contraction) months. The timing distribution is summarized by showing the number of series reaching new highs (lows) and the percent currently high (low) for each of several recent months (see table 3).

To compile timing distributions, the data for each of the 50 business-cycle indicators over the period

of the current cyclical phase are scanned each month. During a business cycle contraction, the low value for each series is identified; during an expansion, the high value is identified. For inverted series, that is, series with negative conformity to the business cycle, high values are taken during contraction and low values during expansion. If the values for 2 or more months are equal, the latest date is taken as the low (high) month. In selecting these values, erratic values are disregarded, although it is, of course, difficult to identify an erratic value, particularly for the current month.

The letter "L" is used in the basic data table (table 1) to identify and highlight the current low values during contraction and the letter "H", to identify current high values during expansion. In addition, these symbols are used to identify the low values preceding current highs and high values preceding current lows. These identifications facilitate an economic interpretation of the timing distribution since they show which economic activities reached lows or highs in the several months.

Interpretations of timing distributions must be made in light of the fact that a contraction following a high value reached several months ago may be the result of an erratic fluctuation and that a new high may be reached in some future month. In short, when the percent currently high falls below 50 percent for both the leading and roughly coincident series, this does not necessarily signify that a business-cycle peak has occurred. It may do so, but it may also simply reflect a short reversal in the upward movement.

Direction-of-change tables. --Direction-of-change tables show directions of change ("+" for rising, "o" for unchanged, and "-" for falling) in the components used for the diffusion indexes. These tables provide a convenient view of changing business conditions and are helpful in making an economic interpretation of the movements in the more highly aggregated statistical measures. That is, they show which economic activities went up, which went down, and how long such movements have persisted. They also help to show how a recession or recovery spreads from one sector of the economy to another.

#### Comparisons of Cyclical Patterns

In forming a judgment about the current intensity and probable ultimate character of a cyclical fluctuation, some economists find it helpful to compare the behavior of the indicator series and diffusion indexes in the current business-cycle phase with their behavior during the corresponding phase of previous business cycles. These comparisons are made in different ways depending upon the phase of the business cycle.

Contractions are compared by computing changes over the span from the most recent business-cycle peak to the current month and over equal spans from previous reference peaks. This type of comparison is designated as representing changes from reference peak levels and from reference peak dates.

## Descriptions and Procedures

Expansions may be compared by measuring changes from the immediately preceding peak levels. In this report the current expansion is related to the May 1960 reference peak. For earlier expansions, percentage changes are also computed from their respective reference peaks to dates which are the same number of months beyond the succeeding reference troughs as the current expansion is beyond its reference trough. This type of comparison is designated as representing changes computed from reference peak levels and from reference trough dates. Although the spans from reference trough dates are the same for each expansion, the spans from the preceding peak dates are different, depending on the length of the contractions. This type of comparison answers the question whether, and by how much, the current level of activity exceeds or falls short of the level at the preceding business-cycle peak, a given number of months after the recovery began, and how the current situation compares in this respect with earlier recoveries.

Expansions also may be compared by computing changes from reference trough levels and from reference trough dates. This type of comparison measures the extent of the rise from the trough level so many months after the upswing began.

In addition to comparing cyclical fluctuations on the basis of reference dates (which are the same for all series), comparisons are made on the basis of specific peak and trough dates identified for each series. For example, the specific peak in retail

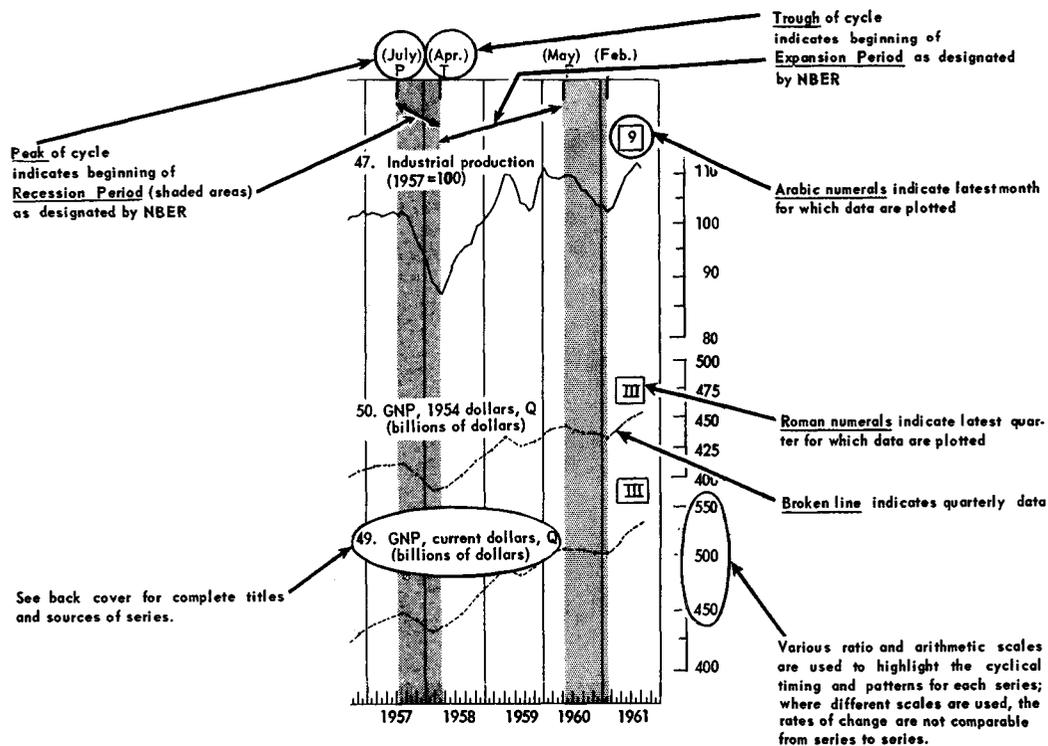
sales corresponding to the May 1960 reference peak is April 1960; the specific peak in stock prices is July 1959.

Recent performance in several individual indicators is compared graphically with that in earlier business cycles. In making graphic comparisons, the reference peak or trough levels are set equal to 100, and the reference peak or trough dates are aligned depending on the phase of the business cycle.

In order to make historical comparisons, it is frequently necessary to use data for a closely related series for cycles prior to the initial date covered by the series used currently. Such comparisons are, therefore, to be considered only approximate. Nearly all series have undergone change in definition, coverage, or estimation procedure since 1919. The principal cases of this sort are as follows:

7. New private permanent nonfarm dwelling units started (prior to 1939: Residential building contracts, floor space)
41. Number of employees in nonagricultural establishments (prior to 1929: Employment in manufacturing)
54. Sales of retail stores (prior to 1935: Department store sales)
62. Index of wage and salary cost per unit of output, total manufacturing (prior to 1946: Production worker wage cost per unit. Supplements to wages and salaries, which are a part of total labor cost, are not included).

HOW TO READ THE TIME SERIES CHARTS (CHARTS 1-3)



### IMPORTANT FEATURES AND CHANGES FOR THIS ISSUE

A limited number of changes are made from time to time to reflect the change from one stage of the business cycle to another, to show new findings of business cycle research and newly available economic series, or to emphasize the activity of a particular series or series group. Such changes may involve additions or deletions of series used, changes in placement in relation to other series, changes in components of indexes, etc. These changes will be listed in this section each month. The changes made in this issue are as follows:

1. The series on wholesale price index, excluding farm products and foods (series 55) has been eliminated from chart 5 because of difficulties in designating specific cycles during the post-World War II period. The series on labor income in mining, manufacturing, and construction (series 53) has been added to chart 5 and to table 8.

2. Two series, accession rate (No. 2) and layoff rate (No. 3), which were formerly seasonally adjusted by the Bureau of the Census, have recently been revised and published in seasonally adjusted form by the Bureau of Labor Statistics. The revised data for these series are plotted in chart 1 from January 1948 to September 1961 and are shown in table 1 from January 1959 to September 1961. The seasonal factors are no longer shown in appendix table E, but can be obtained from the Bureau of Labor Statistics.

3. Table 3, which has shown the distribution of highs and percent currently high for selected months in the current expansion, has been revised to include the percent of series currently high for comparable months (in relation to the reference trough) of three post-World War II expansions.

4. A table showing "specific" peak and trough dates for selected business indicators has been added to the appendix (table B).

Experimental work for this report was carried out in collaboration with the NBER which is responsible for much of the early research in this field. Their background paper, Signals of Recession and Recovery, contains an explanation of research findings helpful in interpreting current cyclical trends, a more detailed description of the indicators and measures used, and additional historical data. This paper (by Julius Shiskin) was published as Occasional Paper 77 of the National Bureau of Economic Research, 261 Madison Avenue, New York 16, N.Y. (207 pages, price \$3).

# Business Cycle Developments

## INTRODUCTION

This report has been prepared to bring together many of the available economic indicators in convenient form for analysis and interpretation by specialists in business cycle analysis. The presentation and classification of series in this report follows the business indicators approach. The classification of series and the business cycle turning dates are those designated by the National Bureau of Economic Research (NBER) which, in recent years, has been the leader in this field of investigation. However, this publication is not to be taken as implying acceptance or endorsement by the Bureau of the Census or any other government agency of any particular approach to business cycle analysis. It is intended only to supplement other reports of the Department of Commerce that provide data for analyzing current business conditions.

The unique features are the arrangement of data according to their usual timing relations during the course of the business cycle and the inclusion of special analytical measures and historical cyclical comparisons that help in evaluating the current stage of the business cycle.

The chief merits of this report are the speed with which the data for indicators are collected, assembled, and published and the arrangement of the series for business cycle studies. Electronic computers are used for many of the computations, thus making early publication possible. Publication is scheduled for about the 20th of the month following the month of data.

About 70 principal indicators and over 300 components are used for the different measures shown. The movements of the series are shown against the background of the expansions and contractions of the general business cycle so that "leads" and "lags" can be readily detected and unusual cyclical developments spotted. The exact number of series included for the total and important classes of series may vary from month to month because of additions of new series and revisions in the composition of indexes. Almost all of the basic data are available in published reports. A complete list of the series and the sources of data is shown on the back cover of this report. All the data shown are seasonally adjusted where seasonal variations appear to exist.

## ORGANIZATION AND CONTENT OF THE REPORT

Three types of data are shown in this report. They are as follows:

Basic data (chart 1 and table 1).—Over 50 business cycle indicators and 20 additional series with business cycle significance are included. Together they provide a broad view of current and prospective business cycle fluctuations in the economy as well as the basis for making an economic interpretation of these fluctuations.

Analytical measures (charts 2-3 and tables 2-6).—These are measures which aid in forming a judgment of (1) the magnitude of current changes compared to previous changes, (2) the imminence of a turning point in the business cycle, and (3) the extent of current changes in different parts of the economy. They also aid in pointing to developments in particular industries and places.

Cyclical patterns (charts 4-5 and tables 7-8).—The current cyclical change is compared with changes at corresponding stages of earlier cycles. These comparisons are made in different ways depending upon the phase of the business cycle.

In addition to the data shown as part of the regular report, certain appendix materials are presented. These materials include historical data, key information, and adjustment factors.

## DESCRIPTIONS AND PROCEDURES

### Business Cycle Series

The three major groups of series are those with a fairly consistent timing relation to the business cycle. They are grouped, in accordance with the NBER classification, as "leading," "roughly coincident," or "lagging" indicators. Additional series are also included for a more complete coverage of the national economy. The series are described as follows:

NBER Leading Indicators.—Around 30 series usually reach peaks or troughs before those in aggregate economic activity as measured by the roughly coincident series (see below). For this reason, they are designated as "leading" series. One group of these series pertains to activities in the labor market, another to orders and contracts, and so on.

NBER Roughly Coincident Indicators.—About 15 series are direct measures of aggregate economic activity or move roughly together with it; for example, nonagricultural employment, industrial production or retail sales. For this reason they are referred to as "roughly coincident" series.

NBER Lagging Indicators.—Some series, such as new plant and equipment expenditures and manufacturers' inventories, usually have reached turning points after they were reached in aggregate economic activity, and for this reason, they are designated as "lagging" series.

Other series.—About 20 additional U.S. series with business cycle significance are also shown. Some of these series, such as change in money supply, merchandise trade balance, and cash surplus or deficit, represent important factors in the economy, but they have not qualified as indicators for various reasons, such as irregularity in timing. Finally, industrial production indexes for several countries which have important trade relations with the United States are presented.

## Descriptions and Procedures

### Seasonal Adjustments

Official seasonally adjusted data are used in this report wherever they are available. However, for the special purposes of business cycle studies, a number of series that are not ordinarily published in seasonally adjusted form are shown on a seasonally adjusted basis in this report. These series are as follows:

4. Number of persons on temporary layoff, all industries
5. Initial claims for unemployment insurance, State programs
13. Number of new business incorporations
14. Current liabilities of business failures
15. Number of business failures with liabilities of \$100,000 and over
18. Profits (before taxes) per dollar of sales, all manufacturing corporations
25. Change in manufacturers' unfilled orders, durable goods industries
30. Nonagricultural placements, all industries
45. Average weekly insured unemployment, State programs
55. Index of wholesale prices, all commodities other than farm products and foods
66. Consumer installment debt, end of month
81. Index of consumer prices
82. Federal payments to the public
83. Federal receipts from the public
84. Federal cash surplus or deficit
90. Defense Department obligations, procurement
91. Defense Department obligations, total
92. Military prime contract awards to U.S. business firms
125. West Germany, index of industrial production
128. Japan, index of industrial production

Seasonal adjustments for these series were developed by either the Bureau of the Census or the NBER. The adjustment factors used are shown in the appendix, table E. Seasonally adjusted data prepared by the collecting agency will be substituted for the series mentioned above whenever they are published.

### Designation of Business Cycle Turning Points

The historical business cycle turning points are those designated by the NBER. They mark the approximate date when aggregate economic activity reached its cyclical high or low levels. As a matter of general practice, a business cycle turning point will not be designated until at least 6 months after it has occurred.

### Charts

Shaded areas on the charts indicate periods of business cycle contraction between reference dates for peaks ("P"—beginnings of shaded areas) and troughs ("T"—ends of shaded areas). The shading for a recession period will be entered only after a trough has been designated.

The month or quarter of the latest data plotted is indicated in a box near the end of each series. Months are indicated by Arabic numerals and quarters by Roman numerals. Quarterly series are

identified by the letter "Q" and connected by broken lines. Monthly series are connected by solid lines.

### Analytical Measures of Current Change

Four kinds of analytical measures are presented—rates of change, diffusion indexes, timing distributions, and direction-of-change tables. These measures aid in forming a judgment of the magnitude of current changes compared to previous changes, the imminence of a turning point in the business cycle, and the extent of current changes in different parts of the economy. They also point to developments in particular industries and places.

**Rates of change.**—There is considerable interest in the rate of acceleration during expansions and the rate of retardation during recessions. For this reason, rates of change for the principal monthly and quarterly business cycle series are included in table 2 of this report. Rates of change are helpful in judging and appraising trends of acceleration or retardation in a current business cycle phase, despite the fact that the erratic nature of month-to-month rates of change often makes it difficult to determine the significance of a change until some months after it has occurred. For series, such as unemployment and layoffs, which usually move down during expansions and up during recessions, the changes are inverted so that, in table 2, rises are shown as declines and declines as rises.

**Diffusion indexes.**—Diffusion indexes are simple summary measures of groups of economic series. They express, for a given group, the percent of the series which has risen over given intervals of time. Their turning points tend to lead the turning points of the aggregate and they measure how widespread a business change is. They vary between the limits of 100 (all components rising) and zero (all components falling). Widespread increases are often associated with rapid growth in aggregate activity, and widespread declines with sharp reductions.

The diffusion indexes in this report are grouped according to the timing classification of the NBER. For monthly series, two comparison intervals are used: 1-month intervals (January-February, February-March, etc.) and 3-month intervals (January-April, February-May, etc.). The indexes based on 1-month intervals are more "current" but they are also more irregular than the 3-month indexes (see chart 2). Quarterly series are compared over 1-quarter intervals and 4-quarter intervals.

This report includes 29 diffusion indexes. Seventeen of these indexes utilize 300 components of 9 principal indicators. For 8 of these indicators, the components are compared over 3-month as well as 1-month spans, while for 1 of them, comparisons are made over 1-month spans only. The 12 other diffusion indexes are based on 7 series which are closely related to the principal indicators. They include the Chicago Purchasing Agents Association index based on monthly reports of changes in profits (200 companies), the First National City Bank of New York index based on quarterly profit reports (600 companies), and 10 NBER diffusion indexes, as follows: Manufacturers' actual and anticipated sales (800 companies) and actual and anticipated

new orders (400 companies), based on data from Dun and Bradstreet, Inc.; actual and anticipated carloadings (19 commodity groups), based on data from the Association of American Railroads; actual and anticipated new plant and equipment expenditures (16 industries), based on data from Office of Business Economics and the Securities and Exchange Commission; and actual indexes of capital appropriations for 602 companies and for 15 industries, based on data from the National Industrial Conference Board.

Diffusion indexes constructed on the basis of current data are often highly irregular and require careful judgment in their use and interpretation.

Series numbers preceded by the letter "D" designate diffusion indexes. When one of these numbers corresponds to a basic indicator series number, it means that the diffusion index has been computed from components of the indicator series; for example, the diffusion index numbered "D6" is computed from components of series number 6. Diffusion indexes not computed from basic series components are assigned new numbers.

Timing distributions.—Distributions of current "highs" and "lows" appear to be helpful in identifying a turning point in the business cycle promptly after it occurs. Each month a timing distribution is constructed which shows the number of series reaching high (low) values during each of the recent expansion (contraction) months. The timing distribution is summarized by showing the number of series reaching new highs (lows) and the percent currently high (low) for each of several recent months (see table 3).

To compile timing distributions, the data for each of the 50 business cycle indicators over the period of the current cyclical phase are scanned each month. During a business cycle contraction, the low value for each series is identified; during an expansion, the high value is identified. For inverted series, that is, series with negative conformity to the business cycle, high values are taken during contraction and low values during expansion. If the values for 2 or more months are equal, the latest date is taken as the low (high) month. In selecting these values, erratic values are disregarded, although it is, of course, difficult to identify an erratic value, particularly for the current month.

The letter "L" is used in the basic data table (table 1) to identify and highlight the current low values during contraction and the letter "H", to identify current high values during expansion. In addition, these symbols are used to identify the low values preceding current highs and high values preceding current lows. These identifications facilitate an economic interpretation of the timing distribution since they show the months in which economic activities reached their lows or highs.

Interpretations of timing distributions must be made in light of the fact that a contraction following a high value reached several months ago may be the result of an erratic fluctuation and that a new high may be reached in some future month. In short, when the percent currently high falls below

50 percent for both the leading and roughly coincident series, this does not necessarily signify that a business cycle peak has occurred. It may do so, but it may also simply reflect a short reversal in the upward movement.

Direction-of-change tables.—Direction-of-change tables show directions of change ("+" for rising, "o" for unchanged, and "-" for falling) in the components used for the diffusion indexes. These tables provide a convenient view of changing business conditions and are helpful in making an economic interpretation of the movements in the more highly aggregated statistical measures. That is, they show which economic activities went up, which went down, and how long such movements have persisted. They also help to show how a recession or recovery spreads from one sector of the economy to another.

### Comparisons of Cyclical Patterns

In forming a judgment about the current intensity and probable ultimate character of a cyclical fluctuation, some economists find it helpful to compare the behavior of the indicator series and diffusion indexes in the current business cycle phase with their behavior during the corresponding phase of previous business cycles. These comparisons are made in different ways depending upon the phase of the business cycle.

Contractions are compared by computing changes over the span from the most recent business cycle peak to the current month and over equal spans from previous reference peaks. This type of comparison is designated as representing changes from reference peak levels and from reference peak dates.

Expansions may be compared by measuring changes from the immediately preceding peak levels. In this report the current expansion is related to the May 1960 reference peak. For earlier expansions, percentage changes are also computed from their respective reference peaks to dates which are the same number of months beyond the succeeding reference troughs as the current expansion is beyond its reference trough. This type of comparison is designated as representing changes computed from reference peak levels and from reference trough dates. Although the spans from reference trough dates are the same for each expansion, the spans from the preceding peak dates are different, depending on the length of the contractions. This type of comparison answers the question whether, and by how much, the current level of activity exceeds or falls short of the level at the preceding business cycle peak, a given number of months after the recovery began, and how the current situation compares in this respect with earlier recoveries.

Expansions also may be compared by computing changes from reference trough levels and from reference trough dates. This type of comparison measures the extent of the rise from the trough level so many months after the upswing began.

In addition to comparing cyclical fluctuations on the basis of reference dates (which are the same for all series), comparisons are made on the basis of specific peak and trough dates identified for each

Descriptions and Procedures

series. For example, the specific peak in retail sales corresponding to the May 1960 reference peak is April 1960; the specific peak in stock prices is July 1959.

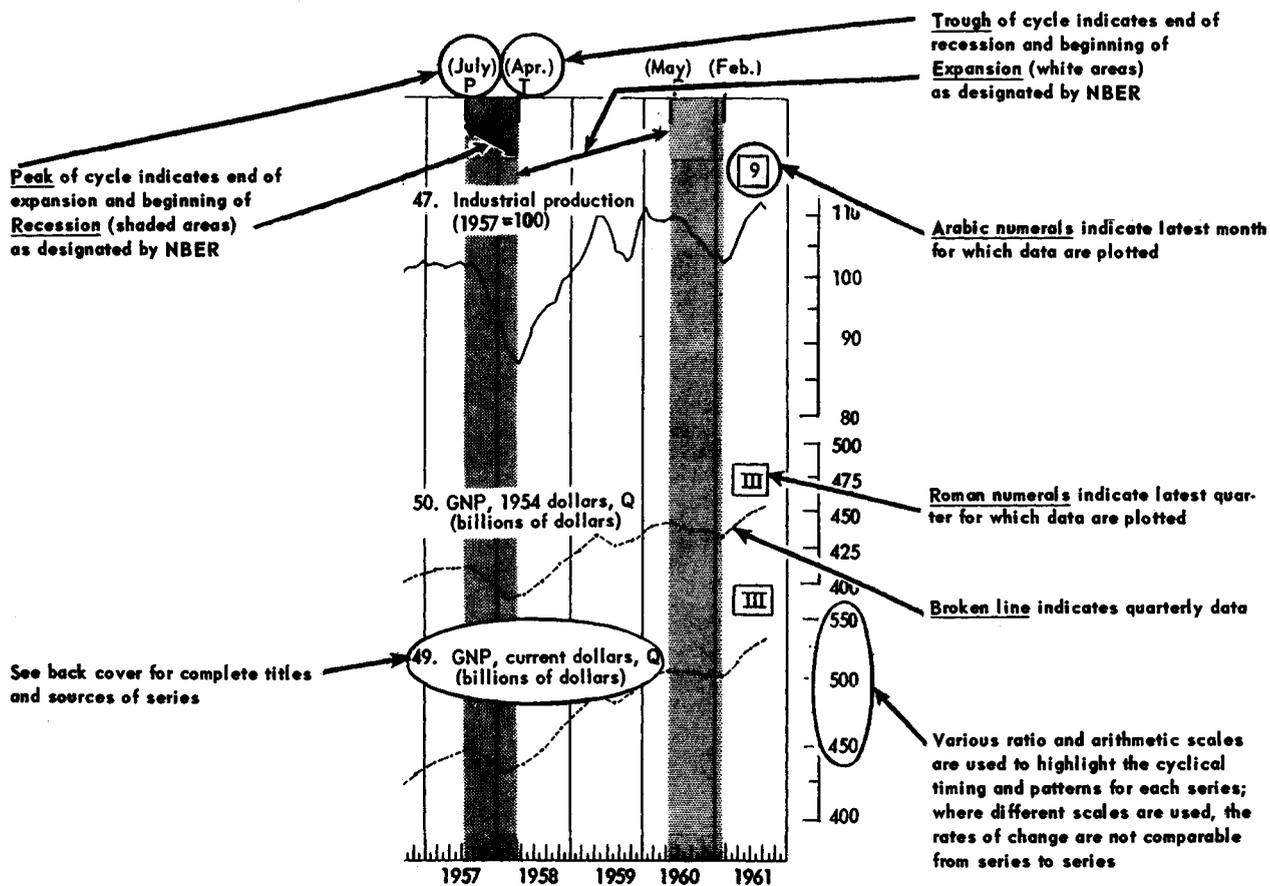
Recent performance in several individual indicators is compared graphically with that in earlier business cycles. In making graphic comparisons, the reference peak or trough levels are set equal to 100, and the reference peak or trough dates are aligned depending on the phase of the business cycle.

In order to make historical comparisons, it is frequently necessary to use data for a closely related series for cycles prior to the initial date covered by the series used currently. Such comparisons are, therefore, to be considered only approximate. Nearly all series have undergone change in

definition, coverage, or estimation procedure since 1919. The principal cases of this sort are as follows:

- 7. New private permanent nonfarm dwelling units started (prior to 1939: Residential building contracts, floor space)
- 41. Number of employees in nonagricultural establishments (prior to 1929: Employment in manufacturing)
- 52. Personal income (prior to 1929: Quarterly data as published by Barger and Klein)
- 54. Sales of retail stores (prior to 1935: Department store sales)
- 62. Index of wage and salary cost per unit of output, total manufacturing (prior to 1946: Production worker wage cost per unit. Supplements to wages and salaries, which are a part of total labor cost, are not included).

HOW TO READ THE TIME SERIES CHARTS (CHARTS 1-3)



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1. The quarterly series measuring the surplus or deficit on Federal income and product account (series No. 95) has been added to supplement the data on Federal cash payments and receipts. These series are all classified in the group "Other U.S. series with business cycle significance."

2. The seasonal adjustment for wholesale price index, excluding farm products and food (series No. 55) has been revised in order to reflect its recent seasonal pattern more accurately.

3. Total consumer installment credit (series No. 66) has been revised back to January 1955 by the Federal Reserve System. To obtain the seasonally adjusted figures from February 1955, the Federal Reserve System's seasonally adjusted net change in total outstanding consumer installment credit (extensions minus repayments) is added to the previous month's seasonally adjusted total. For earlier years, the Census adjustment of the aggregate is used.

4. Change in book value of manufacturing and trade inventories (series No. 31) has been revised as a result of the Office of Business Economic's revision of the series on total manufacturing and trade inventories back to 1946.

5. Various scales are used for the different series in chart 1. Beginning in this issue, the type of scale used for each series will be identified by a code placed next to the actual scale used. The types of scales are shown by code number on page 4.

### NOTICE TO SUBSCRIBERS

Airmail delivery.—To answer requests for prompt receipt of this report, airmail delivery in the United States has been arranged at an additional charge of \$5.25 per year. All correspondence about this service should be addressed to the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C.

Background materials.—Experimental work for this report was carried out in collaboration with the NBER which is responsible for much of the early research in this field. The paper, "Signals of Recession and Recovery," contains an explanation of research findings helpful in interpreting current cyclical trends, a more detailed description of the indicators and measures used, and additional historical data. This paper was issued as Occasional Paper 77 of the National Bureau of Economic Research, 261 Madison Avenue, New York 16, N.Y. (207 pages, price \$3).

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## ORGANIZATION AND CONTENT OF THE REPORT

Three types of data are shown in this report. They are as follows:

**Basic data** (chart 1 and table 1).—Over 50 business cycle indicators and 20 additional series with business cycle significance are included. Together they provide a broad view of current and prospective business cycle fluctuations in the economy as well as the basis for making an economic interpretation of these fluctuations.

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In addition to the data shown as part of the regular report, certain appendix materials are presented. These materials include historical data, key information, and adjustment factors.

## DESCRIPTIONS AND PROCEDURES

### Business Cycle Series

The three major groups of series are those with a fairly consistent timing relation to the business cycle. They are grouped, in accordance with the NBER classification, as "leading," "roughly coincident," or "lagging" indicators. Additional series are also included for a more complete coverage of the national economy. The series are described as follows:

**NBER Leading Indicators**.—Around 30 series usually reach peaks or troughs before those in aggregate economic activity as measured by the roughly coincident series (see below). For this reason, they are designated as "leading" series. One group of these series pertains to activities in the labor market, another to orders and contracts, and so on.

**NBER Roughly Coincident Indicators**.—About 15 series are direct measures of aggregate economic activity or move roughly together with it; for example, nonagricultural employment, industrial production or retail sales. For this reason they are referred to as "roughly coincident" series.

**NBER Lagging Indicators**.—Some series, such as new plant and equipment expenditures and manufacturers' inventories, usually have reached turning points after they were reached in aggregate economic activity, and for this reason, they are designated as "lagging" series.

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## Descriptions and Procedures

### Seasonal Adjustments

Official seasonally adjusted data are used in this report wherever they are available. However, for the special purposes of business cycle studies, a number of series that are not ordinarily published in seasonally adjusted form are shown on a seasonally adjusted basis in this report. These series are as follows:

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Seasonal adjustments for these series were developed by either the Bureau of the Census or the NBER. The adjustment factors used are shown in the appendix, table E. Seasonally adjusted data prepared by the collecting agency will be substituted for the series mentioned above whenever they are published.

### Designation of Business Cycle Turning Points

The historical business cycle turning points are those designated by the NBER. They mark the approximate date when aggregate economic activity reached its cyclical high or low levels. As a matter of general practice, a business cycle turning point will not be designated until at least 6 months after it has occurred.

### Charts

Time series line charts (charts 1-3) are used to show the cyclical timing and pattern of each series. Since various ratio and arithmetic scales are used, rates of change are not comparable except for those series having the same scale. See the diagram, page 4, for additional help in using the charts.

Shaded areas on the charts indicate periods of business cycle contraction between reference dates for peaks ("P"—beginnings of shaded areas) and troughs ("T"—ends of shaded areas). The shading

for a recession period will be entered only after a trough has been designated.

### Analytical Measures of Current Change

Four kinds of analytical measures are presented—rates of change, diffusion indexes, timing distributions, and direction-of-change tables. These measures aid in forming a judgment of the magnitude of current changes compared to previous changes, the imminence of a turning point in the business cycle, and the extent of current changes in different parts of the economy. They also point to developments in particular industries and places.

Rates of change.—There is considerable interest in the rate of acceleration during expansions and the rate of retardation during recessions. For this reason, rates of change for the principal monthly and quarterly business cycle series are included in table 2 of this report. Rates of change are helpful in judging and appraising trends of acceleration or retardation in a current business cycle phase, despite the fact that the erratic nature of month-to-month rates of change often makes it difficult to determine the significance of a change until some months after it has occurred. For series, such as unemployment and layoffs, which usually move down during expansions and up during recessions, the changes are inverted so that, in table 2, rises are shown as declines and declines as rises.

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This report includes 29 diffusion indexes. Seventeen of these indexes utilize 300 components of 9 principal indicators. For 8 of these indicators, the components are compared over 3-month as well as 1-month spans, while for 1 of them, comparisons are made over 1-month spans only. The 12 other diffusion indexes are based on 7 series which are closely related to the principal indicators. They include the Chicago Purchasing Agents Association index based on monthly reports of changes in profits (200 companies), the First National City Bank of New York index based on quarterly profit reports (600 companies), and 10 NBER diffusion indexes, as follows: Manufacturers' actual and anticipated sales (800 companies) and actual and anticipated

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Diffusion indexes constructed on the basis of current data are often highly irregular and require careful judgment in their use and interpretation.

Series numbers preceded by the letter "D" designate diffusion indexes. When one of these numbers corresponds to a basic indicator series number, it means that the diffusion index has been computed from components of the indicator series; for example, the diffusion index numbered "D6" is computed from components of series number 6. Diffusion indexes not computed from basic series components are assigned new numbers.

**Timing distributions.**—Distributions of current "highs" and "lows" appear to be helpful in identifying a turning point in the business cycle promptly after it occurs. Each month a timing distribution is constructed which shows the number of series reaching high (low) values during each of the recent expansion (contraction) months. The timing distribution is summarized by showing the number of series reaching new highs (lows) and the percent currently high (low) for each of several recent months (see table 3).

To compile timing distributions, the data for each of the 50 business cycle indicators over the period of the current cyclical phase are scanned each month. During a business cycle contraction, the low value for each series is identified; during an expansion, the high value is identified. For inverted series, that is, series with negative conformity to the business cycle, high values are taken during contraction and low values during expansion. If the values for 2 or more months are equal, the latest date is taken as the low (high) month. In selecting these values, erratic values are disregarded, although it is, of course, difficult to identify an erratic value, particularly for the current month.

The letter "L" is used in the basic data table (table 1) to identify and highlight the current low values during contraction and the letter "H", to identify current high values during expansion. In addition, these symbols are used to identify the low values preceding current highs and high values preceding current lows. These identifications facilitate an economic interpretation of the timing distribution since they show the months in which economic activities reached their lows or highs.

Interpretations of timing distributions must be made in light of the fact that a contraction following a high value reached several months ago may be the result of an erratic fluctuation and that a new high may be reached in some future month. In short, when the percent currently high falls below

50 percent for both the leading and roughly coincident series, this does not necessarily signify that a business cycle peak has occurred. It may do so, but it may also simply reflect a short reversal in the upward movement.

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Contractions are compared by computing changes over the span from the most recent business cycle peak to the current month and over equal spans from previous reference peaks. This type of comparison is designated as representing changes from reference peak levels and from reference peak dates.

Expansions may be compared by measuring changes from the immediately preceding peak levels. In this report the current expansion is related to the May 1960 reference peak. For earlier expansions, percentage changes are also computed from their respective reference peaks to dates which are the same number of months beyond the succeeding reference troughs as the current expansion is beyond its reference trough. This type of comparison is designated as representing changes computed from reference peak levels and from reference trough dates. Although the spans from reference trough dates are the same for each expansion, the spans from the preceding peak dates are different, depending on the length of the contractions. This type of comparison answers the question whether, and by how much, the current level of activity exceeds or falls short of the level at the preceding business cycle peak, a given number of months after the recovery began, and how the current situation compares in this respect with earlier recoveries.

Expansions also may be compared by computing changes from reference trough levels and from reference trough dates. This type of comparison measures the extent of the rise from the trough level so many months after the upswing began.

In addition to comparing cyclical fluctuations on the basis of reference dates (which are the same for all series), comparisons are made on the basis of specific peak and trough dates identified for each

## Descriptions and Procedures

series. For example, the specific peak in retail sales corresponding to the May 1960 reference peak is April 1960; the specific peak in stock prices is July 1959.

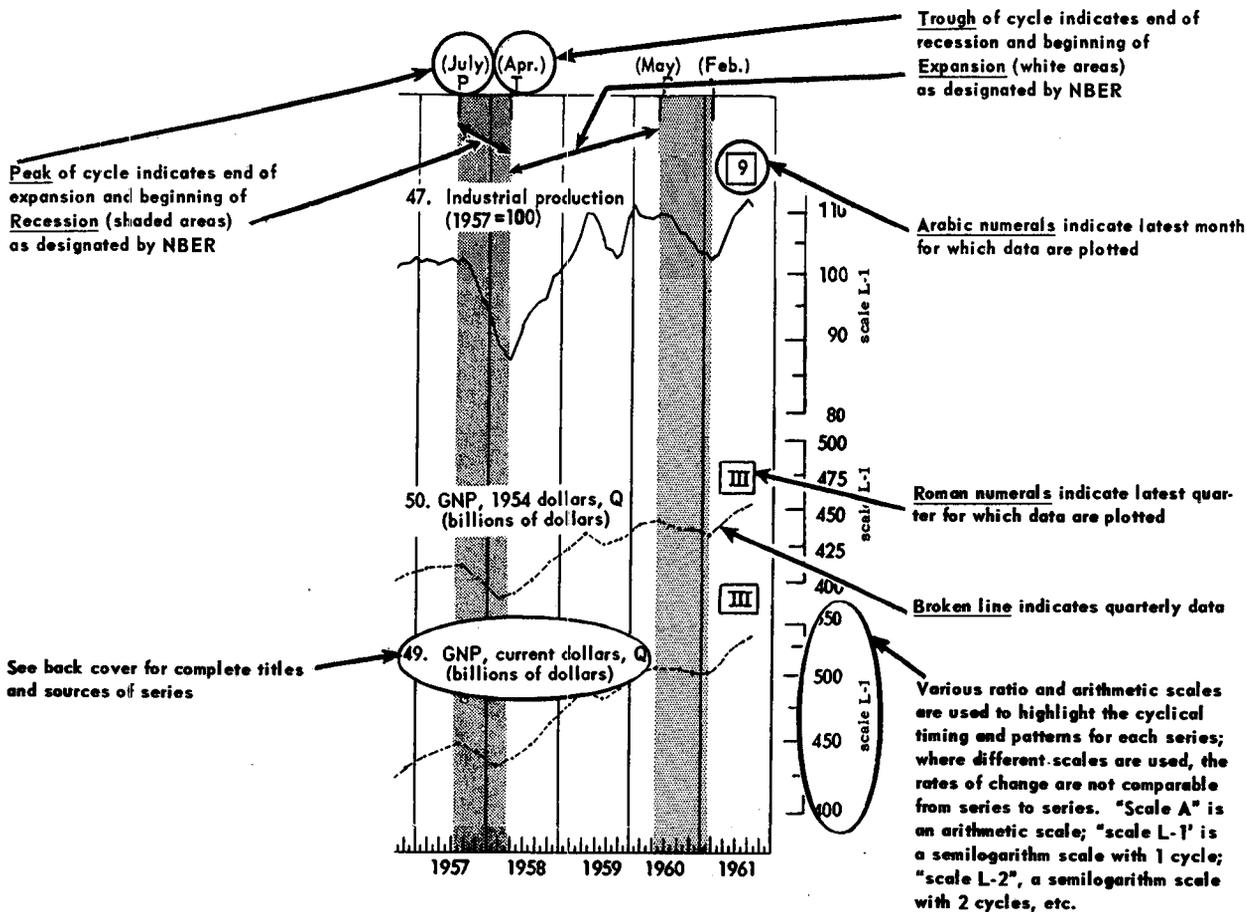
Recent performance in several individual indicators is compared graphically with that in earlier business cycles. In making graphic comparisons, the reference peak or trough levels are set equal to 100, and the reference peak or trough dates are aligned depending on the phase of the business cycle.

In order to make historical comparisons, it is frequently necessary to use data for a closely related series for cycles prior to the initial date covered by the series used currently. Such comparisons are, therefore, to be considered only approximate. Nearly all series have undergone change in

definition, coverage, or estimation procedure since 1919. The principal cases of this sort are as follows:

7. New private permanent nonfarm dwelling units started (prior to 1939: Residential building contracts, floor space)
41. Number of employees in nonagricultural establishments (prior to 1929: Employment in manufacturing)
52. Personal income (prior to 1929: Quarterly data as published by Barger and Klein)
54. Sales of retail stores (prior to 1935: Department store sales)
62. Index of wage and salary cost per unit of output, total manufacturing (prior to 1946: Production worker wage cost per unit. Supplements to wages and salaries, which are a part of total labor cost, are not included).

### HOW TO READ THE TIME SERIES CHARTS (CHARTS 1-3)



### IMPORTANT FEATURES AND CHANGES FOR THIS ISSUE

A limited number of changes are made from time to time to reflect the change from one stage of the business cycle to another, to show new findings of business cycle research and newly available economic series, or to emphasize the activity of a particular series or series group. Such changes may involve additions or deletions of series used, changes in placement in relation to other series, changes in components of indexes, etc. These changes will be listed in this section each month. The changes made in this issue are as follows:

1. Eighteen series have been revised using the new seasonal adjustment factors shown in appendix table D. These factors result from two new versions (X-9 and X-10) of the Census Method II seasonal adjustment program (see appendix, page 62). The table below shows each series (by series number) that is revised, the program used, and the period of the revision.

Series number	Seasonal adjustment program used	Data revised back to--	Series number	Seasonal adjustment program used	Data revised back to--
4.....	X-9	June 1959	45.....	X-9	Jan. 1960
5.....	X-9	Jan. 1948	82.....	X-9	Jan. 1960
9.....	X-9	Jan. 1960	83.....	X-9	Jan. 1960
13.....	X-9	Jan. 1959	84.....	X-9	Jan. 1960
14.....	X-10	Jan. 1960	90.....	X-10	July 1953
15.....	X-10	Jan. 1961	91.....	X-10	July 1953
18 (Q)..	X-9	1stQ 1959	92.....	X-10	Jan. 1951
25.....	X-9	Feb. 1959	125.....	X-10	Jan. 1948
30.....	X-9	Jan. 1962	128.....	X-9	Jan. 1948

2. Diffusion indexes D1 and D41 on average workweek and number of employees have been revised to take account of revisions introduced in November 1961. Revisions are reflected in chart 2, table 4, table 6A, and table 6F. Index D41 now shows 30 components instead of 32 ("communications" and "other public utilities" have been combined with "transportation").

3. Diffusion index D11a, capital appropriations for 602 companies has been revised by the National Industrial Conference Board back to the 4th quarter 1958.

4. Series 42, 43, and 44, on employment and unemployment have been revised by the Bureau of Labor Statistics back to January 1948.

5. Series 86, 87, and 88, on foreign trade, have been revised back to January 1960.

6. Series 51 on bank debits has been revised back to January 1959.

7. Series 43 on unemployment rate has been added to table 8.

### NOTICE TO SUBSCRIBERS

**Airmail delivery.**—To answer requests for prompt receipt of this report, airmail delivery in the United States has been arranged at an additional charge of \$5.25 per year. All correspondence about this service should be addressed to the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C.

**Background materials.**—Experimental work for this report was carried out in collaboration with the NBER which is responsible for much of the early research in this field. The paper, "Signals of Recession and Recovery," contains an explanation of research findings helpful in interpreting current cyclical trends, a more detailed description of the indicators and measures used, and additional historical data. This paper was issued as Occasional Paper 77 of the National Bureau of Economic Research, 261 Madison Avenue, New York 16, N.Y. (207 pages, price \$3).

# Business Cycle Developments

## INTRODUCTION

This report has been prepared to bring together many of the available economic indicators in convenient form for analysis and interpretation by specialists in business cycle analysis. The presentation and classification of series in this report follows the business indicators approach. The classification of series and the business cycle turning dates are those designated by the National Bureau of Economic Research (NBER) which, in recent years, has been the leader in this field of investigation. However, this publication is not to be taken as implying acceptance or endorsement by the Bureau of the Census or any other government agency of any particular approach to business cycle analysis. It is intended only to supplement other reports of the Department of Commerce that provide data for analyzing current business conditions.

The unique features are the arrangement of data according to their usual timing relations during the course of the business cycle and the inclusion of special analytical measures and historical cyclical comparisons that help in evaluating the current stage of the business cycle.

The chief merits of this report are the speed with which the data for indicators are collected, assembled, and published and the arrangement of the series for business cycle studies. Electronic computers are used for many of the computations, thus making early publication possible. Publication is scheduled for about the 20th of the month following the month of data.

About 70 principal indicators and over 300 components are used for the different measures shown. The movements of the series are shown against the background of the expansions and contractions of the general business cycle so that "leads" and "lags" can be readily detected and unusual cyclical developments spotted. The exact number of series included for the total and important classes of series may vary from month to month because of additions of new series and revisions in the composition of indexes. Almost all of the basic data are available in published reports. A complete list of the series and the sources of data is shown on the back cover of this report. All the data shown are seasonally adjusted where seasonal variations appear to exist.

## ORGANIZATION AND CONTENT OF THE REPORT

Three types of data are shown in this report. They are as follows:

**Basic data** (chart 1 and table 1).—Over 50 business cycle indicators and 20 additional series with business cycle significance are included. Together they provide a broad view of current and prospective business cycle fluctuations in the economy as well as the basis for making an economic interpretation of these fluctuations.

**Analytical measures** (charts 2-3 and tables 2-6).—These are measures which aid in forming a judgment of (1) the magnitude of current changes compared to previous changes, (2) the imminence of a turning point in the business cycle, and (3) the extent of current changes in different parts of the economy. They also aid in pointing to developments in particular industries and places.

**Cyclical patterns** (charts 4-5 and tables 7-8).—The current cyclical change is compared with changes at corresponding stages of earlier cycles. These comparisons are made in different ways depending upon the phase of the business cycle.

In addition to the data shown as part of the regular report, certain appendix materials are presented. These materials include historical data, key information, and adjustment factors.

## DESCRIPTIONS AND PROCEDURES

### Business Cycle Series

The three major groups of series are those with a fairly consistent timing relation to the business cycle. They are grouped, in accordance with the NBER classification, as "leading," "roughly coincident," or "lagging" indicators. Additional series are also included for a more complete coverage of the national economy. The series are described as follows:

**NBER Leading Indicators**.—Around 30 series usually reach peaks or troughs before those in aggregate economic activity as measured by the roughly coincident series (see below). For this reason, they are designated as "leading" series. One group of these series pertains to activities in the labor market, another to orders and contracts, and so on.

**NBER Roughly Coincident Indicators**.—About 15 series are direct measures of aggregate economic activity or move roughly together with it; for example, nonagricultural employment, industrial production or retail sales. For this reason they are referred to as "roughly coincident" series.

**NBER Lagging Indicators**.—Some series, such as new plant and equipment expenditures and manufacturers' inventories, usually have reached turning points after they were reached in aggregate economic activity, and for this reason, they are designated as "lagging" series.

**Other series**.—About 20 additional U.S. series with business cycle significance are also shown. Some of these series, such as change in money supply, merchandise trade balance, and cash surplus or deficit, represent important factors in the economy, but they have not qualified as indicators for various reasons, such as irregularity in timing. Finally, industrial production indexes for several countries which have important trade relations with the United States are presented.

**Seasonal Adjustments**

Official seasonally adjusted data are used in this report wherever they are available. However, for the special purposes of business cycle studies, a number of series that are not ordinarily published in seasonally adjusted form are shown on a seasonally adjusted basis in this report. These series are as follows:

4. Number of persons on temporary layoff, all industries
5. Initial claims for unemployment insurance, State programs
9. Construction contracts awarded for commercial and industrial buildings, floor space
13. Number of new business incorporations
14. Current liabilities of business failures
15. Number of business failures with liabilities of \$100,000 and over
18. Profits (before taxes) per dollar of sales, all manufacturing corporations
25. Change in manufacturers' unfilled orders, durable goods industries
30. Nonagricultural placements, all industries
45. Average weekly insured unemployment, State programs
55. Index of wholesale prices, all commodities other than farm products and foods
66. Consumer installment debt, end of month
81. Index of consumer prices
82. Federal cash payments to the public
83. Federal cash receipts from the public
84. Federal cash surplus or deficit
90. Defense Department obligations, procurement
91. Defense Department obligations, total
92. Military prime contract awards to U.S. business firms
125. West Germany, index of industrial production
128. Japan, index of industrial production

Seasonal adjustments for these series were developed by either the Bureau of the Census or the NBER. The adjustment factors used are shown in the appendix, table D. Seasonally adjusted data prepared by the collecting agency will be substituted for the series mentioned above whenever they are published.

**Designation of Business Cycle Turning Points**

The historical business cycle turning points are those designated by the NBER. They mark the approximate date when aggregate economic activity reached its cyclical high or low levels. As a matter of general practice, a business cycle turning point will not be designated until at least 6 months after it has occurred.

**Charts**

Time series line charts (charts 1-3) are used to show the cyclical timing and pattern of each series. Since various ratio and arithmetic scales are used, rates of change are not comparable except for those series having the same scale. See the diagram, page 4, for additional help in using the charts.

Shaded areas on the charts indicate periods of business cycle contraction between reference dates for peaks ("P"—beginnings of shaded areas) and

troughs ("T"—ends of shaded areas). The shading for a recession period will be entered only after a trough has been designated.

**Analytical Measures of Current Change**

Four kinds of analytical measures are presented—rates of change, diffusion indexes, timing distributions, and direction-of-change tables. These measures aid in forming a judgment of the magnitude of current changes compared to previous changes, the imminence of a turning point in the business cycle, and the extent of current changes in different parts of the economy. They also point to developments in particular industries and places.

**Rates of change.**—There is considerable interest in the rate of acceleration during expansions and the rate of retardation during recessions. For this reason, rates of change for the principal monthly and quarterly business cycle series are included in table 2 of this report. Rates of change are helpful in judging and appraising trends of acceleration or retardation in a current business cycle phase, despite the fact that the erratic nature of month-to-month rates of change often makes it difficult to determine the significance of a change until some months after it has occurred. For series, such as unemployment and layoffs, which usually move down during expansions and up during recessions, the changes are inverted so that, in table 2, rises are shown as declines and declines as rises.

**Diffusion indexes.**—Diffusion indexes are simple summary measures of groups of economic series. They express, for a given group, the percent of the series which has risen over given intervals of time. Their turning points tend to lead the turning points of the aggregate and they measure how widespread a business change is. They vary between the limits of 100 (all components rising) and zero (all components falling). Widespread increases are often associated with rapid growth in aggregate activity, and widespread declines with sharp reductions.

The diffusion indexes in this report are grouped according to the timing classification of the NBER. For monthly series, two comparison intervals are used: 1-month intervals (January-February, February-March, etc.) and 3-month intervals (January-April, February-May, etc.). The indexes based on 1-month intervals are more "current" but they are also more irregular than the 3-month indexes (see chart 2). Quarterly series are compared over 1-quarter intervals and 4-quarter intervals.

This report includes 29 diffusion indexes. Seventeen of these indexes utilize 300 components of 9 principal indicators. For 8 of these indicators, the components are compared over 3-month as well as 1-month spans, while for 1 of them, comparisons are made over 1-month spans only. The 12 other diffusion indexes are based on 7 series which are closely related to the principal indicators. They include the Chicago Purchasing Agents Association index based on monthly reports of changes in profits (200 companies), the First National City Bank of New York index based on quarterly profit reports (600 companies), and 10 NBER diffusion indexes, as follows: Manufacturers' actual and anticipated sales (800 companies) and actual and anticipated

new orders (400 companies), based on data from Dun and Bradstreet, Inc.; actual and anticipated carloadings (19 commodity groups), based on data from the Association of American Railroads; actual and anticipated new plant and equipment expenditures (16 industries), based on data from Office of Business Economics and the Securities and Exchange Commission; and actual indexes of capital appropriations for 602 companies and for 15 industries, based on data from the National Industrial Conference Board.

Diffusion indexes constructed on the basis of current data are often highly irregular and require careful judgment in their use and interpretation.

Series numbers preceded by the letter "D" designate diffusion indexes. When one of these numbers corresponds to a basic indicator series number, it means that the diffusion index has been computed from components of the indicator series; for example, the diffusion index numbered "D6" is computed from components of series number 6. Diffusion indexes not computed from basic series components are assigned new numbers.

**Timing distributions.**—Distributions of current "highs" and "lows" appear to be helpful in identifying a turning point in the business cycle promptly after it occurs. Each month a timing distribution is constructed which shows the number of series reaching high (low) values during each of the recent expansion (contraction) months. The timing distribution is summarized by showing the number of series reaching new highs (lows) and the percent currently high (low) for each of several recent months (see table 3).

To compile timing distributions, the data for each of the 50 business cycle indicators over the period of the current cyclical phase are scanned each month. During a business cycle contraction, the low value for each series is identified; during an expansion, the high value is identified. For inverted series, that is, series with negative conformity to the business cycle, high values are taken during contraction and low values during expansion. If the values for 2 or more months are equal, the latest date is taken as the low (high) month. In selecting these values, erratic values are disregarded, although it is, of course, difficult to identify an erratic value, particularly for the current month.

The letter "L" is used in the basic data table (table 1) to identify and highlight the current low values during contraction and the letter "H", to identify current high values during expansion. In addition, these symbols are used to identify the low values preceding current highs and high values preceding current lows. These identifications facilitate an economic interpretation of the timing distribution since they show the months in which economic activities reached their lows or highs.

Interpretations of timing distributions must be made in light of the fact that a contraction following a high value reached several months ago may be the result of an erratic fluctuation and that a new high may be reached in some future month. In short, when the percent currently high falls below

50 percent for both the leading and roughly coincident series, this does not necessarily signify that a business cycle peak has occurred. It may do so, but it may also simply reflect a short reversal in the upward movement.

**Direction-of-change tables.**—Direction-of-change tables show directions of change ("+" for rising, "o" for unchanged, and "-" for falling) in the components used for the diffusion indexes. These tables provide a convenient view of changing business conditions and are helpful in making an economic interpretation of the movements in the more highly aggregated statistical measures. That is, they show which economic activities went up, which went down, and how long such movements have persisted. They also help to show how a recession or recovery spreads from one sector of the economy to another.

### Comparisons of Cyclical Patterns

In forming a judgment about the current intensity and probable ultimate character of a cyclical fluctuation, some economists find it helpful to compare the behavior of the indicator series and diffusion indexes in the current business cycle phase with their behavior during the corresponding phase of previous business cycles. These comparisons are made in different ways depending upon the phase of the business cycle.

Contractions are compared by computing changes over the span from the most recent business cycle peak to the current month and over equal spans from previous reference peaks. This type of comparison is designated as representing changes from reference peak levels and from reference peak dates.

Expansions may be compared by measuring changes from the immediately preceding peak levels. In this report the current expansion is related to the May 1960 reference peak. For earlier expansions, percentage changes are also computed from their respective reference peaks to dates which are the same number of months beyond the succeeding reference troughs as the current expansion is beyond its reference trough. This type of comparison is designated as representing changes computed from reference peak levels and from reference trough dates. Although the spans from reference trough dates are the same for each expansion, the spans from the preceding peak dates are different, depending on the length of the contractions. This type of comparison answers the question whether, and by how much, the current level of activity exceeds or falls short of the level at the preceding business cycle peak, a given number of months after the recovery began, and how the current situation compares in this respect with earlier recoveries.

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## Descriptions and Procedures

series. For example, the specific peak in retail sales corresponding to the May 1960 reference peak is April 1960; the specific peak in stock prices is July 1959.

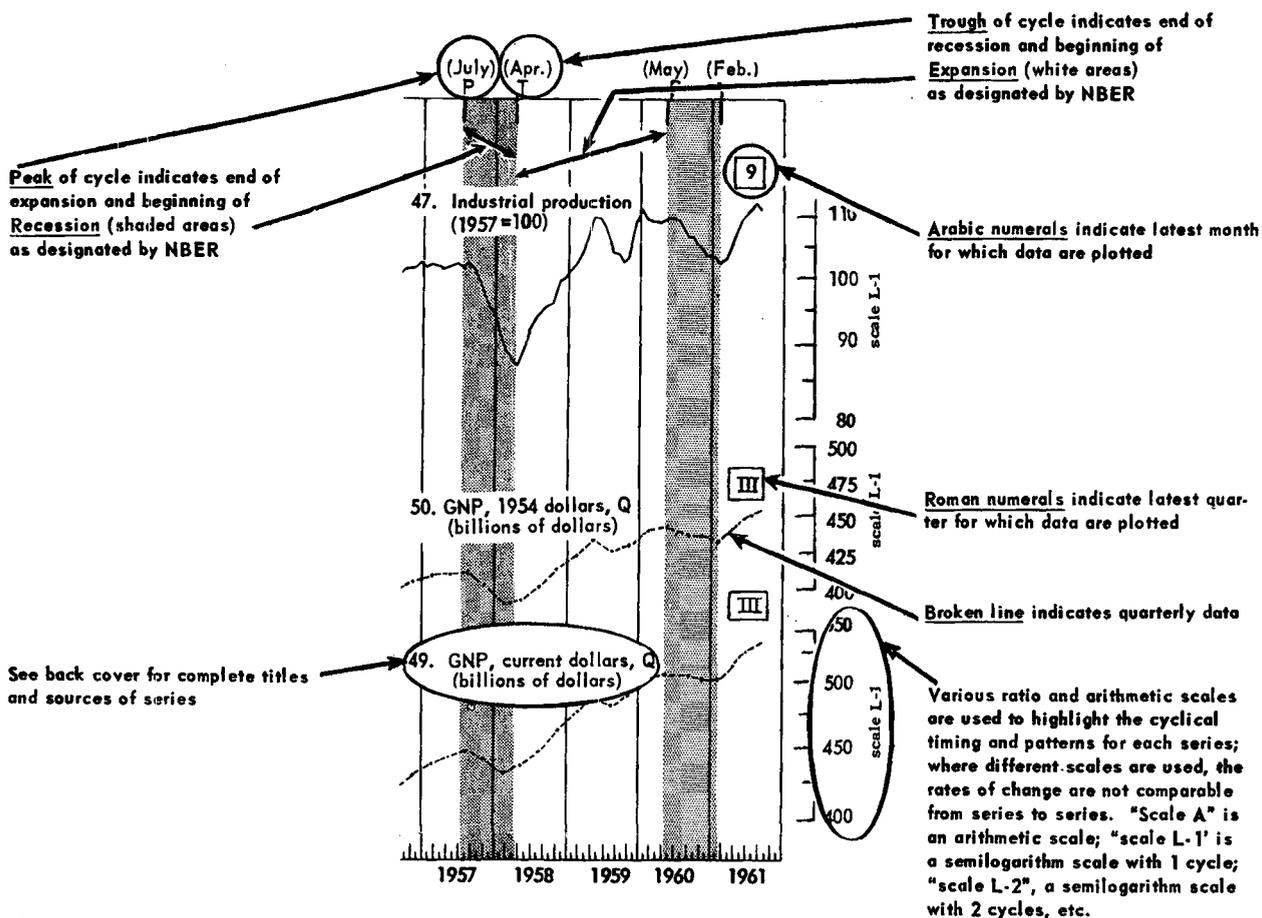
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In order to make historical comparisons, it is frequently necessary to use data for a closely related series for cycles prior to the initial date covered by the series used currently. Such comparisons are, therefore, to be considered only approximate. Nearly all series have undergone change in

definition, coverage, or estimation procedure since 1919. The principal cases of this sort are as follows:

7. New private permanent nonfarm dwelling units started (prior to 1939: Residential building contracts, floor space)
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52. Personal income (prior to 1929: Quarterly data as published by Barger and Klein)
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### HOW TO READ THE TIME SERIES CHARTS (CHARTS 1-3)



# Business Cycle Developments

## INTRODUCTION

This report has been prepared to bring together many of the available economic indicators in convenient form for analysis and interpretation by specialists in business cycle analysis. The presentation and classification of series in this report follows the business indicators approach. The classification of series and the business cycle turning dates are those designated by the National Bureau of Economic Research (NBER) which, in recent years, has been the leader in this field of investigation. However, this publication is not to be taken as implying acceptance or endorsement by the Bureau of the Census or any other government agency of any particular approach to business cycle analysis. It is intended only to supplement other reports of the Department of Commerce that provide data for analyzing current business conditions.

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The chief merits of this report are the speed with which the data for indicators are collected, assembled, and published and the arrangement of the series for business cycle studies. Electronic computers are used for many of the computations, thus making early publication possible. Publication is scheduled for about the 20th of the month following the month of data.

About 70 principal indicators and over 300 components are used for the different measures shown. The movements of the series are shown against the background of the expansions and contractions of the general business cycle so that "leads" and "lags" can be readily detected and unusual cyclical developments spotted. The exact number of series included for the total and important classes of series may vary from month to month because of additions of new series and revisions in the composition of indexes. Almost all of the basic data are available in published reports. A complete list of the series and the sources of data is shown on the back cover of this report. All the data shown are seasonally adjusted where seasonal variations appear to exist.

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Three types of data are shown in this report. They are as follows:

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Analytical measures (charts 2-3 and tables 2-6).—These are measures which aid in forming a judgment of (1) the magnitude of current changes compared to previous changes, (2) the imminence of a turning point in the business cycle, and (3) the extent of current changes in different parts of the economy. They also aid in pointing to developments in particular industries and places.

Cyclical patterns (charts 4-5 and tables 7-8).—The current cyclical change is compared with changes at corresponding stages of earlier cycles. These comparisons are made in different ways depending upon the phase of the business cycle.

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The three major groups of series are those with a fairly consistent timing relation to the business cycle. They are grouped, in accordance with the NBER classification, as "leading," "roughly coincident," or "lagging" indicators. Additional series are also included for a more complete coverage of the national economy. The series are described as follows:

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NBER Roughly Coincident Indicators.—About 15 series are direct measures of aggregate economic activity or move roughly together with it; for example, nonagricultural employment, industrial production or retail sales. For this reason they are referred to as "roughly coincident" series.

NBER Lagging Indicators.—Some series, such as new plant and equipment expenditures and manufacturers' inventories, usually have reached turning points after they were reached in aggregate economic activity, and for this reason, they are designated as "lagging" series.

Other series.—About 20 additional U.S. series with business cycle significance are also shown. Some of these series, such as change in money supply, merchandise trade balance, and cash surplus or deficit, represent important factors in the economy, but they have not qualified as indicators for various reasons, such as irregularity in timing. Finally, industrial production indexes for several countries which have important trade relations with the United States are presented.

**Seasonal Adjustments**

Official seasonally adjusted data are used in this report wherever they are available. However, for the special purposes of business cycle studies, a number of series that are not ordinarily published in seasonally adjusted form are shown on a seasonally adjusted basis in this report. These series are as follows:

4. Number of persons on temporary layoff, all industries
5. Initial claims for unemployment insurance, State programs
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13. Number of new business incorporations
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15. Number of business failures with liabilities of \$100,000 and over
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25. Change in manufacturers' unfilled orders, durable goods industries
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81. Index of consumer prices
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83. Federal cash receipts from the public
84. Federal cash surplus or deficit
90. Defense Department obligations, procurement
91. Defense Department obligations, total
92. Military prime contract awards to U.S. business firms
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128. Japan, index of industrial production

Seasonal adjustments for these series were developed by either the Bureau of the Census or the NBER. The adjustment factors used are shown in the appendix, table D. These factors result from two new versions (X-9 and X-10) of the Census Method II seasonal adjustment program (see appendix, page 62). Seasonally adjusted data prepared by the collecting agency will be substituted for the series mentioned above whenever they are published.

**Designation of Business Cycle Turning Points**

The historical business cycle turning points are those designated by the NBER. They mark the approximate date when aggregate economic activity reached its cyclical high or low levels. As a matter of general practice, a business cycle turning point will not be designated until at least 6 months after it has occurred.

**Charts**

Time series line charts (charts 1-3) are used to show the cyclical timing and pattern of each series. Since various ratio and arithmetic scales are used, rates of change are not comparable except for those series having the same scale. See the diagram, page 4, for additional help in using the charts.

Shaded areas on the charts indicate periods of business cycle contraction between reference dates

for peaks ("P"—beginnings of shaded areas) and troughs ("T"—ends of shaded areas). The shading for a recession period will be entered only after a trough has been designated.

**Analytical Measures of Current Change**

Four kinds of analytical measures are presented—rates of change, diffusion indexes, timing distributions, and direction-of-change tables. These measures aid in forming a judgment of the magnitude of current changes compared to previous changes, the imminence of a turning point in the business cycle, and the extent of current changes in different parts of the economy. They also point to developments in particular industries and places.

**Rates of change.**—There is considerable interest in the rate of acceleration during expansions and the rate of retardation during recessions. For this reason, rates of change for the principal monthly and quarterly business cycle series are included in table 2 of this report. Rates of change are helpful in judging and appraising trends of acceleration or retardation in a current business cycle phase, despite the fact that the erratic nature of month-to-month rates of change often makes it difficult to determine the significance of a change until some months after it has occurred. For series, such as unemployment and layoffs, which usually move down during expansions and up during recessions, the changes are inverted so that, in table 2, rises are shown as declines and declines as rises.

**Diffusion indexes.**—Diffusion indexes are simple summary measures of groups of economic series. They express, for a given group, the percent of the series which has risen over given intervals of time. Their turning points tend to lead the turning points of the aggregate and they measure how widespread a business change is. They vary between the limits of 100 (all components rising) and zero (all components falling). Widespread increases are often associated with rapid growth in aggregate activity, and widespread declines with sharp reductions.

The diffusion indexes in this report are grouped according to the timing classification of the NBER. For monthly series, two comparison intervals are used: 1-month intervals (January-February, February-March, etc.) and 3-month intervals (January-April, February-May, etc.). The indexes based on 1-month intervals are more "current" but they are also more irregular than the 3-month indexes (see chart 2). Quarterly series are compared over 1-quarter intervals and 4-quarter intervals.

Series numbers preceded by the letter "D" designate diffusion indexes. When one of these numbers corresponds to a basic indicator series number, it means that the diffusion index has been computed from components of the indicator series; for example, the diffusion index numbered "D6" is computed from components of series number 6. Diffusion indexes not computed from basic series components are assigned new numbers.

This report includes 29 diffusion indexes based on 16 indicator series (see tables 4 and 5). Seventeen of these indexes are computed by the Bureau of the Census utilizing nearly 300 components of 9 indicators (D1, D5, D6, D19, D23, D41, D47, D54,

and D58). Indexes for 8 of these indicators show comparisons for components over both 3-month and 1-month spans while, for 1 indicator (D58), comparisons are over 1-month spans only. The 12 other diffusion indexes are based on 7 indicators closely related to the above 9 indicators. They include two indexes on capital appropriations (602 companies and 15 industries)—NBER indexes based on data from the National Industrial Conference Board; the Chicago Purchasing Agents Association index based on monthly reports of changes in profits (200 companies); the First National City Bank of New York index based on quarterly profit reports (600 companies); and 8 NBER diffusion indexes—actual and anticipated—for the following: Manufacturers' sales (800 companies) and new orders (400 companies), based on data from Dun and Bradstreet, Inc.; carloadings (19 commodity groups), based on data from the Association of American Railroads; and new plant and equipment expenditures (16 industries), based on data from the Office of Business Economics and the Securities and Exchange Commission.

Diffusion indexes that are based on anticipations show what proportion of business enterprises (or industries) are forecasting a rise in activity. Comparisons with indexes based on actual changes show whether there is a generally optimistic bias or a lag in recognition of actual developments.

Diffusion indexes constructed on the basis of current data are often highly irregular and require careful judgment in their use and interpretation.

Timing distributions.—Distributions of current "highs" and "lows" appear to be helpful in identifying a turning point in the business cycle promptly after it occurs. Each month a timing distribution is constructed which shows the number of series reaching high (low) values during each of the recent expansion (contraction) months. The timing distribution is summarized by showing the number of series reaching new highs (lows) and the percent currently high (low) for each of several recent months (see table 3).

To compile timing distributions, the data for each of the 50 business cycle indicators over the period of the current cyclical phase are scanned each month. During a business cycle contraction, the low value for each series is identified; during an expansion, the high value is identified. For inverted series, that is, series with negative conformity to the business cycle, high values are taken during contraction and low values during expansion. If the values for 2 or more months are equal, the latest date is taken as the low (high) month. In selecting these values, erratic values are disregarded, although it is, of course, difficult to identify an erratic value, particularly for the current month.

The letter "L" is used in the basic data table (table 1) to identify and highlight the current low values during contraction and the letter "H", to identify current high values during expansion. In addition, these symbols are used to identify the low values preceding current highs and high values preceding current lows. These identifications facilitate an economic interpretation of the timing

distribution since they show the months in which economic activities reached their lows or highs.

Interpretations of timing distributions must be made in light of the fact that a contraction following a high value reached several months ago may be the result of an erratic fluctuation and that a new high may be reached in some future month. In short, when the percent currently high falls below 50 percent for both the leading and roughly coincident series, this does not necessarily signify that a business cycle peak has occurred. It may do so, but it may also simply reflect a short reversal in the upward movement.

Direction-of-change tables.—Direction-of-change tables show directions of change ("+" for rising, "o" for unchanged, and "-" for falling) in the components used for the diffusion indexes. These tables provide a convenient view of changing business conditions and are helpful in making an economic interpretation of the movements in the more highly aggregated statistical measures. That is, they show which economic activities went up, which went down, and how long such movements have persisted. They also help to show how a recession or recovery spreads from one sector of the economy to another.

### Comparisons of Cyclical Patterns

In forming a judgment about the current intensity and probable ultimate character of a cyclical fluctuation, some economists find it helpful to compare the behavior of the indicator series and diffusion indexes in the current business cycle phase with their behavior during the corresponding phase of previous business cycles. These comparisons are made in different ways depending upon the phase of the business cycle.

Contractions are compared by computing changes over the span from the most recent business cycle peak to the current month and over equal spans from previous reference peaks. This type of comparison is designated as representing changes from reference peak levels and from reference peak dates.

Expansions may be compared by measuring changes from the immediately preceding peak levels. In this report the current expansion is related to the May 1960 reference peak. For earlier expansions, percentage changes are also computed from their respective reference peaks to dates which are the same number of months beyond the succeeding reference troughs as the current expansion is beyond its reference trough. This type of comparison is designated as representing changes computed from reference peak levels and from reference trough dates. Although the spans from reference trough dates are the same for each expansion, the spans from the preceding peak dates are different, depending on the length of the contractions. This type of comparison answers the question whether, and by how much, the current level of activity exceeds or falls short of the level at the preceding business cycle peak, a given number of months after the recovery began, and how the current situation compares in this respect with earlier recoveries.

## Descriptions and Procedures

Expansions also may be compared by computing changes from reference trough levels and from reference trough dates. This type of comparison measures the extent of the rise from the trough level so many months after the upswing began.

In addition to comparing cyclical fluctuations on the basis of reference dates (which are the same for all series), comparisons are made on the basis of specific peak and trough dates identified for each series. For example, the specific peak in retail sales corresponding to the May 1960 reference peak is April 1960; the specific peak in stock prices is July 1959.

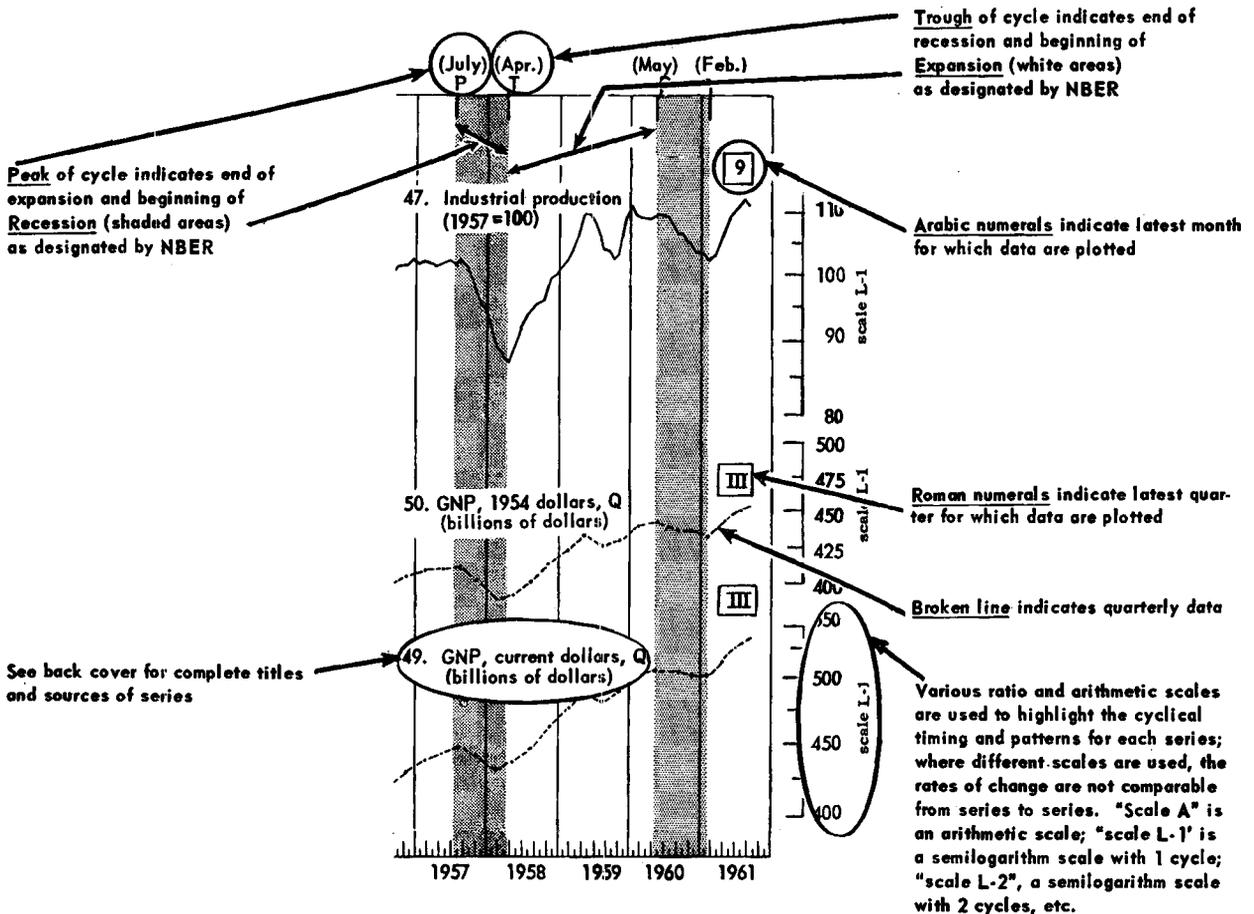
Recent performance in several individual indicators is compared graphically with that in earlier business cycles. In making graphic comparisons, the reference peak or trough levels are set equal to 100, and the reference peak or trough dates are aligned depending on the phase of the business cycle.

In order to make historical comparisons, it is frequently necessary to use data for a closely

related series for cycles prior to the initial date covered by the series used currently. Such comparisons are, therefore, to be considered only approximate. Nearly all series have undergone change in definition, coverage, or estimation procedure since 1919. The principal cases of this sort are as follows:

7. New private permanent nonfarm dwelling units started (prior to 1939: Residential building contracts, floor space)
41. Number of employees in nonagricultural establishments (prior to 1929: Employment in manufacturing)
52. Personal income (prior to 1929: Quarterly data as published by Barger and Klein)
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62. Index of wage and salary cost per unit of output, total manufacturing (prior to 1946: Production worker wage cost per unit. Supplements to wages and salaries, which are a part of total labor cost, are not included).

### HOW TO READ THE TIME SERIES CHARTS (CHARTS 1-3)



### IMPORTANT FEATURES AND CHANGES FOR THIS ISSUE

A limited number of changes are made from time to time to reflect the change from one stage of the business cycle to another, to show new findings of business cycle research and newly available economic series, or to emphasize the activity of a particular series or series group. Such changes may involve additions or deletions of series used, changes in placement in relation to other series, changes in components of indexes, etc. These changes will be listed in this section each month. The changes made in this issue are as follows:

1. A new table (see table 4) showing historical timing distributions has been added as an aid to interpretation of distributions shown, in table 3, for the current expansion.
2. A new table (see table 9) showing percent changes from reference trough dates has been added to provide data similar to that showing changes from specific dates in table 10.
3. A page has been added to chart 4 showing comparisons of reference cycle patterns for four lagging indicators.
4. A new series on unemployment rate of married males (series 40) has been added to the report. This series replaces the series on number of unemployed persons 14 years old and over (series 44).
5. The series on average weekly insured unemployment (series 45) has been converted to a rate (percent of covered employment).
6. The series on wholesale prices, except farm products and foods (series 55) has been revised back to January 1948 because of a new seasonal adjustment made by the X-9 program.
7. Revisions, back to January 1960, are shown for contracts and orders for plant and equipment (series 10) and price per unit of labor cost index (series 17). The revisions reflect new seasonal adjustments for components.

### BACKGROUND MATERIALS

Experimental work for this report was carried out in collaboration with the NBER which is responsible for much of the early research in this field. The paper, "Signals of Recession and Recovery," contains an explanation of research findings helpful in interpreting current cyclical trends, a more detailed description of the indicators and measures used, and additional historical data. This paper was issued as Occasional Paper 77 of the National Bureau of Economic Research, 261 Madison Avenue, New York 16, N.Y. (207 pages, price \$3).

# Business Cycle Developments

## INTRODUCTION

This report has been prepared to bring together many of the available economic indicators in convenient form for analysis and interpretation by specialists in business cycle analysis. The presentation and classification of series in this report follows the business indicators approach. The classification of series and the business cycle turning dates are those designated by the National Bureau of Economic Research (NBER) which, in recent years, has been the leader in this field of investigation. However, this publication is not to be taken as implying acceptance or endorsement by the Bureau of the Census or any other government agency of any particular approach to business cycle analysis. It is intended only to supplement other reports of the Department of Commerce that provide data for analyzing current business conditions.

The unique features are the arrangement of data according to their usual timing relations during the course of the business cycle and the inclusion of special analytical measures and historical cyclical comparisons that help in evaluating the current stage of the business cycle.

The chief merits of this report are the speed with which the data for indicators are collected, assembled, and published and the arrangement of the series for business cycle studies. Electronic computers are used for many of the computations, thus making early publication possible. Publication is scheduled for about the 20th of the month following the month of data.

About 70 principal indicators and over 300 components are used for the different measures shown. The movements of the series are shown against the background of the expansions and contractions of the general business cycle so that "leads" and "lags" can be readily detected and unusual cyclical developments spotted. The exact number of series included for the total and important classes of series may vary from month to month because of additions of new series and revisions in the composition of indexes. Almost all of the basic data are available in published reports. A complete list of the series and the sources of data is shown on the back cover of this report. All the data shown are seasonally adjusted where seasonal variations appear to exist.

## ORGANIZATION AND CONTENT OF THE REPORT

Three types of data are shown in this report. They are as follows:

**Basic data** (chart 1 and table 1).—Over 50 business cycle indicators and 20 additional series with business cycle significance are included. Together they provide a broad view of current and prospective business cycle fluctuations in the economy as well as the basis for making an economic interpretation of these fluctuations.

**Analytical measures** (charts 2-3 and tables 2-7).—These are measures which aid in forming a judgment of (1) the magnitude of current changes compared to previous changes, (2) the imminence of a turning point in the business cycle, and (3) the extent of current changes in different parts of the economy. They also aid in pointing to developments in particular industries and places.

**Cyclical patterns** (charts 4-5 and tables 8-10).—The current cyclical change is compared with changes at corresponding stages of earlier cycles. These comparisons are made in different ways depending upon the phase of the business cycle.

In addition to the data shown as part of the regular report, certain appendix materials are presented. These materials include historical data, key information, and adjustment factors.

## DESCRIPTIONS AND PROCEDURES

### Business Cycle Series

The three major groups of series are those with a fairly consistent timing relation to the business cycle. They are grouped, in accordance with the NBER classification, as "leading," "roughly coincident," or "lagging" indicators. Additional series are also included for a more complete coverage of the national economy. The series are described as follows:

**NBER Leading Indicators.**—Around 30 series usually reach peaks or troughs before those in aggregate economic activity as measured by the roughly coincident series (see below). For this reason, they are designated as "leading" series. One group of these series pertains to activities in the labor market, another to orders and contracts, and so on.

**NBER Roughly Coincident Indicators.**—About 15 series are direct measures of aggregate economic activity or move roughly together with it; for example, nonagricultural employment, industrial production or retail sales. For this reason they are referred to as "roughly coincident" series.

**NBER Lagging Indicators.**—Some series, such as new plant and equipment expenditures and manufacturers' inventories, usually have reached turning points after they were reached in aggregate economic activity, and for this reason, they are designated as "lagging" series.

**Other series.**—About 20 additional U.S. series with business cycle significance are also shown. Some of these series, such as change in money supply, merchandise trade balance, and cash surplus or deficit, represent important factors in the economy, but they have not qualified as indicators for various reasons, such as irregularity in timing. Finally, industrial production indexes for several countries which have important trade relations with the United States are presented.

## Descriptions and Procedures

### Seasonal Adjustments

Official seasonally adjusted data are used in this report wherever they are available. However, for the special purposes of business cycle studies, a number of series that are not ordinarily published in seasonally adjusted form are shown on a seasonally adjusted basis in this report. These series are as follows:

4. Number of persons on temporary layoff, all industries
5. Initial claims for unemployment insurance, State programs
9. Construction contracts awarded for commercial and industrial buildings, floor space
13. Number of new business incorporations
14. Current liabilities of business failures
15. Number of business failures with liabilities of \$100,000 and over
18. Profits (before taxes) per dollar of sales, all manufacturing corporations
25. Change in manufacturers' unfilled orders, durable goods industries
30. Nonagricultural placements, all industries
45. Average weekly insured unemployment, State programs
55. Index of wholesale prices, all commodities other than farm products and foods
81. Index of consumer prices
82. Federal cash payments to the public
83. Federal cash receipts from the public
84. Federal cash surplus or deficit
90. Defense Department obligations, procurement
91. Defense Department obligations, total
92. Military prime contract awards to U.S. business firms
125. West Germany, index of industrial production
128. Japan, index of industrial production

Seasonal adjustments for these series were developed by either the Bureau of the Census or the NBER. The adjustment factors used are shown in the appendix, table D. Seasonally adjusted data prepared by the collecting agency will be substituted for the series mentioned above whenever they are published.

### Designation of Business Cycle Turning Points

The historical business cycle turning points are those designated by the NBER. They mark the approximate date when aggregate economic activity reached its cyclical high or low levels. As a matter of general practice, a business cycle turning point will not be designated until at least 6 months after it has occurred.

### Charts

Time series line charts (charts 1-3) are used to show the cyclical timing and pattern of each series. Since various ratio and arithmetic scales are used, rates of change are not comparable except for those series having the same scale. See the diagram, page 4, for additional help in using the charts.

Shaded areas on the charts indicate periods of business cycle contraction between reference dates for peaks ("P"—beginnings of shaded areas) and

troughs ("T"—ends of shaded areas). The shading for a recession period will be entered only after a trough has been designated.

### Analytical Measures of Current Change

Four kinds of analytical measures are presented—rates of change, diffusion indexes, timing distributions, and direction-of-change tables. These measures aid in forming a judgment of the magnitude of current changes compared to previous changes, the imminence of a turning point in the business cycle, and the extent of current changes in different parts of the economy. They also point to developments in particular industries and places.

Rates of change.—There is considerable interest in the rate of acceleration during expansions and the rate of retardation during recessions. For this reason, rates of change for the principal monthly and quarterly business cycle series are included in table 2 of this report. Rates of change are helpful in judging and appraising trends of acceleration or retardation in a current business cycle phase, despite the fact that the erratic nature of month-to-month rates of change often makes it difficult to determine the significance of a change until some months after it has occurred. For series, such as unemployment and layoffs, which usually move down during expansions and up during recessions, the changes are inverted so that, in table 2, rises are shown as declines and declines as rises.

Diffusion indexes.—Diffusion indexes are simple summary measures of groups of economic series. They express, for a given group, the percent of the series which has risen over given intervals of time. Their turning points tend to lead the turning points of the aggregate and they measure how widespread a business change is. They vary between the limits of 100 (all components rising) and zero (all components falling). Widespread increases are often associated with rapid growth in aggregate activity, and widespread declines with sharp reductions.

The diffusion indexes in this report are grouped according to the timing classification of the NBER. For monthly series, two comparison intervals are used: 1-month intervals (January-February, February-March, etc.) and 3-month intervals (January-April, February-May, etc.). The indexes based on 1-month intervals are more "current" but they are also more irregular than the 3-month indexes (see chart 2). Quarterly series are compared over 1-quarter intervals and 4-quarter intervals.

Series numbers preceded by the letter "D" designate diffusion indexes. When one of these numbers corresponds to a basic indicator series number, it means that the diffusion index has been computed from components of the indicator series; for example, the diffusion index numbered "D6" is computed from components of series number 6. Diffusion indexes not computed from basic series components are assigned new numbers.

This report includes 29 diffusion indexes based on 16 indicator series (see tables 5 and 6). Seventeen of these indexes are computed by the Bureau of the Census utilizing nearly 300 components of 9 indicators (D1, D5, D6, D19, D23, D41, D47, D54,

and D58). Indexes for 8 of these indicators show comparisons for components over both 3-month and 1-month spans while, for 1 indicator (D58), comparisons are over 1-month spans only. The 12 other diffusion indexes are based on 7 indicators closely related to the above 9 indicators. They include two indexes on capital appropriations (602 companies and 15 industries)—NBER indexes based on data from the National Industrial Conference Board; the Chicago Purchasing Agents Association index based on monthly reports of changes in profits (200 companies); the First National City Bank of New York index based on quarterly profit reports (600 companies); and 8 NBER diffusion indexes—actual and anticipated—for the following: Manufacturers' sales (800 companies) and new orders (400 companies), based on data from Dun and Bradstreet, Inc.; car-loadings (19 commodity groups), based on data from the Association of American Railroads; and new plant and equipment expenditures (16 industries), based on data from the Office of Business Economics and the Securities and Exchange Commission.

Diffusion indexes that are based on anticipations show what proportion of business enterprises (or industries) are forecasting a rise in activity. Comparisons with indexes based on actual changes show whether there is a generally optimistic bias or a lag in recognition of actual developments.

Diffusion indexes constructed on the basis of current data are often highly irregular and require careful judgment in their use and interpretation.

**Timing distributions.**—Distributions of current "highs" and "lows" appear to be helpful in identifying a turning point in the business cycle promptly after it occurs. Each month a timing distribution is constructed which shows the number of series reaching high (low) values during each of the recent expansion (contraction) months. The timing distribution is summarized by showing the number of series reaching new highs (lows) and the percent currently high (low) for each of several recent months (see table 3).

To provide historical perspective for interpreting the distribution of current highs, such distributions are shown for leading and coincident series as they appear 3 months before the peak of each of the earlier post-World War II expansions and at their peaks (see table 4).

To compile timing distributions, the data for each of the 50 business cycle indicators over the period of the current cyclical phase are scanned each month. During a business cycle contraction, the low value for each series is identified; during an expansion, the high value is identified. For inverted series, that is, series with negative conformity to the business cycle, high values are taken during contraction and low values during expansion. If the values for 2 or more months are equal, the latest date is taken as the low (high) month. In selecting these values, erratic values are disregarded, although it is, of course, difficult to identify an erratic value, particularly for the current month.

The letter "L" is used in the basic data table (table 1) to identify and highlight the current low values during contraction and the letter "H", to identify current high values during expansion. In

addition, these symbols are used to identify the low values preceding current highs and high values preceding current lows. These identifications facilitate an economic interpretation of the timing distribution since they show the month in which each economic activity reached its low or high.

Interpretations of timing distributions must be made in light of the fact that a contraction following a high value reached several months ago may be the result of an erratic fluctuation and that a new high may be reached in some future month. In short, when the percent currently high falls below 50 percent for both the leading and roughly coincident series, this does not necessarily signify that a business cycle peak has occurred. It may do so, but it may also simply reflect a short reversal in the upward movement.

**Direction-of-change tables.**—Direction-of-change tables show directions of change ("+" for rising, "o" for unchanged, and "-" for falling) in the components used for the diffusion indexes. These tables provide a convenient view of changing business conditions and are helpful in making an economic interpretation of the movements in the more highly aggregated statistical measures. That is, they show which economic activities went up, which went down, and how long such movements have persisted. They also help to show how a recession or recovery spreads from one sector of the economy to another.

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In forming a judgment about the current intensity and probable ultimate character of a cyclical fluctuation, some economists find it helpful to compare the behavior of the indicator series and diffusion indexes in the current business cycle phase with their behavior during the corresponding phase of previous business cycles. These comparisons are made in different ways depending upon the phase of the business cycle.

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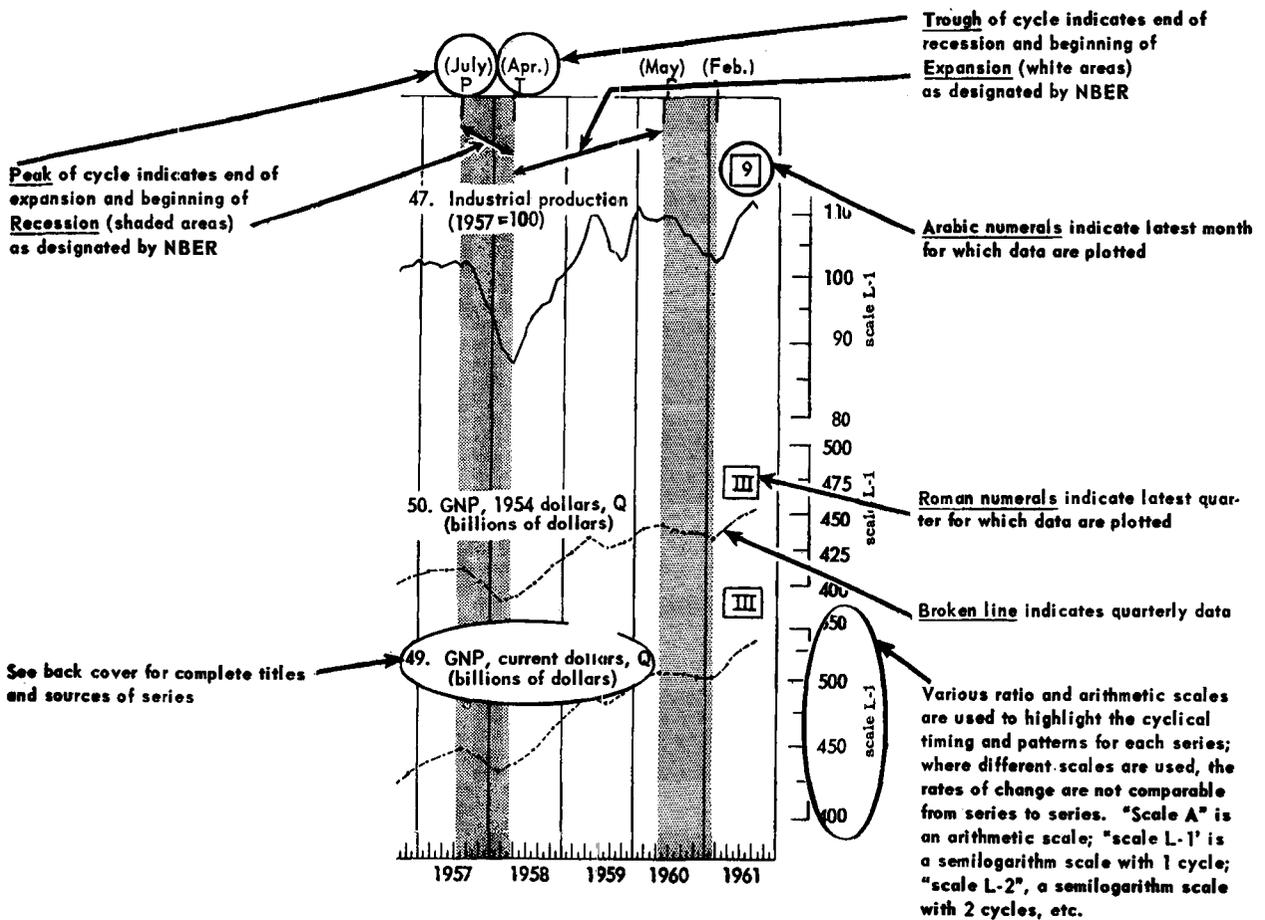
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The diffusion indexes in this report are grouped according to the timing classification of the NBER. For monthly series, two comparison intervals are used: 1-month intervals (January-February, February-March, etc.) and 3-month intervals (January-April, February-May, etc.). The indexes based on 1-month intervals are more "current" but they are also more irregular than the 3-month indexes (see chart 2). Quarterly series are compared over 1-quarter intervals and 4-quarter intervals.

Series numbers preceded by the letter "D" designate diffusion indexes. When one of these numbers corresponds to a basic indicator series number, it means that the diffusion index has been computed from components of the indicator series; for example, the diffusion index numbered "D6" is computed from components of series number 6. Diffusion indexes not computed from basic series components are assigned new numbers.

This report includes 29 diffusion indexes based on 16 indicator series (see tables 4 and 5). Seventeen of these indexes are computed by the Bureau of the Census utilizing nearly 300 components of 9 indicators (D1, D5, D6, D19, D23, D41, D47, D54,

and D58). Indexes for 8 of these indicators show comparisons for components over both 3-month and 1-month spans while, for 1 indicator (D58), comparisons are over 1-month spans only. The 12 other diffusion indexes are based on 7 indicators closely related to the above 9 indicators. They include two indexes on capital appropriations (602 companies and 15 industries)—NBER indexes based on data from the National Industrial Conference Board; the Chicago Purchasing Agents Association index based on monthly reports of changes in profits (200 companies); the First National City Bank of New York index based on quarterly profit reports (600 companies); and 8 NBER diffusion indexes—actual and anticipated—for the following: Manufacturers' sales (800 companies) and new orders (400 companies), based on data from Dun and Bradstreet, Inc.; carloadings (19 commodity groups), based on data from the Association of American Railroads; and new plant and equipment expenditures (16 industries), based on data from the Office of Business Economics and the Securities and Exchange Commission.

Diffusion indexes that are based on anticipations show what proportion of business enterprises (or industries) are forecasting a rise in activity. Comparisons with indexes based on actual changes show whether there is a generally optimistic bias or a lag in recognition of actual developments.

Diffusion indexes constructed on the basis of current data are often highly irregular and require careful judgment in their use and interpretation.

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To provide historical perspective for interpreting the distribution of current highs, such distributions are also shown for leading and coincident series as they appear 3 months before the peak of each of the earlier post-World War II expansions and at their peaks.

To compile timing distributions, the data for each of the 50 business cycle indicators over the period of the current cyclical phase are scanned each month. During a business cycle contraction, the low value for each series is identified; during an expansion, the high value is identified. For inverted series, that is, series with negative conformity to the business cycle, high values are taken during contraction and low values during expansion. If the values for 2 or more months are equal, the latest date is taken as the low (high) month. In selecting these values, erratic values are disregarded, although it is, of course, difficult to identify an erratic value, particularly for the current month.

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addition, these symbols are used to identify the low values preceding current highs and high values preceding current lows. These identifications facilitate an economic interpretation of the timing distribution since they show the month in which each economic activity reached its low or high.

Interpretations of timing distributions must be made in light of the fact that a contraction following a high value reached several months ago may be the result of an erratic fluctuation and that a new high may be reached in some future month. In short, when the percent currently high falls below 50 percent for both the leading and roughly coincident series, this does not necessarily signify that a business cycle peak has occurred. It may do so, but it may also simply reflect a short reversal in the upward movement.

Direction-of-change tables.—Direction-of-change tables show directions of change ("+" for rising, "o" for unchanged, and "-" for falling) in the components used for the diffusion indexes. These tables provide a convenient view of changing business conditions and are helpful in making an economic interpretation of the movements in the more highly aggregated statistical measures. That is, they show which economic activities went up, which went down, and how long such movements have persisted. They also help to show how a recession or recovery spreads from one sector of the economy to another.

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In forming a judgment about the current intensity and probable ultimate character of a cyclical fluctuation, some economists find it helpful to compare the behavior of the indicator series and diffusion indexes in the current business cycle phase with their behavior during the corresponding phase of previous business cycles. These comparisons are made in different ways depending upon the phase of the business cycle.

Contractions are compared by computing changes over the span from the most recent business cycle peak to the current month and over equal spans from previous reference peaks. This type of comparison is designated as representing changes from reference peak levels and from reference peak dates.

Expansions may be compared by measuring changes from the immediately preceding peak levels. In this report the current expansion is related to the May 1960 reference peak. For earlier expansions, percentage changes are also computed from their respective reference peaks to dates which are the same number of months beyond the succeeding reference troughs as the current expansion is beyond its reference trough. This type of comparison is designated as representing changes computed from reference peak levels and from reference trough dates. Although the spans from reference trough dates are the same for each expansion, the spans from the preceding peak dates are different, depending on the length of the contractions. This type of comparison answers the question whether, and by how much, the current level of activity exceeds or falls short of the level at the preceding business cycle peak, a given number of months after the recovery began, and how the current situation compares in this respect with earlier recoveries.

Descriptions and Procedures

Expansions also may be compared by computing changes from reference trough levels and from reference trough dates. This type of comparison measures the extent of the rise from the trough level so many months after the upswing began.

In addition to comparing cyclical fluctuations on the basis of reference dates (which are the same for all series), comparisons are made on the basis of specific peak and trough dates identified for each series. For example, the specific peak in retail sales corresponding to the May 1960 reference peak is April 1960; the specific peak in stock prices is July 1959.

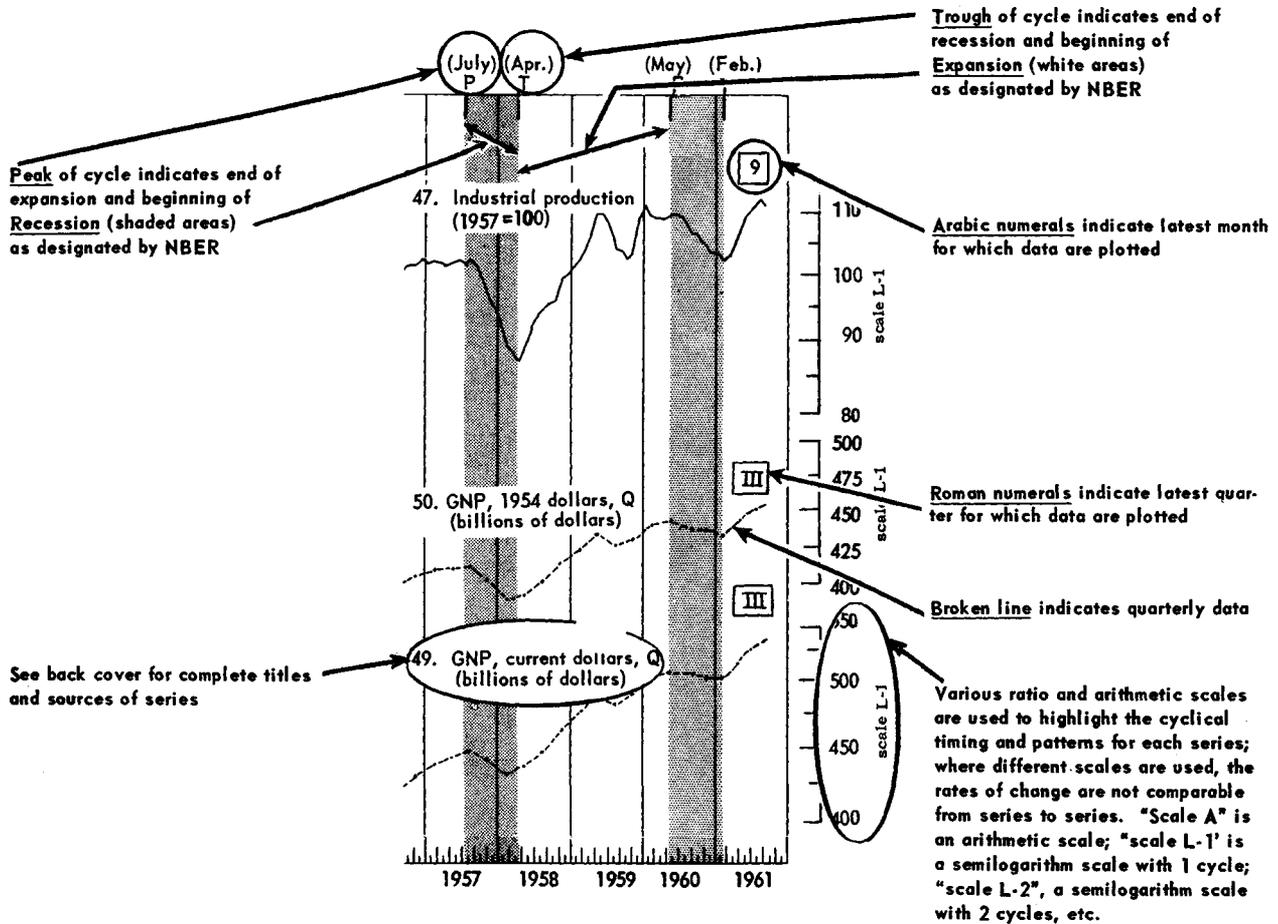
Recent performance in several individual indicators is compared graphically with that in earlier business cycles. In making graphic comparisons, the reference peak or trough levels are set equal to 100, and the reference peak or trough dates are aligned depending on the phase of the business cycle.

In order to make historical comparisons, it is frequently necessary to use data for a closely

related series for cycles prior to the initial date covered by the series used currently. Such comparisons are, therefore, to be considered only approximate. Nearly all series have undergone change in definition, coverage, or estimation procedure since 1919. The principal cases of this sort are as follows:

- 7. New private permanent nonfarm dwelling units started (prior to 1939: Residential building contracts, floor space)
- 41. Number of employees in nonagricultural establishments (prior to 1929: Employment in manufacturing)
- 52. Personal income (prior to 1929: Quarterly data as published by Barger and Klein)
- 54. Sales of retail stores (prior to 1935: Department store sales)
- 62. Index of wage and salary cost per unit of output, total manufacturing (prior to 1946: Production worker wage cost per unit. Supplements to wages and salaries, which are a part of total labor cost, are not included).

HOW TO READ THE TIME SERIES CHARTS (CHARTS 1-3)



# Business Cycle Developments

## INTRODUCTION

This report has been prepared to bring together many of the available economic indicators in convenient form for analysis and interpretation by specialists in business cycle analysis. The presentation and classification of series in this report follows the business indicators approach. The classification of series and the business cycle turning dates are those designated by the National Bureau of Economic Research (NBER) which, in recent years, has been the leader in this field of investigation. However, this publication is not to be taken as implying acceptance or endorsement by the Bureau of the Census or any other government agency of any particular approach to business cycle analysis. It is intended only to supplement other reports of the Department of Commerce that provide data for analyzing current business conditions.

The unique features are the arrangement of data according to their usual timing relations during the course of the business cycle and the inclusion of special analytical measures and historical cyclical comparisons that help in evaluating the current stage of the business cycle.

The chief merits of this report are the speed with which the data for indicators are collected, assembled, and published and the arrangement of the series for business cycle studies. Electronic computers are used for many of the computations, thus making early publication possible. Publication is scheduled for about the 20th of the month following the month of data.

About 70 principal indicators and over 300 components are used for the different measures shown. The movements of the series are shown against the background of the expansions and contractions of the general business cycle so that "leads" and "lags" can be readily detected and unusual cyclical developments spotted. The exact number of series included for the total and important classes of series may vary from month to month because of additions of new series and revisions in the composition of indexes. Almost all of the basic data are available in published reports. A complete list of the series and the sources of data is shown on the back cover of this report. All the data shown are seasonally adjusted where seasonal variations appear to exist.

## ORGANIZATION AND CONTENT OF THE REPORT

Three types of data are shown in this report. They are as follows:

**Basic data** (chart 1 and table 1).—Over 50 business cycle indicators and 20 additional series with business cycle significance are included. Together they provide a broad view of current and prospective business cycle fluctuations in the economy as well as the basis for making an economic interpretation of these fluctuations.

**Analytical measures** (charts 2-3 and tables 2-6).—These are measures which aid in forming a judgment of (1) the magnitude of current changes compared to previous changes, (2) the imminence of a turning point in the business cycle, and (3) the extent of current changes in different parts of the economy. They also aid in pointing to developments in particular industries and places.

**Cyclical patterns** (charts 4-5 and tables 7-9).—The current cyclical change is compared with changes at corresponding stages of earlier cycles. These comparisons are made in different ways depending upon the phase of the business cycle.

In addition to the data shown as part of the regular report, certain appendix materials are presented. These materials include historical data, key information, and adjustment factors.

## DESCRIPTIONS AND PROCEDURES

### Business Cycle Series

The three major groups of series are those with a fairly consistent timing relation to the business cycle. They are grouped, in accordance with the NBER classification, as "leading," "roughly coincident," or "lagging" indicators. Additional series are also included for a more complete coverage of the national economy. The series are described as follows:

**NBER Leading Indicators**.—Around 30 series usually reach peaks or troughs before those in aggregate economic activity as measured by the roughly coincident series (see below). For this reason, they are designated as "leading" series. One group of these series pertains to activities in the labor market, another to orders and contracts, and so on.

**NBER Roughly Coincident Indicators**.—About 15 series are direct measures of aggregate economic activity or move roughly together with it; for example, nonagricultural employment, industrial production or retail sales. For this reason they are referred to as "roughly coincident" series.

**NBER Lagging Indicators**.—Some series, such as new plant and equipment expenditures and manufacturers' inventories, usually have reached turning points after they were reached in aggregate economic activity, and for this reason, they are designated as "lagging" series.

**Other series**.—About 20 additional U.S. series with business cycle significance are also shown. Some of these series, such as change in money supply, merchandise trade balance, and cash surplus or deficit, represent important factors in the economy, but they have not qualified as indicators for various reasons, such as irregularity in timing. Finally, industrial production indexes for several countries which have important trade relations with the United States are presented.

## Descriptions and Procedures

### Seasonal Adjustments

Official seasonally adjusted data are used in this report wherever they are available. However, for the special purposes of business cycle studies, a number of series that are not ordinarily published in seasonally adjusted form are shown on a seasonally adjusted basis in this report. These series are as follows:

4. Number of persons on temporary layoff, all industries
5. Initial claims for unemployment insurance, State programs
9. Construction contracts awarded for commercial and industrial buildings, floor space
13. Number of new business incorporations
14. Current liabilities of business failures
15. Number of business failures with liabilities of \$100,000 and over
18. Profits (before taxes) per dollar of sales, all manufacturing corporations
25. Change in manufacturers' unfilled orders, durable goods industries
30. Nonagricultural placements, all industries
45. Average weekly insured unemployment, State programs
55. Index of wholesale prices, all commodities other than farm products and foods
81. Index of consumer prices
82. Federal cash payments to the public
83. Federal cash receipts from the public
84. Federal cash surplus or deficit
90. Defense Department obligations, procurement
91. Defense Department obligations, total
92. Military prime contract awards to U.S. business firms
125. West Germany, index of industrial production
128. Japan, index of industrial production

Seasonal adjustments for these series were developed by either the Bureau of the Census or the NBER. The adjustment factors used are shown in the appendix table D. Seasonally adjusted data prepared by the collecting agency will be substituted for the series mentioned above whenever they are published.

### Designation of Business Cycle Turning Points

The historical business cycle turning points are those designated by the NBER. They mark the approximate date when aggregate economic activity reached its cyclical high or low levels. As a matter of general practice, a business cycle turning point will not be designated until at least 6 months after it has occurred.

### Charts

Time series line charts (charts 1-3) are used to show the cyclical timing and pattern of each series. Since various ratio and arithmetic scales are used, rates of change are not comparable except for those series having the same scale. See the diagram, page 4, for additional help in using the charts.

Shaded areas on the charts indicate periods of business cycle contraction between reference dates for peaks ("P"—beginnings of shaded areas) and

troughs ("T"—ends of shaded areas). The shading for a recession period will be entered only after a trough has been designated.

### Analytical Measures of Current Change

Four kinds of analytical measures are presented—rates of change, diffusion indexes, timing distributions, and direction-of-change tables. These measures aid in forming a judgment of the magnitude of current changes compared to previous changes, the imminence of a turning point in the business cycle, and the extent of current changes in different parts of the economy. They also point to developments in particular industries and places.

Rates of change.—There is considerable interest in the rate of acceleration during expansions and the rate of retardation during recessions. For this reason, rates of change for the principal monthly and quarterly business cycle series are included in table 2 of this report. Rates of change are helpful in judging and appraising trends of acceleration or retardation in a current business cycle phase, despite the fact that the erratic nature of month-to-month rates of change often makes it difficult to determine the significance of a change until some months after it has occurred. For series, such as unemployment and layoffs, which usually move down during expansions and up during recessions, the changes are inverted so that, in table 2, rises are shown as declines and declines as rises.

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The diffusion indexes in this report are grouped according to the timing classification of the NBER. For monthly series, two comparison intervals are used: 1-month intervals (January-February, February-March, etc.) and 3-month intervals (January-April, February-May, etc.). The indexes based on 1-month intervals are more "current" but they are also more irregular than the 3-month indexes (see chart 2). Quarterly series are compared over 1-quarter intervals and 4-quarter intervals.

Series numbers preceded by the letter "D" designate diffusion indexes. When one of these numbers corresponds to a basic indicator series number, it means that the diffusion index has been computed from components of the indicator series; for example, the diffusion index numbered "D6" is computed from components of series number 6. Diffusion indexes not computed from basic series components are assigned new numbers.

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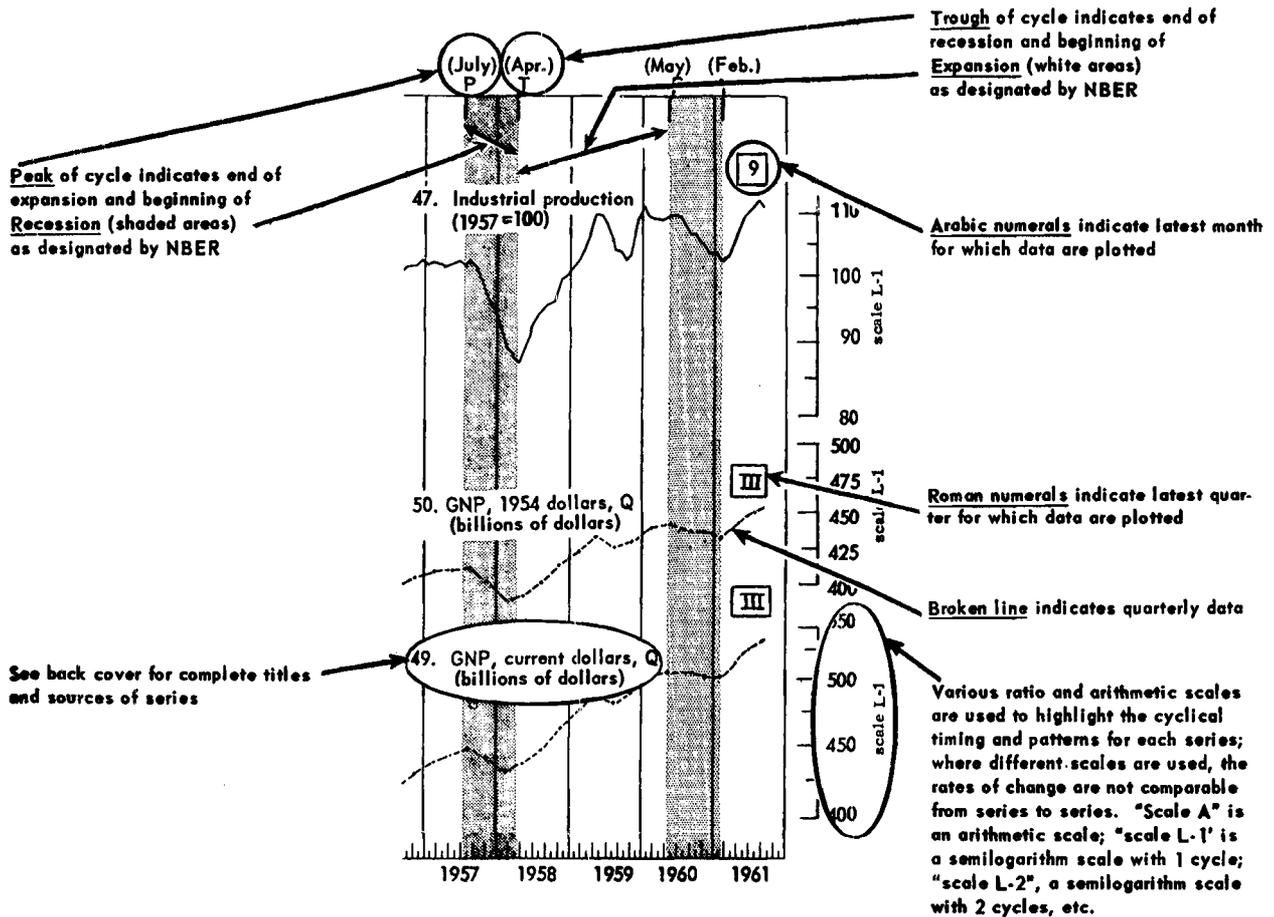
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## 2 Descriptions and Procedures

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Time series line charts (charts 1-3) are used to show the cyclical timing and pattern of each series. Since various ratio and arithmetic scales are used, rates of change are not comparable except for those series having the same scale. See the diagram, page 4, for additional help in using the charts.

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Four kinds of analytical measures are presented—rates of change, diffusion indexes, timing distributions, and direction-of-change tables. These measures aid in forming a judgment of the magnitude of current changes compared to previous changes, the imminence of a turning point in the business cycle, and the extent of current changes in different parts of the economy. They also point to developments in particular industries and places.

**Rates of change.**—There is considerable interest in the rate of acceleration during expansions and the rate of retardation during recessions. For this reason, rates of change for the principal monthly and quarterly business cycle series are included in table 2 of this report. Rates of change are helpful in judging and appraising trends of acceleration or retardation in a current business cycle phase, despite the fact that the erratic nature of month-to-month rates of change often makes it difficult to determine the significance of a change until some months after it has occurred. For series, such as unemployment and layoffs, which usually move down during expansions and up during recessions, the changes are inverted so that, in table 2, rises are shown as declines and declines as rises.

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Series numbers preceded by the letter "D" designate diffusion indexes. When one of these numbers corresponds to a basic indicator series number, it means that the diffusion index has been computed from components of the indicator series; for example, the diffusion index numbered "D6" is computed from components of series number 6. Diffusion indexes not computed from basic series components are assigned new numbers.

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and D58). Indexes for 8 of these indicators show comparisons for components over both 3-month and 1-month spans while, for 1 indicator (D58), comparisons are over 1-month spans only. The 12 other diffusion indexes are based on 7 indicators closely related to the above 9 indicators. They include two indexes on capital appropriations (602 companies and 15 industries)—NBER indexes based on data from the National Industrial Conference Board; the Chicago Purchasing Agents Association index based on monthly reports of changes in profits (200 companies); the First National City Bank of New York index based on quarterly profit reports (700 companies); and 8 NBER diffusion indexes—actual and anticipated—for the following: Manufacturers' sales (800 companies) and new orders (400 companies), based on data from Dun and Bradstreet, Inc.; carloadings (19 commodity groups), based on data from the Association of American Railroads; and new plant and equipment expenditures (16 industries), based on data from the Office of Business Economics and the Securities and Exchange Commission.

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Diffusion indexes constructed on the basis of current data are often highly irregular and require careful judgment in their use and interpretation.

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To provide historical perspective for interpreting the distribution of current highs, such distributions are also shown for leading and coincident series as they appear 3 months and 6 months before the peak of each of the earlier post-World War II expansions and at their peaks.

To compile timing distributions, the data for each of the 50 business cycle indicators over the period of the current cyclical phase are scanned each month. During a business cycle contraction, the low value for each series is identified; during an expansion, the high value is identified. For inverted series, that is, series with negative conformity to the business cycle, high values are taken during contraction and low values during expansion. If the values for 2 or more months are equal, the latest date is taken as the low (high) month. In selecting these values, erratic values are disregarded, although it is, of course, difficult to identify an erratic value, particularly for the current month.

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addition, these symbols are used to identify the low values preceding current highs and high values preceding current lows. These identifications facilitate an economic interpretation of the timing distribution since they show the month in which each economic activity reached its low or high.

Interpretations of timing distributions must be made in light of the fact that a contraction following a high value reached several months ago may be the result of an erratic fluctuation and that a new high may be reached in some future month. In short, when the percent currently high falls below 50 percent for both the leading and roughly coincident series, this does not necessarily signify that a business cycle peak has occurred. It may do so, but it may also simply reflect a short reversal in the upward movement.

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In forming a judgment about the current intensity and probable ultimate character of a cyclical fluctuation, some economists find it helpful to compare the behavior of the indicator series and diffusion indexes in the current business cycle phase with their behavior during the corresponding phase of previous business cycles. These comparisons are made in different ways depending upon the phase of the business cycle.

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Expansions may be compared by measuring changes from the immediately preceding peak levels. In this report the current expansion is related to the May 1960 reference peak. For earlier expansions, percentage changes are also computed from their respective reference peaks to dates which are the same number of months beyond the succeeding reference troughs as the current expansion is beyond its reference trough. This type of comparison is designated as representing changes computed from reference peak levels and from reference trough dates. Although the spans from reference trough dates are the same for each expansion, the spans from the preceding peak dates are different, depending on the length of the contractions. This type of comparison answers the question whether, and by how much, the current level of activity exceeds or falls short of the level at the preceding business cycle peak, a given number of months after the recovery began, and how the current situation compares in this respect with earlier recoveries.

Expansions also may be compared by computing changes from reference trough levels and from reference trough dates. This type of comparison measures the extent of the rise from the trough level so many months after the upswing began.

In addition to comparing cyclical fluctuations on the basis of reference dates (which are the same for all series), comparisons are made on the basis of specific peak and trough dates identified for each series. For example, the specific peak in retail sales corresponding to the May 1960 reference peak is April 1960; the specific peak in stock prices is July 1959.

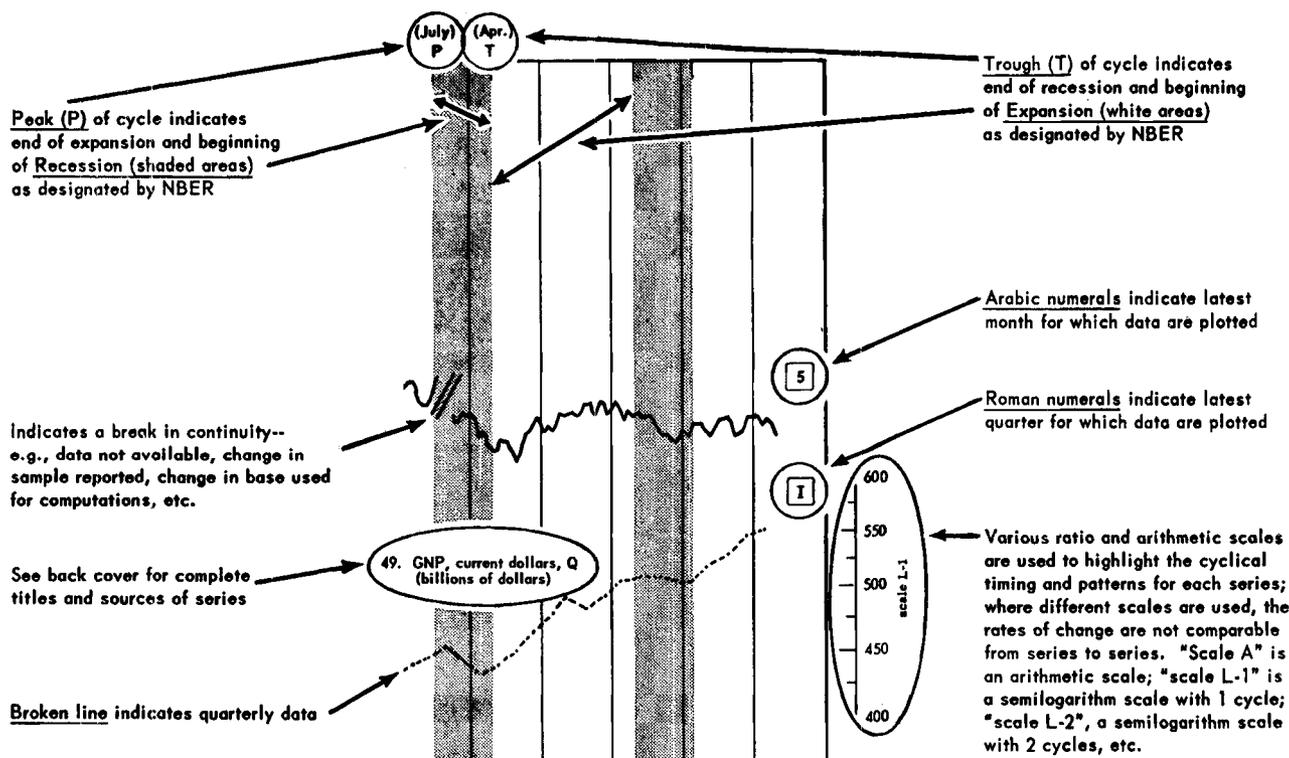
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related series for cycles prior to the initial date covered by the series used currently. Such comparisons are, therefore, to be considered only approximate. Nearly all series have undergone change in definition, coverage, or estimation procedure since 1919. The principal cases of this sort are as follows:

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HOW TO READ THE TIME SERIES CHARTS (CHARTS 1-3)



# Business Cycle Developments

## INTRODUCTION

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The unique features are the arrangement of data according to their usual timing relations during the course of the business cycle and the inclusion of special analytical measures and historical cyclical comparisons that help in evaluating the current stage of the business cycle.

The chief merits of this report are the speed with which the data for indicators are collected, assembled, and published and the arrangement of the series for business cycle studies. Electronic computers are used for many of the computations, thus making early publication possible. Publication is scheduled for about the 20th of the month following the month of data.

About 70 principal indicators and over 300 components are used for the different measures shown. The movements of the series are shown against the background of the expansions and contractions of the general business cycle so that "leads" and "lags" can be readily detected and unusual cyclical developments spotted. The exact number of series included for the total and important classes of series may vary from month to month because of additions of new series and revisions in the composition of indexes. Almost all of the basic data are available in published reports. A complete list of the series and the sources of data is shown on the back cover of this report. All the data shown are seasonally adjusted where seasonal variations appear to exist.

## ORGANIZATION AND CONTENT OF THE REPORT

Three types of data are shown in this report. They are as follows:

Basic data (chart 1 and table 1).—Over 50 business cycle indicators and 20 additional series with business cycle significance are included. Together they provide a broad view of current and prospective business cycle fluctuations in the economy as well as the basis for making an economic interpretation of these fluctuations.

Analytical measures (charts 2-3 and tables 2-6).—These are measures which aid in forming a judgment of (1) the magnitude of current changes compared to previous changes, (2) the imminence of a turning point in the business cycle, and (3) the extent of current changes in different parts of the economy. They also aid in pointing to developments in particular industries and places.

Cyclical patterns (charts 4-5 and tables 7-9).—The current cyclical change is compared with changes at corresponding stages of earlier cycles. These comparisons are made in different ways depending upon the phase of the business cycle.

In addition to the data shown as part of the regular report, certain appendix materials are presented. These materials include historical data, key information, and adjustment factors.

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### Business Cycle Series

The three major groups of series are those with a fairly consistent timing relation to the business cycle. They are grouped, in accordance with the NBER classification, as "leading," "roughly coincident," or "lagging" indicators. Additional series are also included for a more complete coverage of the national economy. The series are described as follows:

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NBER Roughly Coincident Indicators.—About 15 series are direct measures of aggregate economic activity or move roughly together with it; for example, nonagricultural employment, industrial production or retail sales. For this reason they are referred to as "roughly coincident" series.

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Other series.—About 20 additional U.S. series with business cycle significance are also shown. Some of these series, such as change in money supply, merchandise trade balance, and cash surplus or deficit, represent important factors in the economy, but they have not qualified as indicators for various reasons, such as irregularity in timing. Finally, industrial production indexes for several countries which have important trade relations with the United States are presented.

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Official seasonally adjusted data are used in this report wherever they are available. However, for the special purposes of business cycle studies, a number of series that are not ordinarily published in seasonally adjusted form are shown on a seasonally adjusted basis in this report. These series are as follows:

4. Number of persons on temporary layoff, all industries
5. Initial claims for unemployment insurance, State programs
9. Construction contracts awarded for commercial and industrial buildings, floor space
13. Number of new business incorporations
14. Current liabilities of business failures
15. Number of business failures with liabilities of \$100,000 and over
18. Profits (before taxes) per dollar of sales, all manufacturing corporations
25. Change in manufacturers' unfilled orders, durable goods industries
30. Nonagricultural placements, all industries
45. Average weekly insured unemployment, State programs
55. Index of wholesale prices, all commodities other than farm products and foods
81. Index of consumer prices
82. Federal cash payments to the public
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Seasonal adjustments for these series were developed by either the Bureau of the Census or the NBER. The adjustment factors used are shown in the appendix table D. Seasonally adjusted data prepared by the collecting agency will be substituted for the series mentioned above whenever they are published.

### Designation of Business Cycle Turning Points

The historical business cycle turning points are those designated by the NBER. They mark the approximate date when aggregate economic activity reached its cyclical high or low levels. As a matter of general practice, a business cycle turning point will not be designated until at least 6 months after it has occurred.

### Charts

Time series line charts (charts 1-3) are used to show the cyclical timing and pattern of each series. Since various ratio and arithmetic scales are used, rates of change are not comparable except for those series having the same scale. See the diagram, page 4, for additional help in using the charts.

Shaded areas on the charts indicate periods of business cycle contraction between reference dates for peaks ("P"—beginnings of shaded areas) and

troughs ("T"—ends of shaded areas). The shading for a recession period will be entered only after a trough has been designated.

### Analytical Measures of Current Change

Four kinds of analytical measures are presented—rates of change, diffusion indexes, timing distributions, and direction-of-change tables. These measures aid in forming a judgment of the magnitude of current changes compared to previous changes, the imminence of a turning point in the business cycle, and the extent of current changes in different parts of the economy. They also point to developments in particular industries and places.

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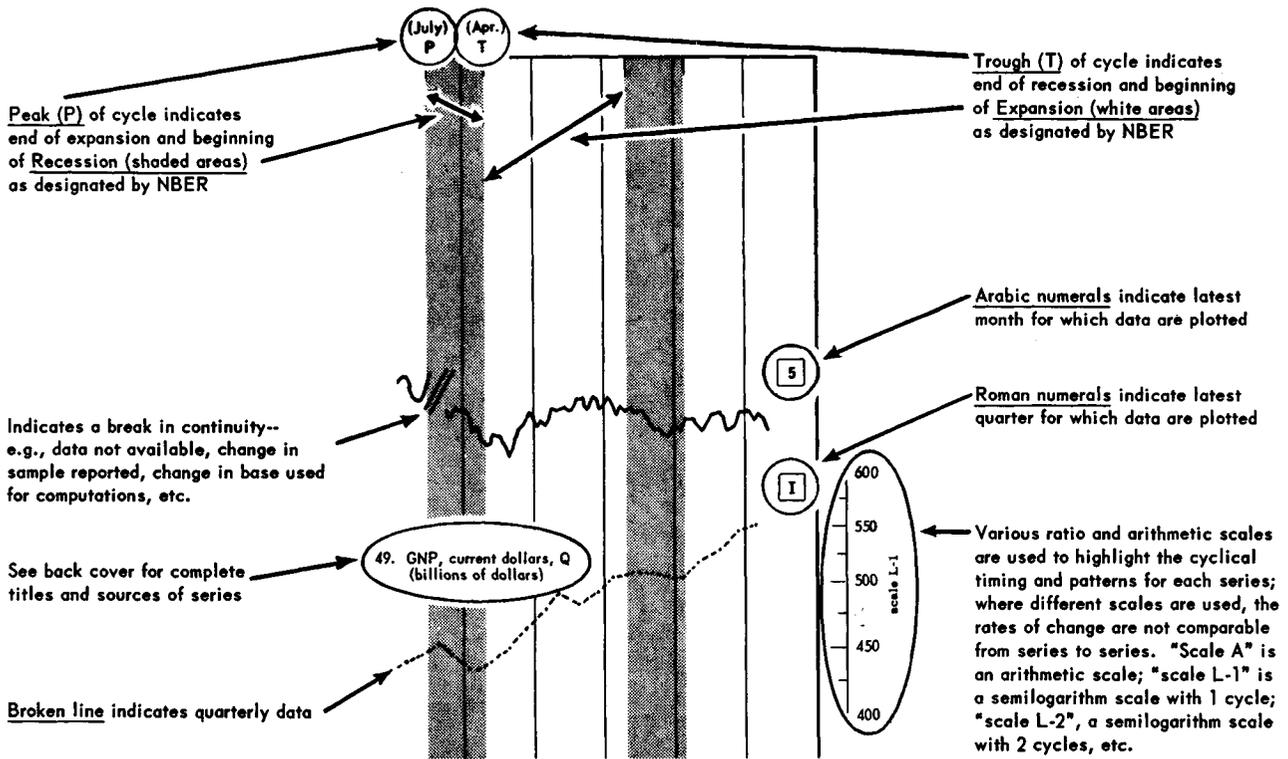
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### IMPORTANT FEATURES AND CHANGES FOR THIS ISSUE

A limited number of changes are made from time to time to reflect the change from one stage of the business cycle to another, to show new findings of business cycle research and newly available economic series, or to emphasize the activity of a particular series or series group. Such changes may involve additions or deletions of series used, changes in placement in relation to other series, changes in components of indexes, etc. These changes will be listed in this section each month. The changes made in this issue are as follows:

Series 85 on change in total U.S. money supply has been revised by the issuing agency to take account of new benchmark data, seasonal adjustment, and other factors.

### BACKGROUND MATERIALS

Experimental work for this report was carried out in collaboration with the NBER which is responsible for much of the early research in this field. The paper, "Signals of Recession and Recovery," contains an explanation of research findings helpful in interpreting current cyclical trends, a more detailed description of the indicators and measures used, and additional historical data. This paper was issued as Occasional Paper 77 of the National Bureau of Economic Research, 261 Madison Avenue, New York 16, N.Y. (207 pages, price \$3).

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**Diffusion indexes.**—Diffusion indexes are simple summary measures of groups of economic series. They express, for a given group, the percent of the series which has risen over given intervals of time. Their turning points tend to lead the turning points of the aggregate and they measure how widespread a business change is. They vary between the limits of 100 (all components rising) and zero (all components falling). Widespread increases are often associated with rapid growth in aggregate activity, and widespread declines with sharp reductions.

The diffusion indexes in this report are grouped according to the timing classification of the NBER. For monthly series, two comparison intervals are used: 1-month intervals (January-February, February-March, etc.) and 3-month intervals (January-April, February-May, etc.). The indexes based on 1-month intervals are more "current" but they are also more irregular than the 3-month indexes (see chart 2). Quarterly series are compared over 1-quarter intervals and 4-quarter intervals.

Series numbers preceded by the letter "D" designate diffusion indexes. When one of these numbers corresponds to a basic indicator series number, it means that the diffusion index has been computed from components of the indicator series; for example, the diffusion index numbered "D6" is computed from components of series number 6. Diffusion indexes not computed from basic series components are assigned new numbers.

This report includes 29 diffusion indexes based on 16 indicator series (see tables 4 and 5). Seventeen of these indexes are computed by the Bureau of the Census utilizing nearly 300 components of 9 indicators (D1, D5, D6, D19, D23, D41, D47, D54,

and D58). Indexes for 8 of these indicators show comparisons for components over both 3-month and 1-month spans while, for 1 indicator (D58), comparisons are over 1-month spans only. The 12 other diffusion indexes are based on 7 indicators closely related to the above 9 indicators. They include two indexes on capital appropriations (602 companies and 15 industries)—NBER indexes based on data from the National Industrial Conference Board; the Chicago Purchasing Agents Association index based on monthly reports of changes in profits (200 companies); the First National City Bank of New York index based on quarterly profit reports (700 companies); and 8 NBER diffusion indexes—actual and anticipated—for the following: Manufacturers' sales (800 companies) and new orders (400 companies), based on data from Dun and Bradstreet, Inc.; carloadings (19 commodity groups), based on data from the Association of American Railroads; and new plant and equipment expenditures (16 industries), based on data from the Office of Business Economics and the Securities and Exchange Commission.

Diffusion indexes that are based on anticipations show what proportion of business enterprises (or industries) are forecasting a rise in activity. Comparisons with indexes based on actual changes show whether there is a generally optimistic bias or a lag in recognition of actual developments.

Diffusion indexes constructed on the basis of current data are often highly irregular and require careful judgment in their use and interpretation.

**Timing distributions.**—Distributions of current "highs" and "lows" appear to be helpful in appraising the evidence for a prospective business cycle turning point. Each month a timing distribution is constructed which shows the number of series reaching high (low) values during each of the recent expansion (contraction) months. The timing distribution is summarized by showing the number of series reaching new highs (lows) and the percent currently high (low) for each of several recent months (see table 3).

To provide historical perspective for interpreting the distribution of current highs, such distributions are also shown for leading and coincident series as they appear 3 months and 6 months before the peak of each of the earlier post-World War II expansions and at their peaks.

To compile timing distributions, the data for each of the 50 business cycle indicators over the period of the current cyclical phase are scanned each month. During a business cycle contraction, the low value for each series is identified; during an expansion, the high value is identified. For inverted series, that is, series with negative conformity to the business cycle, high values are taken during contraction and low values during expansion. If the values for 2 or more months are equal, the latest date is taken as the low (high) month. In selecting these values, erratic values are disregarded, although it is, of course, difficult to identify an erratic value, particularly for the current month.

The letter "L" is used in the basic data table (table 1) to identify and highlight the current low values during contraction and the letter "H", to identify current high values during expansion. In

addition, these symbols are used to identify the low values preceding current highs and high values preceding current lows. These identifications facilitate an economic interpretation of the timing distribution since they show the month in which each economic activity reached its low or high.

Interpretations of timing distributions must be made in light of the fact that a contraction following a high value reached several months ago may be the result of an erratic fluctuation and that a new high may be reached in some future month. In short, when the percent currently high falls below 50 percent for both the leading and roughly coincident series, this does not necessarily signify that a business cycle peak has occurred. It may do so, but it may also simply reflect a short reversal in the upward movement.

**Direction-of-change tables.**—Direction-of-change tables show directions of change ("+" for rising, "o" for unchanged, and "-" for falling) in the components used for the diffusion indexes. These tables provide a convenient view of changing business conditions and are helpful in making an economic interpretation of the movements in the more highly aggregated statistical measures. That is, they show which economic activities went up, which went down, and how long such movements have persisted. They also help to show how a recession or recovery spreads from one sector of the economy to another.

### Comparisons of Cyclical Patterns

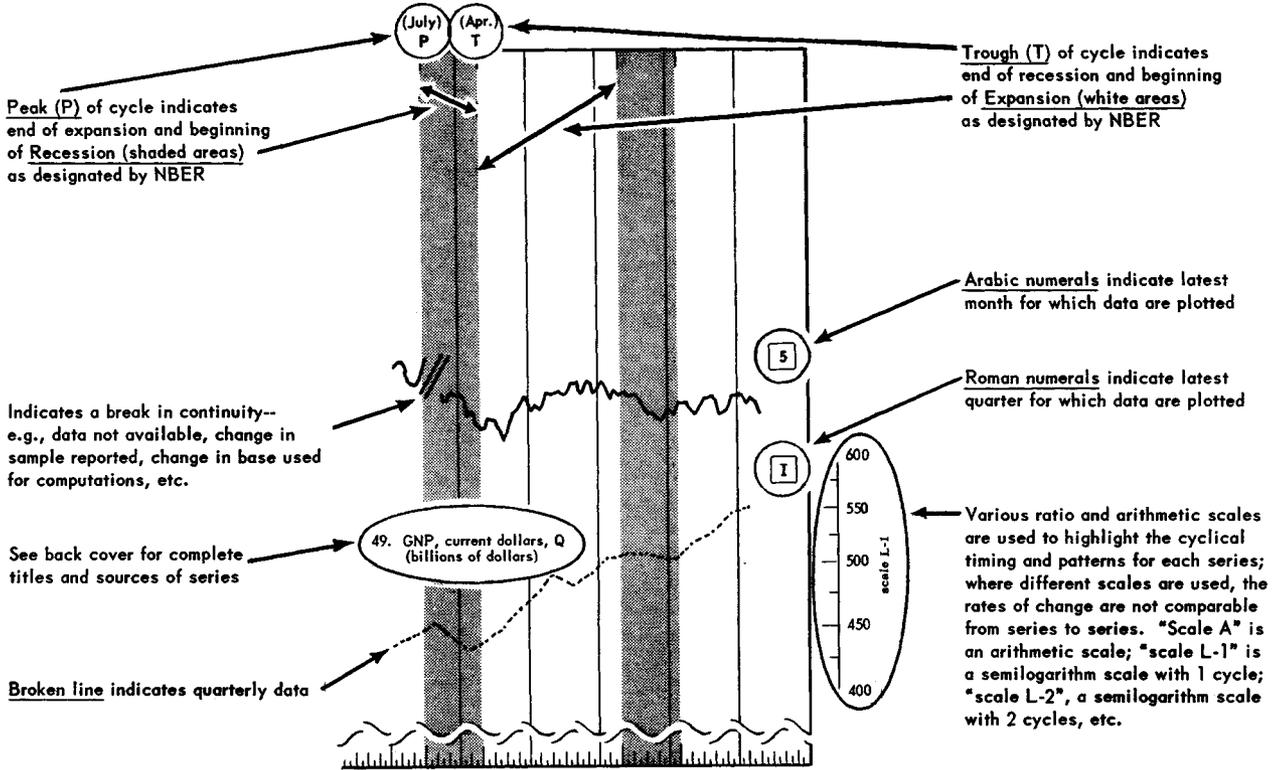
In forming a judgment about the current intensity and probable ultimate character of a cyclical fluctuation, some economists find it helpful to compare the behavior of the indicator series and diffusion indexes in the current business cycle phase with their behavior during the corresponding phase of previous business cycles. These comparisons are made in different ways depending upon the phase of the business cycle.

Contractions are compared by computing changes over the span from the most recent business cycle peak to the current month and over equal spans from previous reference peaks. This type of comparison is designated as representing changes from reference peak levels and from reference peak dates.

Expansions may be compared by measuring changes from the immediately preceding peak levels. In this report the current expansion is related to the May 1960 reference peak. For earlier expansions, percentage changes are also computed from their respective reference peaks to dates which are the same number of months beyond the succeeding reference troughs as the current expansion is beyond its reference trough. This type of comparison is designated as representing changes computed from reference peak levels and from reference trough dates. Although the spans from reference trough dates are the same for each expansion, the spans from the preceding peak dates are different, depending on the length of the contractions. This type of comparison answers the question whether, and by how much, the current level of activity exceeds or falls short of the level at the preceding business cycle peak, a given number of months after the recovery began, and how the current situation compares in this respect with earlier recoveries.

### Descriptions and Procedures

#### HOW TO READ THE TIME SERIES CHARTS (CHARTS 1-3)



**IMPORTANT FEATURES AND CHANGES FOR THIS ISSUE**

A limited number of changes are made from time to time to reflect the change from one stage of the business cycle to another, to show new findings of business cycle research and newly available economic series, or to emphasize the activity of a particular series or series group. Such changes may involve additions or deletions of series used, changes in placement in relation to other series, changes in components of indexes, etc. These changes will be listed in this section each month. The changes made in this issue are as follows:

There are no significant changes for this issue.

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**BACKGROUND MATERIALS**

Experimental work for this report was carried out in collaboration with the National Bureau of Economic Research which is responsible for much of the early research in this field. The book, "Signals of Recession and Recovery," contains an explanation of research findings helpful in interpreting current cyclical trends, a more detailed description of the indicators and measures used, and additional historical data. This book was issued as Occasional Paper 77 of the National Bureau of Economic Research, 261 Madison Avenue, New York 16, N.Y. (207 pages, price \$3). Other references, both to historical studies and current interpretations of the indicators, appear in this book.

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# Business Cycle Developments

## INTRODUCTION

This report has been prepared to bring together many of the available economic indicators in convenient form for analysis and interpretation by specialists in business cycle analysis. The presentation and classification of series in this report follows the business indicators approach. The classification of series and the business cycle turning dates are those designated by the National Bureau of Economic Research (NBER) which, in recent years, has been the leader in this field of investigation. However, this publication is not to be taken as implying acceptance or endorsement by the Bureau of the Census or any other government agency of any particular approach to business cycle analysis. It is intended only to supplement other reports of the Department of Commerce that provide data for analyzing current business conditions.

The unique features are the arrangement of data according to their usual timing relations during the course of the business cycle and the inclusion of special analytical measures and historical cyclical comparisons that help in evaluating the current stage of the business cycle.

The chief merits of this report are the speed with which the data for indicators are collected, assembled, and published and the arrangement of the series for business cycle studies. Electronic computers are used for many of the computations, thus making early publication possible. Publication is scheduled for about the 20th of the month following the month of data.

About 70 principal indicators and over 300 components are used for the different measures shown. The movements of the series are shown against the background of the expansions and contractions of the general business cycle so that "leads" and "lags" can be readily detected and unusual cyclical developments spotted. The exact number of series included for the total and important classes of series may vary from month to month because of additions of new series and revisions in the composition of indexes. Almost all of the basic data are available in published reports. A complete list of the series and the sources of data is shown on the back cover of this report. All the data shown are seasonally adjusted where seasonal variations appear to exist.

## ORGANIZATION AND CONTENT OF THE REPORT

Three types of data are shown in this report. They are as follows:

**Basic data** (chart 1 and table 1).—Over 50 business cycle indicators and 20 additional series with business cycle significance are included. Together they provide a broad view of current and prospective business cycle fluctuations in the economy as well as the basis for making an economic interpretation of these fluctuations.

**Analytical measures** (charts 2-3 and tables 2-6).—These are measures which aid in forming a judgment of (1) the magnitude of current changes compared to previous changes, (2) the imminence of a turning point in the business cycle, and (3) the extent of current changes in different parts of the economy. They also aid in pointing to developments in particular industries and places.

**Cyclical patterns** (charts 4-5 and tables 7-9).—The current cyclical change is compared with changes at corresponding stages of earlier cycles. These comparisons are made in different ways depending upon the phase of the business cycle.

In addition to the data shown as part of the regular report, certain appendix materials are presented. These materials include historical data, key information, and adjustment factors.

## DESCRIPTIONS AND PROCEDURES

### Business Cycle Series

The three major groups of series are those with a fairly consistent timing relation to the business cycle. They are grouped, in accordance with the NBER classification, as "leading," "roughly coincident," or "lagging" indicators. Additional series are also included for a more complete coverage of the national economy. The series are described as follows:

**NBER Leading Indicators**.—Around 30 series usually reach peaks or troughs before those in aggregate economic activity as measured by the roughly coincident series (see below). For this reason, they are designated as "leading" series. One group of these series pertains to activities in the labor market, another to orders and contracts, and so on.

**NBER Roughly Coincident Indicators**.—About 15 series are direct measures of aggregate economic activity or move roughly together with it; for example, nonagricultural employment, industrial production or retail sales. For this reason they are referred to as "roughly coincident" series.

**NBER Lagging Indicators**.—Some series, such as new plant and equipment expenditures and manufacturers' inventories, usually have reached turning points after they were reached in aggregate economic activity, and for this reason, they are designated as "lagging" series.

**Other series**.—About 20 additional U.S. series with business cycle significance are also shown. Some of these series, such as change in money supply, merchandise trade balance, and cash surplus or deficit, represent important factors in the economy, but they have not qualified as indicators for various reasons, such as irregularity in timing. Finally, industrial production indexes for several countries which have important trade relations with the United States are presented.

## Descriptions and Procedures

### Seasonal Adjustments

Official seasonally adjusted data are used in this report wherever they are available. However, for the special purposes of business cycle studies, a number of series that are not ordinarily published in seasonally adjusted form are shown on a seasonally adjusted basis in this report. These series are as follows:

4. Number of persons on temporary layoff, all industries
5. Average weekly claims for unemployment insurance, State programs
9. Construction contracts awarded for commercial and industrial buildings, floor space
13. Number of new business incorporations
14. Current liabilities of business failures
15. Number of business failures with liabilities of \$100,000 and over
18. Profits (before taxes) per dollar of sales, all manufacturing corporations
25. Change in manufacturers' unfilled orders, durable goods industries
30. Nonagricultural placements, all industries
55. Index of wholesale prices, all commodities other than farm products and foods
81. Index of consumer prices
82. Federal cash payments to the public
83. Federal cash receipts from the public
84. Federal cash surplus or deficit
90. Defense Department obligations, procurement
91. Defense Department obligations, total
92. Military prime contract awards to U.S. business firms
125. West Germany, index of industrial production
128. Japan, index of industrial production

Seasonal adjustments for these series were developed by either the Bureau of the Census or the NBER. The adjustment factors used are shown in the appendix table D. Seasonally adjusted data prepared by the collecting agency will be substituted for the series mentioned above whenever they are published.

### Designation of Business Cycle Turning Points

The historical business cycle turning points are those designated by the NBER. They mark the approximate date when aggregate economic activity reached its cyclical high or low levels. As a matter of general practice, a business cycle turning point will not be designated until at least 6 months after it has occurred.

### Charts

Time series line charts (charts 1-3) are used to show the cyclical timing and pattern of each series. Since various ratio and arithmetic scales are used, rates of change are not comparable except for those series having the same scale. See the diagram, page 4, for additional help in using the charts.

Shaded areas on the charts indicate periods of business cycle contraction between reference dates for peaks ("P"—beginnings of shaded areas) and troughs ("T"—ends of shaded areas). The shading

for a recession period will be entered only after a trough has been designated.

### Analytical Measures of Current Change

Four kinds of analytical measures are presented—rates of change, diffusion indexes, timing distributions, and direction-of-change tables. These measures aid in forming a judgment of the magnitude of current changes compared to previous changes, the imminence of a turning point in the business cycle, and the extent of current changes in different parts of the economy. They also point to developments in particular industries and places.

**Rates of change.**—There is considerable interest in the rate of acceleration during expansions and the rate of retardation during recessions. For this reason, rates of change for the principal monthly and quarterly business cycle series are included in table 2 of this report. Rates of change are helpful in judging and appraising trends of acceleration or retardation in a current business cycle phase, despite the fact that the erratic nature of month-to-month rates of change often makes it difficult to determine the significance of a change until some months after it has occurred. For series, such as unemployment and layoffs, which usually move down during expansions and up during recessions, the changes are inverted so that, in table 2, rises are shown as declines and declines as rises.

**Diffusion indexes.**—Diffusion indexes are simple summary measures of groups of economic series. They express, for a given group, the percent of the series which has risen over given intervals of time. Their turning points tend to lead the turning points of the aggregate and they measure how widespread a business change is. They vary between the limits of 100 (all components rising) and zero (all components falling). Widespread increases are often associated with rapid growth in aggregate activity, and widespread declines with sharp reductions.

The diffusion indexes in this report are grouped according to the timing classification of the NBER. For monthly series, two comparison intervals are used: 1-month intervals (January-February, February-March, etc.) and 3-month intervals (January-April, February-May, etc.). The indexes based on 1-month intervals are more "current" but they are also more irregular than the 3-month indexes (see chart 2). Quarterly series are compared over 1-quarter intervals and 4-quarter intervals.

Series numbers preceded by the letter "D" designate diffusion indexes. When one of these numbers corresponds to a basic indicator series number, it means that the diffusion index has been computed from components of the indicator series; for example, the diffusion index numbered "D6" is computed from components of series number 6. Diffusion indexes not computed from basic series components are assigned new numbers.

This report includes 29 diffusion indexes based on 16 indicator series (see tables 4 and 5). Seventeen of these indexes are computed by the Bureau of the Census utilizing nearly 300 components of 9 indicators (D1, D5, D6, D19, D23, D41, D47, D54,

and D58). Indexes for 8 of these indicators show comparisons for components over both 3-month and 1-month spans while, for 1 indicator (D58), comparisons are over 1-month spans only. The 12 other diffusion indexes are based on 7 indicators closely related to the above 9 indicators. They include two indexes on capital appropriations (602 companies and 15 industries)—NBER indexes based on data from the National Industrial Conference Board; the Chicago Purchasing Agents Association index based on monthly reports of changes in profits (200 companies); the First National City Bank of New York index based on quarterly profit reports (700 companies); and 8 NBER diffusion indexes—actual and anticipated—for the following: Manufacturers' sales (800 companies) and new orders (400 companies), based on data from Dun and Bradstreet, Inc.; car-loadings (19 commodity groups), based on data from the Association of American Railroads; and new plant and equipment expenditures (16 industries), based on data from the Office of Business Economics and the Securities and Exchange Commission.

Diffusion indexes that are based on anticipations show what proportion of business enterprises (or industries) are forecasting a rise in activity. Comparisons with indexes based on actual changes show whether there is a generally optimistic bias or a lag in recognition of actual developments.

Diffusion indexes constructed on the basis of current data are often highly irregular and require careful judgment in their use and interpretation.

**Timing distributions.**—Distributions of current "highs" appear to be helpful in appraising the evidence for a prospective business cycle turning point. Each month a timing distribution is constructed which shows the number of series reaching high values during each month of the expansion. The timing distribution is summarized by showing the number of series reaching new highs and the percent currently high for each of several recent months (see table 3). Similar distributions of "lows" will be prepared during contractions.

To provide historical perspective for interpreting the distribution of current highs, such distributions are also shown for leading and coincident series as they appear 3 months and 6 months before the peak of each of the earlier post-World War II expansions and at their peaks.

To compile timing distributions for the current cyclical phase, the data for the principal business cycle indicators are scanned each month. During a business cycle expansion, the high value for each series is recorded. (For inverted series, that is series with negative conformity to the business cycle, low values are taken during expansions and high values during contractions.) If the values for 2 or more months are equal, the latest date is taken as the high month. In selecting these values, erratic values are disregarded, although it is, of course, difficult to identify an erratic value, particularly for the current month.

The letter "H" is used in the basic data table (table 1) to identify and highlight the current high values during the expansion, and the letter "L" to

identify the low values preceding the current highs. The highs designated during the current cyclical phase will not necessarily be the specific cycle peaks. Thus, as new high levels are reached during the expansion, the current highs will be moved ahead. On the other hand, lows preceding current highs are usually specific cycle troughs. Comparisons of the current timing distributions with those for periods around earlier business cycle troughs and peaks are helpful for appraising the evidence of a prospective business cycle turning point.

Interpretations of timing distributions must be made in light of the fact that a contraction following a high value reached several months ago may be the result of an erratic fluctuation and that a new high may be reached in some future month. In short, when the percent currently high falls below 50 percent for both the leading and roughly coincident series, this does not necessarily signify that a business cycle peak has occurred. It may do so, but it may also simply reflect a short reversal in the upward movement.

**Direction-of-change tables.**—Direction-of-change tables show directions of change ("+" for rising, "o" for unchanged, and "-" for falling) in the components used for the diffusion indexes. These tables provide a convenient view of changing business conditions and are helpful in making an economic interpretation of the movements in the more highly aggregated statistical measures. That is, they show which economic activities went up, which went down, and how long such movements have persisted. They also help to show how a recession or recovery spreads from one sector of the economy to another.

### Comparisons of Cyclical Patterns

In forming a judgment about the current intensity and probable ultimate character of a cyclical fluctuation, some economists find it helpful to compare the behavior of the indicator series and diffusion indexes in the current business cycle phase with their behavior during the corresponding phase of previous business cycles. These comparisons are made in different ways depending upon the phase of the business cycle.

Contractions are compared by computing changes over the span from the most recent business cycle peak to the current month and over equal spans from previous reference peaks. This type of comparison is designated as representing changes from reference peak levels and from reference peak dates.

Expansions may be compared by measuring changes from the immediately preceding peak levels. In this report the current expansion is related to the May 1960 reference peak. For earlier expansions, percentage changes are also computed from their respective reference peaks to dates which are the same number of months beyond the succeeding reference troughs as the current expansion is beyond its reference trough. This type of comparison is designated as representing changes from reference peak levels and from reference trough dates. Although the spans from reference trough dates are the same for each expansion, the

## Descriptions and Procedures

spans from the preceding peak dates are different, depending on the length of the contractions. This type of comparison answers the question whether, and by how much, the current level of activity exceeds or falls short of the level at the preceding business cycle peak, a given number of months after the recovery began, and how the current situation compares in this respect with earlier recoveries.

Expansions also may be compared by computing changes from reference trough levels and from reference trough dates. This type of comparison measures the extent of the rise from the trough level so many months after the upswing began.

In addition to comparing cyclical fluctuations on the basis of reference dates (which are the same for all series), comparisons are made on the basis of specific peak and trough dates identified for each series. For example, the specific peak in retail sales corresponding to the May 1960 reference peak is April 1960; the specific peak in stock prices is July 1959.

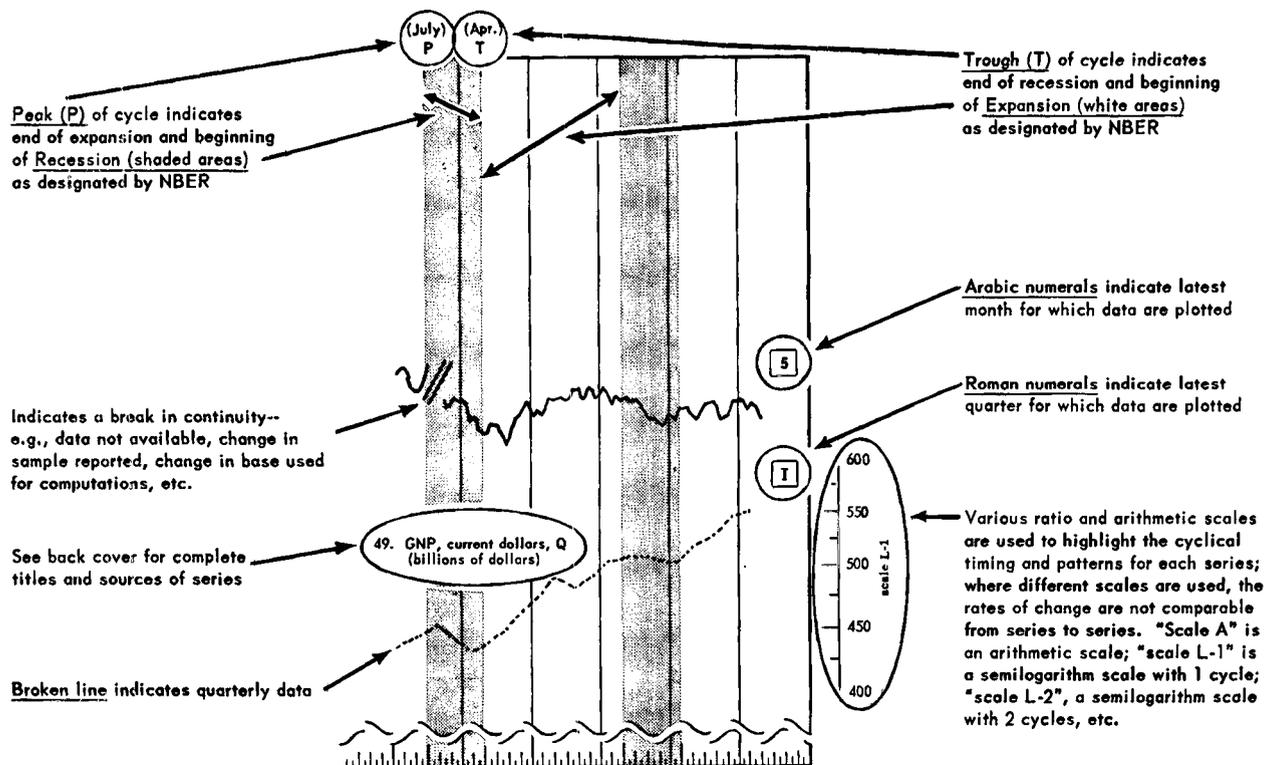
Recent performance in several individual indicators is compared graphically with that in earlier business cycles. In making graphic comparisons, the reference peak or trough levels are set equal to

100, and the reference peak or trough dates are aligned depending on the phase of the business cycle.

In order to make historical comparisons, it is frequently necessary to use data for a closely related series for cycles prior to the initial date covered by the series used currently. Such comparisons are, therefore, to be considered only approximate. Nearly all series have undergone change in definition, coverage, or estimation procedure since 1919. The principal cases of this sort are as follows:

7. New private nonfarm dwelling units started (prior to 1939: Residential building contracts, floor space)
41. Number of employees in nonagricultural establishments (prior to 1929: Employment in manufacturing)
52. Personal income (prior to 1929: Quarterly data as published by Barger and Klein)
54. Sales of retail stores (prior to 1935: Department store sales)
62. Index of wage and salary cost per unit of output, total manufacturing (prior to 1946: Production worker wage cost per unit. Supplements to wages and salaries, which are a part of total labor cost, are not included).

### HOW TO READ THE TIME SERIES CHARTS (CHARTS 1-3)



**IMPORTANT FEATURES AND CHANGES FOR THIS ISSUE**

A limited number of changes are made from time to time to reflect the change from one stage of the business cycle to another, to show new findings of business cycle research and newly available economic series, or to emphasize the activity of a particular series or series group. Such changes may involve additions or deletions of series used, changes in placement in relation to other series, changes in components of indexes, etc. These changes will be listed in this section each month. The changes made in this issue are as follows:

1. Series 17 and 62 have been recomputed to include revision of the component, Federal Reserve index of industrial production, and to bring seasonal adjustments up to date. In making the seasonal adjustments, the approach was to adjust ratios (rather than components), thus providing seasonal factors for these series (see appendix D). The Census Method II, X-9 technique was used.
2. The following series have been recomputed to the 1957-59=100 base:
  - Series 17.—Price per unit of labor cost index
  - Series 23.—Index of industrial materials prices
  - Series 47.—Index of industrial production
  - Series 62.—Index of wage and salary cost per unit of output, total manufacturing
  - Series 63.—Index of labor cost per unit of output, total GNP
3. Several specific peak and trough dates have been revised (see appendix B). Revisions affect series 9, 17, 41, 47, 52, 53, and 54.
4. The above revisions have resulted in changes in appendix C for series 17, 47, and 62; in appendix D for series 17 and 62; and in appendix F for series 47, 52, and 54. Appendix F has also been revised for series 49 and 50 to reflect earlier revisions.

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**BACKGROUND MATERIALS**

Experimental work for this report was carried out in collaboration with the National Bureau of Economic Research which is responsible for much of the early research in this field. The book, "Signals of Recession and Recovery," contains an explanation of research findings helpful in interpreting current cyclical trends, a more detailed description of the indicators and measures used, and additional historical data. This book was issued as Occasional Paper 77 of the National Bureau of Economic Research, 261 Madison Avenue, New York 16, N.Y. (207 pages, price \$3). Other references, both to historical studies and current interpretations of the indicators, appear in this book.

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# Business Cycle Developments

## INTRODUCTION

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The unique features are the arrangement of data according to their usual timing relations during the course of the business cycle and the inclusion of special analytical measures and historical cyclical comparisons that help in evaluating the current stage of the business cycle.

The chief merits of this report are the speed with which the data for indicators are collected, assembled, and published and the arrangement of the series for business cycle studies. Electronic computers are used for many of the computations, thus making early publication possible. Publication is scheduled for around the 20th of the month following the month of data.

About 70 principal indicators and over 300 components are used for the different measures shown. The movements of the series are shown against the background of the expansions and contractions of the general business cycle so that "leads" and "lags" can be readily detected and unusual cyclical developments spotted. The exact number of series included for the total and important classes of series may vary from month to month because of additions of new series and revisions in the composition of indexes. Almost all of the basic data are available in published reports. A complete list of the series and the sources of data is shown on the back cover of this report. All the data shown are seasonally adjusted where seasonal variations appear to exist.

## ORGANIZATION AND CONTENT OF THE REPORT

Three types of data are shown in this report. They are as follows:

**Basic data** (chart 1 and table 1).—Over 50 business cycle indicators and 20 additional series with business cycle significance are included. Together they provide a broad view of current and prospective business cycle fluctuations in the economy as well as the basis for making an economic interpretation of these fluctuations.

**Analytical measures** (charts 2-3 and tables 2-6).—These are measures which aid in forming a judgment of (1) the magnitude of current changes compared to previous changes, (2) the imminence of a turning point in the business cycle, and (3) the extent of current changes in different parts of the economy. They also aid in pointing to developments in particular industries and places.

**Cyclical patterns** (charts 4-5 and tables 7-9).—The current cyclical change is compared with changes at corresponding stages of earlier cycles. These comparisons are made in different ways depending upon the phase of the business cycle.

In addition to the data shown as part of the regular report, certain appendix materials are presented. These materials include historical data, key information, and adjustment factors.

## DESCRIPTIONS AND PROCEDURES

### Business Cycle Series

The three major groups of series are those with a fairly consistent timing relation to the business cycle. They are grouped, in accordance with the NBER classification, as "leading," "roughly coincident," or "lagging" indicators. Additional series are also included for a more complete coverage of the national economy. The series are described as follows:

**NBER Leading Indicators**.—Around 30 series usually reach peaks or troughs before those in aggregate economic activity as measured by the roughly coincident series (see below). For this reason, they are designated as "leading" series. One group of these series pertains to activities in the labor market, another to orders and contracts, and so on.

**NBER Roughly Coincident Indicators**.—About 15 series are direct measures of aggregate economic activity or move roughly together with it; for example, nonagricultural employment, industrial production or retail sales. For this reason they are referred to as "roughly coincident" series.

**NBER Lagging Indicators**.—Some series, such as new plant and equipment expenditures and manufacturers' inventories, usually have reached turning points after they were reached in aggregate economic activity, and for this reason, they are designated as "lagging" series.

**Other series**.—About 20 additional U.S. series with business cycle significance are also shown. Some of these series, such as change in money supply, merchandise trade balance, and cash surplus or deficit, represent important factors in the economy, but they have not qualified as indicators for various reasons, such as irregularity in timing. Finally, industrial production indexes for several countries which have important trade relations with the United States are presented.

## Descriptions and Procedures

### Seasonal Adjustments

Official seasonally adjusted data are used in this report wherever they are available. However, for the special purposes of business cycle studies, a number of series that are not ordinarily published in seasonally adjusted form are shown on a seasonally adjusted basis in this report. These series are as follows:

4. Number of persons on temporary layoff, all industries
5. Average weekly claims for unemployment insurance, State programs
9. Construction contracts awarded for commercial and industrial buildings, floor space
13. Number of new business incorporations
14. Current liabilities of business failures
15. Number of business failures with liabilities of \$100,000 and over
17. Price per unit of labor cost index
18. Profits (before taxes) per dollar of sales, all manufacturing corporations
25. Change in manufacturers' unfilled orders, durable goods industries
30. Nonagricultural placements, all industries
55. Index of wholesale prices, all commodities other than farm products and foods
62. Index of wage and salary cost per unit of output, total manufacturing
81. Index to consumer prices
82. Federal cash payments to the public
83. Federal cash receipts from the public
84. Federal cash surplus or deficit
90. Defense Department obligations, procurement
91. Defense Department obligations, total
92. Military prime contract awards to U.S. business firms
128. Japan, index of industrial production

Seasonal adjustments for these series were developed by either the Bureau of the Census or the NBER. The adjustment factors used are shown in the appendix table D. Seasonally adjusted data prepared by the collecting agency will be substituted for the series mentioned above whenever they are published.

### Designation of Business Cycle Turning Points

The historical business cycle turning points are those designated by the NBER. They mark the approximate date when aggregate economic activity reached its cyclical high or low levels. As a matter of general practice, a business cycle turning point will not be designated until at least 6 months after it has occurred.

### Charts

Time series line charts (charts 1-3) are used to show the cyclical timing and pattern of each series. Since various ratio and arithmetic scales are used, rates of change are not comparable except for those series having the same scale. See the diagram, page 4, for additional help in using the charts.

Shaded areas on the charts indicate periods of business cycle contraction between reference dates for peaks ("P"—beginnings of shaded areas) and troughs ("T"—ends of shaded areas). The shading

for a recession period will be entered only after a trough has been designated.

### Analytical Measures of Current Change

Four kinds of analytical measures are presented—rates of change, diffusion indexes, timing distributions, and direction-of-change tables. These measures aid in forming a judgment of the magnitude of current changes compared to previous changes, the imminence of a turning point in the business cycle, and the extent of current changes in different parts of the economy. They also point to developments in particular industries and places.

Rates of change.—There is considerable interest in the rate of acceleration during expansions and the rate of retardation during recessions. For this reason, rates of change for the principal monthly and quarterly business cycle series are included in table 2 of this report. Rates of change are helpful in judging and appraising trends of acceleration or retardation in a current business cycle phase, despite the fact that the erratic nature of month-to-month rates of change often makes it difficult to determine the significance of a change until some months after it has occurred. For series, such as unemployment and layoffs, which usually move down during expansions and up during recessions, the changes are inverted so that, in table 2, rises are shown as declines and declines as rises.

Diffusion indexes.—Diffusion indexes are simple summary measures of groups of economic series. They express, for a given group, the percent of the series which has risen over given intervals of time. Their turning points tend to lead the turning points of the aggregate and they measure how widespread a business change is. They vary between the limits of 100 (all components rising) and zero (all components falling). Widespread increases are often associated with rapid growth in aggregate activity, and widespread declines with sharp reductions.

The diffusion indexes in this report are grouped according to the timing classification of the NBER. For monthly series, two comparison intervals are used: 1-month intervals (January-February, February-March, etc.) and 3-month intervals (January-April, February-May, etc.). The indexes based on 1-month intervals are more "current" but they are also more irregular than the 3-month indexes (see chart 2). Quarterly series are compared over 1-quarter intervals and 4-quarter intervals.

Series numbers preceded by the letter "D" designate diffusion indexes. When one of these numbers corresponds to a basic indicator series number, it means that the diffusion index has been computed from components of the indicator series; for example, the diffusion index numbered "D6" is computed from components of series number 6. Diffusion indexes not computed from basic series components are assigned new numbers.

This report includes 29 diffusion indexes based on 16 indicator series (see tables 4 and 5). Seventeen of these indexes are computed by the Bureau of the Census utilizing nearly 300 components of 9 indicators (D1, D5, D6, D19, D23, D41, D47, D54,

and D58). Indexes for 8 of these indicators show comparisons for components over both 3-month and 1-month spans while, for 1 indicator (D58), comparisons are over 1-month spans only. The 12 other diffusion indexes are based on 7 indicators closely related to the above 9 indicators. They include two indexes on capital appropriations (602 companies and 15 industries)—NBER indexes based on data from the National Industrial Conference Board; the Chicago Purchasing Agents Association index based on monthly reports of changes in profits (200 companies); the First National City Bank of New York index based on quarterly profit reports (700 companies); and 8 NBER diffusion indexes—actual and anticipated—for the following: Manufacturers' sales (800 companies) and new orders (400 companies), based on data from Dun and Bradstreet, Inc.; carloadings (19 commodity groups), based on data from the Association of American Railroads; and new plant and equipment expenditures (16 industries), based on data from the Office of Business Economics and the Securities and Exchange Commission.

Diffusion indexes that are based on anticipations show what proportion of business enterprises (or industries) are forecasting a rise in activity. Comparisons with indexes based on actual changes show whether there is a generally optimistic bias or a lag in recognition of actual developments.

Diffusion indexes constructed on the basis of current data are often highly irregular and require careful judgment in their use and interpretation.

**Timing distributions.**—Distributions of current "highs" appear to be helpful in appraising the evidence for a prospective business cycle turning point. Each month a timing distribution is constructed which shows the number of series reaching high values during each month of the expansion. The timing distribution is summarized by showing the number of series reaching new highs and the percent currently high for each of several recent months (see table 3). Similar distributions of "lows" will be prepared during contractions.

To provide historical perspective for interpreting the distribution of current highs, such distributions are also shown for leading and coincident series as they appear 3 months and 6 months before the peak of each of the earlier post-World War II expansions and at their peaks.

To compile timing distributions for the current cyclical phase, the data for the principal business cycle indicators are scanned each month. During a business cycle expansion, the high value for each series is recorded. (For inverted series, that is series with negative conformity to the business cycle, low values are taken during expansions and high values during contractions.) If the values for 2 or more months are equal, the latest date is taken as the high month. In selecting these values, erratic values are disregarded, although it is, of course, difficult to identify an erratic value, particularly for the current month.

The letter "H" is used in the basic data table (table 1) to identify and highlight the current high values during the expansion, and the letter "L" to

identify the low values preceding the current highs. The highs designated during the current cyclical phase will not necessarily be the specific cycle peaks. Thus, as new high levels are reached during the expansion, the current highs will be moved ahead. On the other hand, lows preceding current highs are usually specific cycle troughs. Comparisons of the current timing distributions with those for periods around earlier business cycle troughs and peaks are helpful for appraising the evidence of a prospective business cycle turning point.

Interpretations of timing distributions must be made in light of the fact that a contraction following a high value reached several months ago may be the result of an erratic fluctuation and that a new high may be reached in some future month. In short, when the percent currently high falls below 50 percent for both the leading and roughly coincident series, this does not necessarily signify that a business cycle peak has occurred. It may do so, but it may also simply reflect a short reversal in the upward movement.

**Direction-of-change tables.**—Direction-of-change tables show directions of change ("+" for rising, "o" for unchanged, and "-" for falling) in the components used for the diffusion indexes. These tables provide a convenient view of changing business conditions and are helpful in making an economic interpretation of the movements in the more highly aggregated statistical measures. That is, they show which economic activities went up, which went down, and how long such movements have persisted. They also help to show how a recession or recovery spreads from one sector of the economy to another.

#### Comparisons of Cyclical Patterns

In forming a judgment about the current intensity and probable ultimate character of a cyclical fluctuation, some economists find it helpful to compare the behavior of the indicator series and diffusion indexes in the current business cycle phase with their behavior during the corresponding phase of previous business cycles. These comparisons are made in different ways depending upon the phase of the business cycle.

Contractions are compared by computing changes over the span from the most recent business cycle peak to the current month and over equal spans from previous reference peaks. This type of comparison is designated as representing changes from reference peak levels and from reference peak dates.

Expansions may be compared by measuring changes from the immediately preceding peak levels. In this report the current expansion is related to the May 1960 reference peak. For earlier expansions, percentage changes are also computed from their respective reference peaks to dates which are the same number of months beyond the succeeding reference troughs as the current expansion is beyond its reference trough. This type of comparison is designated as representing changes computed from reference peak levels and from reference trough dates. Although the spans from reference trough dates are the same for each expansion, the

Descriptions and Procedures

spans from the preceding peak dates are different, depending on the length of the contractions. This type of comparison answers the question whether, and by how much, the current level of activity exceeds or falls short of the level at the preceding business cycle peak, a given number of months after the recovery began, and how the current situation compares in this respect with earlier recoveries.

Expansions also may be compared by computing changes from reference trough levels and from reference trough dates. This type of comparison measures the extent of the rise from the trough level so many months after the upswing began.

In addition to comparing cyclical fluctuations on the basis of reference dates (which are the same for all series), comparisons are made on the basis of specific peak and trough dates identified for each series. For example, the specific peak in retail sales corresponding to the May 1960 reference peak is April 1960; the specific peak in stock prices is July 1959.

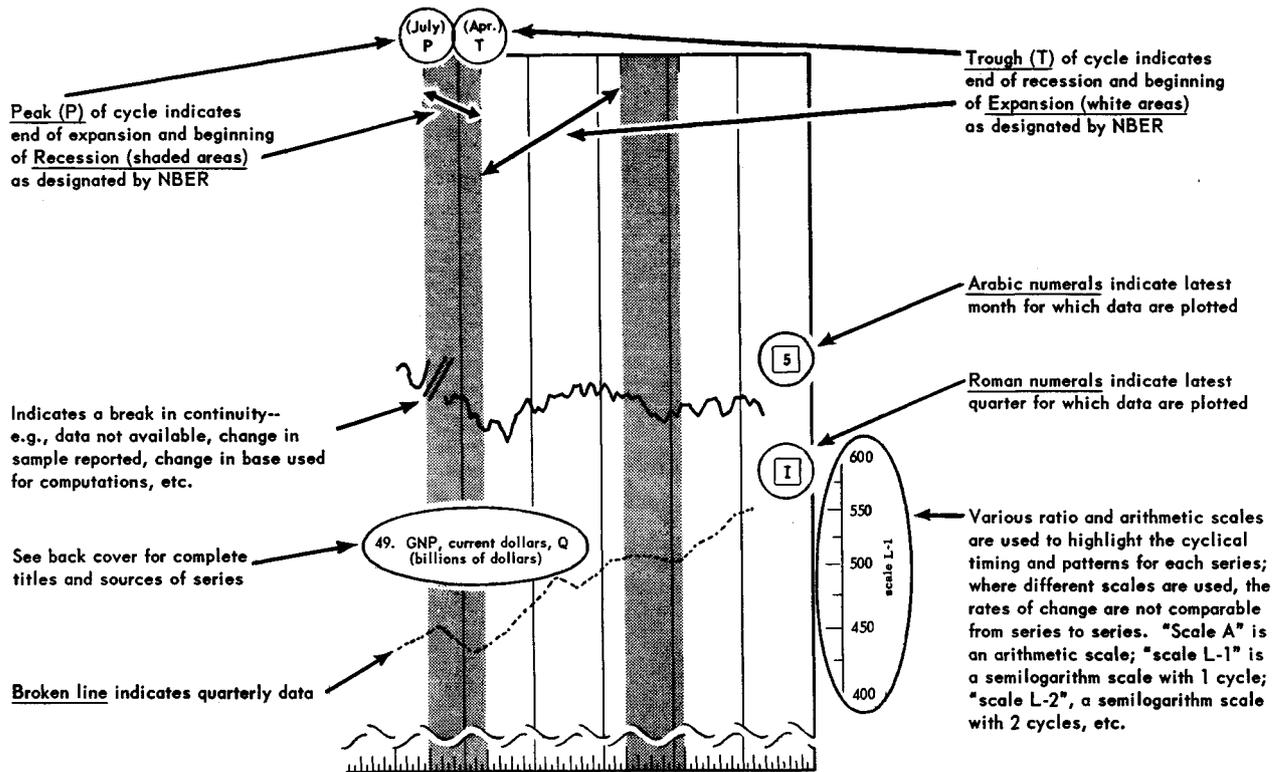
Recent performance in several individual indicators is compared graphically with that in earlier business cycles. In making graphic comparisons, the reference peak or trough levels are set equal to

100, and the reference peak or trough dates are aligned depending on the phase of the business cycle.

In order to make historical comparisons, it is frequently necessary to use data for a closely related series for cycles prior to the initial date covered by the series used currently. Such comparisons are, therefore, to be considered only approximate. Nearly all series have undergone change in definition, coverage, or estimation procedure since 1919. The principal cases of this sort are as follows:

- 7. New private nonfarm dwelling units started (prior to 1939: Residential building contracts, floor space)
- 41. Number of employees in nonagricultural establishments (prior to 1929: Employment in manufacturing)
- 52. Personal income (prior to 1929: Quarterly data as published by Barger and Klein)
- 54. Sales of retail stores (prior to 1935: Department store sales)
- 62. Index of wage and salary cost per unit of output, total manufacturing (prior to 1946: Production worker wage cost per unit. Supplements to wages and salaries, which are a part of total labor cost, are not included).

HOW TO READ THE TIME SERIES CHARTS (CHARTS 1-3)



**IMPORTANT FEATURES AND CHANGES FOR THIS ISSUE**

A limited number of changes are made from time to time to reflect the change from one stage of the business cycle to another, to show new findings of business cycle research and newly available economic series, or to emphasize the activity of a particular series or series group. Such changes may involve additions or deletions of series used, changes in placement in relation to other series, changes in components of indexes, etc. These changes will be listed in this section each month. The changes made in this issue are as follows:

1. The following three new series have been added to the report:
  - 96. Manufacturers' unfilled orders, durable goods industries
  - 97. Backlog of capital appropriations, manufacturing
  - 98. Percent change in total U.S. money supply (demand deposits and currency) and commercial bank time deposits

They are included in the group, "Other U.S. Series with Business Cycle Significance."

2. All the series showing international comparisons (series 121 to 128) have been recomputed to a 1957-59 = 100 index.

3. A new seasonal adjustment has been made for series 11, Newly approved capital appropriations. Component industries are seasonally adjusted and then added to obtain the seasonally adjusted total. The source for the new seasonal factors is the National Bureau of Economic Research.

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**BACKGROUND MATERIALS**

Experimental work for this report was carried out in collaboration with the National Bureau of Economic Research which is responsible for much of the early research in this field. The book, "Signals of Recession and Recovery," contains an explanation of research findings helpful in interpreting current cyclical trends, a more detailed description of the indicators and measures used, and additional historical data. This book was issued as Occasional Paper 77 of the National Bureau of Economic Research, 261 Madison Avenue, New York 16, N.Y. (207 pages, price \$3). Other references, both to historical studies and current interpretations of the indicators, appear in this book.

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Consumer installment debt (series 66) has been revised back to July 1955 by the source agency to allow for a new seasonal adjustment and the adjustment of two components to the June 1960 benchmark.

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# Business Cycle Developments

## INTRODUCTION

This report has been prepared to bring together many of the available economic indicators in convenient form for analysis and interpretation by specialists in business cycle analysis. The presentation and classification of series in this report follows the business indicators approach. The classification of series and the business cycle turning dates are those designated by the National Bureau of Economic Research (NBER) which, in recent years, has been the leader in this field of investigation. However, this publication is not to be taken as implying acceptance or endorsement by the Bureau of the Census or any other government agency of any particular approach to business cycle analysis. It is intended only to supplement other reports of the Department of Commerce that provide data for analyzing current business conditions.

The unique features are the arrangement of data according to their usual timing relations during the course of the business cycle and the inclusion of special analytical measures and historical cyclical comparisons that help in evaluating the current stage of the business cycle.

The chief merits of this report are the speed with which the data for indicators are collected, assembled, and published and the arrangement of the series for business cycle studies. Electronic computers are used for many of the computations, thus making early publication possible. Publication is scheduled for around the 20th of the month following the month of data.

About 70 principal indicators and over 300 components are used for the different measures shown. The movements of the series are shown against the background of the expansions and contractions of the general business cycle so that "leads" and "lags" can be readily detected and unusual cyclical developments spotted. The exact number of series included for the total and important classes of series may vary from month to month because of additions of new series and revisions in the composition of indexes. Almost all of the basic data are available in published reports. A complete list of the series and the sources of data is shown on the back cover of this report. All the data shown are seasonally adjusted where seasonal variations appear to exist.

## ORGANIZATION AND CONTENT OF THE REPORT

Three types of data are shown in this report. They are as follows:

**Basic data** (chart 1 and table 1).—Over 50 business cycle indicators and 20 additional series with business cycle significance are included. Together they provide a broad view of current and prospective business cycle fluctuations in the economy as well as the basis for making an economic interpretation of these fluctuations.

**Analytical measures** (charts 2-3 and tables 2-6).—These are measures which aid in forming a judgment of (1) the magnitude of current changes compared to previous changes, (2) the imminence of a turning point in the business cycle, and (3) the extent of current changes in different parts of the economy. They also aid in pointing to developments in particular industries and places.

**Cyclical patterns** (charts 4-5 and tables 7-9).—The current cyclical change is compared with changes at corresponding stages of earlier cycles. These comparisons are made in different ways depending upon the phase of the business cycle.

In addition to the data shown as part of the regular report, certain appendix materials are presented. These materials include historical data, key information, and adjustment factors.

## DESCRIPTIONS AND PROCEDURES

### Business Cycle Series

The three major groups of series are those with a fairly consistent timing relation to the business cycle. They are grouped, in accordance with the NBER classification, as "leading," "roughly coincident," or "lagging" indicators. Additional series are also included for a more complete coverage of the national economy. The series are described as follows:

**NBER Leading Indicators**.—Around 30 series usually reach peaks or troughs before those in aggregate economic activity as measured by the roughly coincident series (see below). For this reason, they are designated as "leading" series. One group of these series pertains to activities in the labor market, another to orders and contracts, and so on.

**NBER Roughly Coincident Indicators**.—About 15 series are direct measures of aggregate economic activity or move roughly together with it; for example, nonagricultural employment, industrial production and retail sales. For this reason they are referred to as "roughly coincident" series.

**NBER Lagging Indicators**.—Some series, such as new plant and equipment expenditures and manufacturers' inventories, usually have reached turning points after they were reached in aggregate economic activity, and for this reason, they are designated as "lagging" series.

**Other series**.—About 20 additional U.S. series with business cycle significance are also shown. Some of these series, such as change in money supply, merchandise trade balance, and cash surplus or deficit, represent important factors in the economy, but they have not qualified as indicators for various reasons, such as irregularity in timing. Finally, industrial production indexes for several countries which have important trade relations with the United States are presented.

### Seasonal Adjustments

Official seasonally adjusted data are used in this report wherever they are available. However, for the special purposes of business cycle studies, a number of series that are not ordinarily published in seasonally adjusted form are shown on a seasonally adjusted basis in this report. These series are as follows:

4. Number of persons on temporary layoff, all industries
5. Average weekly initial claims for unemployment insurance, State programs
9. Construction contracts awarded for commercial and industrial buildings, floor space
13. Number of new business incorporations
14. Current liabilities of business failures
15. Number of business failures with liabilities of \$100,000 and over
17. Price per unit of labor cost index
18. Profits (before taxes) per dollar of sales, all manufacturing corporations
25. Change in manufacturers' unfilled orders, durable goods industries
30. Nonagricultural placements, all industries
55. Index of wholesale prices, all commodities other than farm products and foods
62. Index of wage and salary cost per unit of output, total manufacturing
81. Index of consumer prices
82. Federal cash payments to the public
83. Federal cash receipts from the public
84. Federal cash surplus or deficit
90. Defense Department obligations, procurement
91. Defense Department obligations, total
92. Military prime contract awards to U.S. business firms
96. Manufacturers' unfilled orders, durable goods industries
97. Backlog of capital appropriations, manufacturing
128. Japan, index of industrial production

Seasonal adjustments for these series were developed by either the Bureau of the Census or the NBER. The adjustment factors used are shown in the appendix table D. Seasonally adjusted data prepared by the collecting agency will be substituted for the series mentioned above whenever they are published.

### Designation of Business Cycle Turning Points

The historical business cycle turning points are those designated by the NBER. They mark the approximate date when aggregate economic activity reached its cyclical high or low levels. As a matter of general practice, a business cycle turning point will not be designated until at least 6 months after it has occurred.

### Charts

Time series line charts (charts 1-3) are used to show the cyclical timing and pattern of each series. Since various ratio and arithmetic scales are used, rates of change are not comparable except for those series having the same scale. See the diagram, page 4, for additional help in using the charts.

Shaded areas on the charts indicate periods of business cycle contraction between reference dates

for peaks ("P"—beginnings of shaded areas) and troughs ("T"—ends of shaded areas). The shading for a recession period will be entered only after a trough has been designated.

### Analytical Measures of Current Change

Four kinds of analytical measures are presented—rates of change, diffusion indexes, timing distributions, and direction-of-change tables. These measures aid in forming a judgment of the magnitude of current changes compared to previous changes, the imminence of a turning point in the business cycle, and the extent of current changes in different parts of the economy. They also point to developments in particular industries and places.

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This report includes 29 diffusion indexes based on 16 indicator series (see tables 4 and 5). Seventeen of these indexes are computed by the Bureau of the Census utilizing nearly 300 components of 9 indicators (D1, D5, D6, D19, D23, D41, D47, D54,

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**Timing distributions.**—Distributions of current "highs" appear to be helpful in appraising the evidence for a prospective business cycle turning point. Each month a timing distribution is constructed which shows the number of series reaching high values during each month of the expansion. The timing distribution is summarized by showing the number of series reaching new highs and the percent currently high for each of several recent months (see table 3). Similar distributions of "lows" will be prepared during contractions.

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## Descriptions and Procedures

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Recent performance in several individual indicators is compared graphically with that in earlier business cycles. In making graphic comparisons, the reference peak or trough levels are set equal to

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### HOW TO READ THE TIME SERIES CHARTS (CHARTS 1-3)

