

DESCRIPTIONS AND PROCEDURES

INTRODUCTION

Students of economic conditions describe the business cycle as consisting of alternating periods of expansion and contraction in production, employment, income, money flows, prices, and other economic processes. The fluctuations take place in a concerted manner, but not simultaneously. Once an expansion gets underway, it spreads from firm to firm, from industry to industry, from area to area, and from process to process, cumulating until a cyclical peak in aggregate activity is reached. Even while expansion is widespread during the upward phase of the business cycle, some activities continue to move in the opposite direction. Declines begin to spread as the expansion nears its peak and continue to spread even faster after the peak has been passed. But some activities continue to expand during the general contraction. Before long these expansions become stronger and more widespread. When they begin to dominate the situation, the upturn in aggregate activity has arrived and a new expansion is underway. This sequence is recurrent, but not periodic.

The causal relations among these various economic processes are primarily responsible for the cumulative nature of cyclical forces, and explain why expansion eventually turns into recession and recession into expansion. Cyclical fluctuations in production and employment are preceded by fluctuations in measures which relate to future rather than to current production—measures such as new orders for durable goods, the formation of new business enterprises, and accessions to payrolls. They are followed by fluctuations in various types of economic costs, such as labor costs, interest rates, fulfillment of commitments that take a long time to consummate, and holdings of inventories and of debts.

Intensive research by the National Bureau of Economic Research (NBER) over many years has provided a list of those significant series that usually lead, those that usually move with, and those that usually lag behind cyclical movements in aggregate economic ac-

tivity. The series have been grouped and classified by the NBER as “leading”, “roughly coincident”, or “lagging” indicators. These indicators are defined as follows:

NBER Leading Indicators.—Series that usually reach peaks or troughs before those in aggregate economic activity as measured by the roughly coincident series (see below). One group of these series pertains to activities in the labor market, another to orders and contracts, and so on.

NBER Roughly Coincident Indicators.—Series that are direct measures of aggregate economic activity or move roughly together with it; for example, nonagricultural employment, industrial production, and retail sales.

NBER Lagging Indicators.—Series, such as new plant and equipment expenditures and manufacturers' inventories, that usually reach turning points after they are reached in aggregate economic activity.

Other U.S. series with business cycle significance are included in this report. 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 for a broad picture of international economy.

METHOD OF PRESENTATION

Data are shown in this report in three general categories, as follows:

Basic Data (chart 1 and tables 1 and 2).—Data are shown for business cycle indicators, additional

U.S. series with business cycle significance, and industrial production indexes for selected countries. 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 (chart 2 and tables 3 to 5).—These are measures that aid in forming a judgment of the imminence of a turning point in the business cycle, determining the extent of current changes in different parts of the economy, and pointing to developments in particular industries and places.

Cyclical Patterns (chart 3 and tables 6 to 8).—Current cyclical levels are compared with levels 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.

DESIGNATION OF BUSINESS CYCLE TURNING POINTS

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

Monthly business cycle peaks and troughs have been dated by the NBER for the period 1854-1961. Over this span, expansion has prevailed 61 percent of the time and contraction, 39 percent. If war periods are disregarded, expansion has prevailed 56 percent of the time and contraction, 44 percent.

SEASONAL AND RELATED STATISTICAL ADJUSTMENTS

Official seasonally adjusted data are used in this report, if 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. Seasonal adjustments for these series were developed by either the NBER or the Bureau of the Census using Census Method II. The adjustment factors are shown in

appendix D, except for those series which are the sums of seasonally adjusted components, and those series which are based on unpublished source data. Seasonally adjusted data prepared by the source agency will be substituted whenever they are published.

Adjustments, for changes in average climatic conditions and institutional arrangements during the year are also made by Census Method II. In addition, series such as new building permits are adjusted for variations in the number of trading or working days and series such as retail sales of apparel are adjusted for variable holidays (for example, Easter).

Studies of the effect of unusual weather upon some series have also been started. It is important to note, however, that present methods adjust for *average* weather conditions and not for the *dispersion* about this average; that is, present methods are designed to adjust for normal but not abnormal weather at any time of the year. For this reason, many seasonally adjusted series, such as housing starts, will tend to be low in months when the weather is unusually bad and high in months when the weather is unusually good. While it eventually may be possible, Census methods do not at present make any adjustments for such variations.

MCD MOVING AVERAGES

MCD (months for cyclical dominance) is an estimate of the appropriate span over which to observe the cyclical movements in a monthly series. This span is usually longer than a single month because month-to-month changes are often dominated by erratic movements, but shorter than the frequently used 12-month span (change from the same month a year ago), and is different for different series (see appendix C for MCD values and method of computation).

MCD is, on average, the first span of months for which the average change for the cyclical factor is greater than that of the irregular factor and remains so. It is small for smooth series and large for irregular series. The differences between moving averages of the period equal to MCD are commensurate with the differences between seasonally adjusted values separated by the same MCD span; thus, the month-to-month differences in a 3-month moving average are commensurate with differences in seasonally adjusted values over 3-month spans. MCD moving averages all have about the same degree of smoothness. Consequently, MCD moving averages of highly irregular series, such as business failures and Federal cash payments, will show their cyclical movements about as clearly as the seasonally adjusted data for such smooth series as industrial production and personal income.

MCD moving averages are shown in chart 1 for all series with an MCD of "5" or more. To provide an indication of the variation about these moving averages, seasonally adjusted data are also plotted beginning with 1958. Although not so smooth as more powerful moving averages (such as the weighted 15-term Spencer curve), the MCD curve is more current and has a smaller rounding bias around business cycle peaks and troughs. On balance, the MCD curve seems to offer a reasonable compromise in terms of currency, smoothness, and fidelity to the patterns of business cycle fluctuations.

Because of advance reporting and preliminary seasonal factors, the MCD's for current data are usually larger than those computed from historical series and shown in appendix C. MCD is usually computed for a fairly long period, one covering both expansions and contractions. Since the pace of change varies from phase to phase of the business cycle, such a measure will not provide an accurate estimate of the span over which to estimate cyclically significant changes at all times. Thus, MCD computed for the period 1953-63 is likely to be too high during the early stages of recovery when expansion has usually been rapid and too low during the late stages of expansion when the rate of advance has usually been small. This limitation should be borne in mind when making use of this measure.¹

ANALYTICAL MEASURES OF CURRENT CHANGE

Three kinds of analytical measures are presented—timing distributions, diffusion indexes, and directions of change. These measures aid in forming a judgment of the 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.

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. This timing distribution shows the number of series reaching new highs and the percent currently high for each of several recent months (see table

¹For a more complete description of MCD and its use in studying economic series, see *Business Cycle Indicators*, Geoffrey H. Moore, editor; National Bureau of Economic Research, Inc., vol. 1, ch. 18, "Statistics for Short-Term Economic Forecasting," by Julius Shiskin (Princeton University Press: 1961).

3). Similar distributions of "lows" will be presented 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 date of the high value for each series is recorded. (For inverted series—that is, series with negative conformity to the business cycle—dates of low values are taken.) 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 may be disregarded, although it is, of course, difficult to identify an erratic value, particularly for the current month.

The letter "H" is used in table 2 to identify and highlight the current high values during the expansion. The highs designated during the current cyclical phase will not necessarily be the specific cycle peaks. (See appendix B.) As new high levels are reached during the expansion, the current highs will be moved ahead. Comparisons of the current timing distributions with those for periods around earlier business cycle 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 simply reflect a short reversal in the upward movement.

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 spans 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, comparisons are made over 1-month spans (January-February, February-March, etc.) and generally for either 6- or 9-month spans, depending upon the irregularity of the series. The indexes based on 1-month spans are more "current" but they are also more irregular than the 6- or 9-month indexes. (See chart 2.) Quarterly series are compared over 1-quarter spans, 3-quarter spans, and 4-quarter spans.

Recent research has shown that the longer-span diffusion indexes are not only smoother, but have systematically larger amplitudes than the 1-month indexes. The 1-month indexes generally have large irregular fluctuations, but the movements may be significant when important changes are taking place, particularly around cyclical turning points. Since the longer-span diffusion indexes are centered, there is an apparent loss in currency equal to one-half the span; for example, 3 months in the case of a 6-month diffusion index. However, the most recent figure for a 6-month or longer-span index does provide the latest available information on changes *over that span*. If a significant reversal has taken place *within that span*, the 1-month indexes are likely to reveal it. Presentation of both 1-month and longer-span diffusion indexes provides an opportunity for the user to take advantage of the best features of each in interpreting current changes.

Series numbers preceded by the letter "D" designate diffusion indexes. When one of these numbers corresponds to the number of a basic indicator series, 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 6. Diffusion indexes not computed from basic series components are assigned new numbers.

Diffusion indexes that are based on business expectations 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.

Direction-of-Change Table

The direction-of-change table (table 5) shows directions of change ("+" for rising, "o" for unchanged,

and "-" for falling) in the components used for the diffusion indexes. This table provides a convenient view of changing business conditions and is helpful in making an economic interpretation of the movements in the more highly aggregated statistical measures. That is, it shows which economic activities went up, which went down, and how long such movements have persisted. The table also helps to show how a recession or recovery spreads from one sector of the economy to another.

Directions of change for most diffusion index components are shown for consecutive months and, depending upon the irregularity of the series, for either 6- or 9-month spans.

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 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 whether the current cyclical phase is an expansion or contraction.

Expansions are compared in one way by measuring changes from the immediately preceding peak levels. In table 6 of this report, data for the latest month in the current expansion (shown by number of months from the February 1961 trough) are compared with the May 1960 reference peak. For each earlier expansion, data for a like period (same number of months from the trough of its expansion) are compared with its preceding reference peak. This type of comparison is designated as changes computed *from reference peak levels and from reference trough dates*. This type of comparison shows whether, and by how much, the current level of activity exceeds or falls short of the level at the preceding business cycle peak, and how the current situation compares, in this respect, with earlier expansions. For those earlier periods of expansion that were shorter than the current one, the comparisons reflect the status at a point after a new contraction had set in.

Expansions are also compared by computing changes *from reference trough levels and from reference trough dates* (table 7). For the current expansion, this type of comparison measures the extent of the rise from the trough level (February 1961) to the level at the current month. For each earlier expansion,

sion, data for a like period (same number of months from the trough of its expansion) are compared with the level at its trough. The same situation exists here as for the comparisons shown in table 6: For earlier expansions that were shorter than the current one, the comparisons show the status at a point after a new contraction had set in.

Contractions can be 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 changes *from reference peak levels and from reference peak dates*. These comparisons will be made during a contraction period.

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 for the index of industrial production is January 1960 (corresponding to the May 1960 reference peak); the specific peak for stock prices is July 1959. (See appendix B.) Specific cycle comparisons are shown in table 8. For earlier expansions, these comparisons differ from those shown for reference cycles in that they show only the period up to the next specific peak date and do not include any part of the contraction that followed. For some series, therefore, the earlier comparisons cover fewer months than those for the current expansion.

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 labor cost per unit of output, total manufacturing (prior to 1946: Production worker wage cost per unit).

CHARTS

Two types of charts are used to highlight the cyclical patterns of the business cycle indicators: Historical time series and cyclical comparisons.

Historical Time Series (charts 1 and 2)

These charts show cyclical fluctuations against the background of expansions and contractions in general business activity from 1948 to the current month. Shaded areas on the charts indicate periods of business cycle contractions between business cycle peak dates (beginnings of shaded areas) and business cycle trough dates (ends of shaded areas). The shading for a new contraction will be entered only after a trough has been designated.

Several different ratio and arithmetic scales are used to highlight the cyclical movements of the various series. The scale selected for each series is identified in the margin of the chart. Rates of change of various series can be compared with each other only where scales are identical. See the diagram, page 6, for additional help in using these charts.

Cyclical Comparisons (chart 3)

This chart compares the performance of selected indicators during the current expansion with their performance during the expansion phase of previous business cycles. The usual date sequence followed in charts is disregarded, and instead the data are alined at the strategic point of the business cycle: For expansions, the reference trough (see part A) and specific trough (see part B). Thus, these comparisons facilitate judgments on the vigor of the current expansion relative to cyclical movements during the expansions of previous cycles.

Two types of cyclical comparisons are made. Part A compares the pattern of the current *reference cycle* (the cycle for aggregate economic activity) with movements over the corresponding phases of previous reference cycles. Part B compares the pattern of the current *specific cycle* (the cycle for a particular series) with the movements over the corresponding phases of previous specific cycles in that series. In both parts, the trough dates are alined. In part A, the levels of the preceding peaks are also alined while in part B, the levels of the preceding troughs are alined. See the section, "Comparisons of Cyclical Patterns", for more detailed descriptions of these comparisons.

HOW TO READ CHARTS 1 AND 2

Solid line indicates monthly data. (Data may be actual monthly figures or MCD moving averages.*)

Parallel lines indicate a break in continuity (e.g., data not available, change in series definition, etc.).

See **back cover** for complete titles and sources of series.

Broken line indicates actual monthly data for series where an MCD moving average * is plotted.

Solid line with plotting points indicates quarterly data.

* Many of the more irregular series are shown in terms of their MCD moving averages as well as their actual monthly data. In such cases, the 4-, 5-, or 6-term moving averages are plotted 1½, 2, or 2½ months, respectively, behind the actual data. See page 2 for a description of MCD moving averages.



Arabic number indicates latest month for which data are plotted. ("5"=May)

Roman number indicates latest quarter for which data are plotted. ("III"=third quarter)

Dotted line indicates anticipated data.

Various scales are used to highlight the patterns of the individual series. Series plotted to different scales are not directly comparable. "Scale A" is an arithmetic scale, "scale L-1" is a logarithmic scale with 1 cycle in a given distance, "scale L-2" is a logarithmic scale with 2 cycles in that distance, etc.

Solid line indicates monthly diffusion index data for 6- or 9-month intervals.

Broken line indicates monthly diffusion index data for 1-month intervals.

Solid line with plotting points indicates quarterly diffusion index data for various intervals.



Scale shows percent of diffusion index components rising.

Arabic number indicates latest month for which data are used in computing the diffusion indexes. ("6"=June)

Roman number indicates latest quarter for which data are used in computing the diffusion indexes. ("II"=second quarter)

Broken line with plotting points indicates quarterly diffusion index data for various intervals. This line is also used to indicate anticipated quarterly diffusion index data.

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Series numbers preceded by the letter "D" designate diffusion indexes. When one of these numbers corresponds to the number of a basic indicator series, 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 6. Diffusion indexes not computed from basic series components are assigned new numbers.

Diffusion indexes that are based on business expectations 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.

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The direction-of-change table (table 5) shows directions of change ("+" for rising, "o" for unchanged,

and "--" for falling) in the components used for the diffusion indexes. This table provides a convenient view of changing business conditions and is helpful in making an economic interpretation of the movements in the more highly aggregated statistical measures. That is, it shows which economic activities went up, which went down, and how long such movements have persisted. The table also helps to show how a recession or recovery spreads from one sector of the economy to another.

Directions of change for most diffusion index components are shown for consecutive months and, depending upon the irregularity of the series, for either 6- or 9-month spans.

COMPARISONS OF CYCICAL 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 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 whether the current cyclical phase is an expansion or contraction.

Expansions are compared in one way by measuring changes from the immediately preceding peak levels. In table 6 of this report, data for the latest month in the current expansion (shown by number of months from the February 1961 trough) are compared with the May 1960 reference peak. For each earlier expansion, data for a like period (same number of months from the trough of the expansion) are compared with the preceding reference peak. This type of comparison is designated as changes computed *from reference peak levels and from reference trough dates*. This type of comparison shows whether, and by how much, the current level of activity exceeds or falls short of the level at the preceding business cycle peak, and how the current situation compares, in this respect, with earlier expansions. For those earlier periods of expansion that were shorter than the current one, the comparisons reflect the status at a point after a new contraction had set in.

Expansions are also compared by computing changes *from reference trough levels and from reference trough dates* (table 7). For the current expansion, this type of comparison measures the extent of the rise from the trough level (February 1961) to the level at the current month. For each earlier expansion,

sion, data for a like period (same number of months from the trough of the expansion) are compared with the level at the trough. The same situation exists here as for the comparisons shown in table 6: For earlier expansions that were shorter than the current one, the comparisons show the status at a point after a new contraction had set in.

Contractions can be 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 changes *from reference peak levels and from reference peak dates*. These comparisons will be made during a contraction period.

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 for the index of industrial production is January 1960 (corresponding to the May 1960 reference peak); the specific peak for stock prices is July 1959. (See appendix B.) Specific cycle comparisons are shown in table 8. For earlier expansions, these comparisons differ from those shown for reference cycles in that they show only the period up to the next specific peak date and do not include any part of the contraction that followed. For some series, therefore, the earlier comparisons cover fewer months than those for the current expansion.

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 labor cost per unit of output, total manufacturing (prior to 1946: Production worker wage cost per unit).

CHARTS

Two types of charts are used to highlight the cyclical patterns of the business cycle indicators: Historical time series and cyclical comparisons.

Historical Time Series (charts 1 and 2)

These charts show cyclical fluctuations against the background of expansions and contractions in general business activity from 1948 to the current month. Shaded areas on the charts indicate periods of business cycle contractions between business cycle peak dates (beginnings of shaded areas) and business cycle trough dates (ends of shaded areas). The shading for a new contraction will be entered only after a trough has been designated.

Several different ratio and arithmetic scales are used to highlight the cyclical movements of the various series. The scale selected for each series is identified in the margin of the chart. Rates of change of various series can be compared with each other only where scales are identical. See the diagram, page 6, for additional help in using these charts.

Cyclical Comparisons (chart 3)

This chart compares the performance of selected indicators during the current expansion with their performance during the expansion phase of previous business cycles. The usual date sequence followed in charts is disregarded, and instead the data are alined at the strategic point of the business cycle: For expansions, the reference trough (see part A) and specific trough (see part B). Thus, these comparisons facilitate judgments on the vigor of the current expansion relative to cyclical movements during the expansions of previous cycles.

Two types of cyclical comparisons are made. Part A compares the pattern of the current *reference cycle* (the cycle for aggregate economic activity) with movements over the corresponding phases of previous reference cycles. Part B compares the pattern of the current *specific cycle* (the cycle for a particular series) with the movements over the corresponding phases of previous specific cycles in that series. In both parts, the trough dates are alined. In part A, the levels of the preceding peaks are also alined while in Part B, the levels of the troughs are alined. See the section, "Comparisons of Cyclical Patterns", for more detailed descriptions of these comparisons.

CHART 1 — Business Cycle Series

Peak (P) of cycle indicates end of expansion and beginning of Recession (shaded areas) as designated by NBER.

Trough (T) of cycle indicates end of recession and beginning of Expansion (white areas) as designated by NBER.

See **back cover** for complete titles and sources of series.

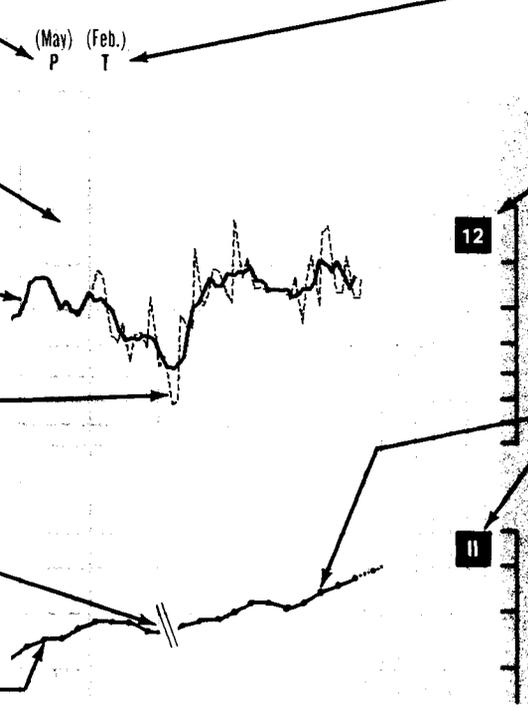
Solid line indicates monthly data. (Data may be actual monthly figures or MCD moving averages.*)

Broken line indicates actual monthly data for series where an MCD moving average* is plotted.

Parallel lines indicate a break in continuity (data not available, changes in series definitions, etc.).

Solid line with plotting points indicates quarterly data.

* Many of the more irregular series are shown in terms of their MCD moving averages as well as their actual monthly data. In such cases, the 4-, 5-, or 6-term moving averages are plotted 1½, 2, or 2½ months, respectively, behind the actual data. See page 2 for a description of MCD moving averages.



Arabic number indicates latest month for which data are plotted. ("12" = December)

Roman number indicates latest quarter for which data are plotted. ("II" = second quarter)

Dotted line indicates anticipated data.

Various scales are used to highlight the patterns of the individual series. Series plotted to different scales are not directly comparable. "Scale A" is an arithmetic scale, "scale L-1" is a logarithmic scale with 1 cycle in a given distance, "scale L-2" is a logarithmic scale with 2 cycles in that distance, etc.

CHART 2 — Diffusion Indexes

Solid line indicates monthly data over 6- or 9-month spans.

Broken line indicates monthly data over 1-month spans.

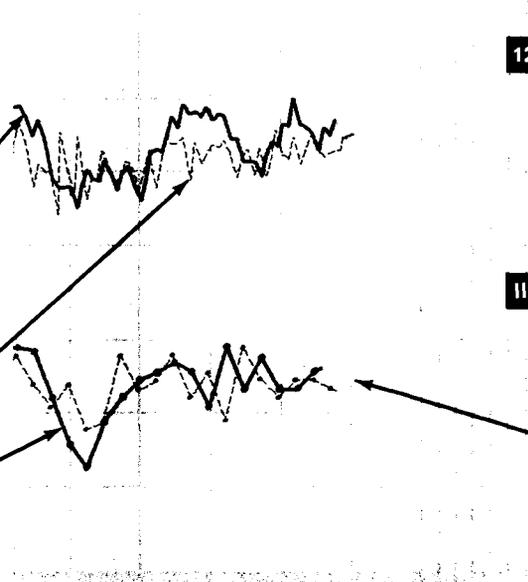
Solid line with plotting points indicates quarterly data over various spans.

Scale shows percent of components rising.

Arabic number indicates latest month for which data are used in computing the indexes. ("12" = December)

Roman number indicates latest quarter for which data are used in computing the indexes. ("III" = third quarter)

Broken line with plotting points indicates quarterly data over various intervals. This line is also used to indicate anticipated quarterly data.



DESCRIPTIONS AND PROCEDURES

INTRODUCTION

Students of economic conditions describe the business cycle as consisting of alternating periods of expansion and contraction in production, employment, income, money flows, prices, and other economic processes. The fluctuations take place in a concerted manner, but not simultaneously. Once an expansion gets underway, it spreads from firm to firm, from industry to industry, from area to area, and from process to process, cumulating until a cyclical peak in aggregate activity is reached. Even while expansion is widespread during the upward phase of the business cycle, some activities continue to move in the opposite direction. Declines begin to spread as the expansion nears its peak and continue to spread even faster after the peak has been passed. But some activities continue to expand during the general contraction. Before long these expansions become stronger and more widespread. When they begin to dominate the situation, the upturn in aggregate activity has arrived and a new expansion is underway. This sequence is recurrent, but not periodic.

The causal relations among these various economic processes are primarily responsible for the cumulative nature of cyclical forces, and explain why expansion eventually turns into recession and recession into expansion. Cyclical fluctuations in production and employment are preceded by fluctuations in measures which relate to future rather than to current production—measures such as new orders for durable goods, the formation of new business enterprises, and accessions to payrolls. They are followed by fluctuations in various types of economic costs, such as labor costs, interest rates, fulfillment of commitments that take a long time to consummate, and holdings of inventories and of debts.

Intensive research by the National Bureau of Economic Research (NBER) over many years has provided a list of those significant series that usually lead, those that usually move with, and those that usually lag behind cyclical movements in aggregate economic ac-

tivity. The series have been grouped and classified by the NBER as "leading", "roughly coincident", or "lagging" indicators. These indicators are defined as follows:

- ▷ *NBER Leading Indicators*.—Series that usually reach peaks or troughs before those in aggregate economic activity as measured by the roughly coincident series (see below). One group of these series pertains to activities in the labor market, another to orders and contracts, and so on.
- ▷ *NBER Roughly Coincident Indicators*.—Series that are direct measures of aggregate economic activity or move roughly together with it; for example, nonagricultural employment, industrial production, and retail sales.
- ▷ *NBER Lagging Indicators*.—Series, such as new plant and equipment expenditures and manufacturers' inventories, that usually reach turning points after they are reached in aggregate economic activity.

Other U.S. series with business cycle significance are included in this report. 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.

METHOD OF PRESENTATION

Data are shown in this report in three general categories, as follows:

- ▷ *Basic Data* (chart 1 and tables 1 and 2).—Data are shown for business cycle indicators, additional

U.S. series with business cycle significance, and industrial production indexes for selected countries. 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* (chart 2 and tables 3 to 5).— These are measures that aid in forming a judgment of the imminence of a turning point in the business cycle, determining the extent of current changes in different parts of the economy, and pointing to developments in particular industries and places.
- ▶ *Cyclical Patterns* (chart 3 and tables 6 to 8).— Current cyclical levels are compared with levels 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.

DESIGNATION OF BUSINESS CYCLE TURNING POINTS

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

Monthly business cycle peaks and troughs have been dated by the NBER for the period 1854-1961. Over this span, expansion has prevailed 61 percent of the time and contraction, 39 percent. If war periods are disregarded, expansion has prevailed 56 percent of the time and contraction, 44 percent.

SEASONAL AND RELATED STATISTICAL ADJUSTMENTS

Official seasonally adjusted data are used in this report, if 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. Seasonal adjustments for these series were developed by either the NBER or the Bureau of the Census using Census Method II. The adjustment factors are shown in

appendix D, except for those series which are the sums of seasonally adjusted components, and those series which are based on unpublished source data. Seasonally adjusted data prepared by the source agency will be substituted whenever they are published.

Adjustments for changes in average climatic conditions and institutional arrangements during the year are also made by Census Method II. In addition, series such as new building permits are adjusted for variations in the number of trading or working days and series such as retail sales of apparel are adjusted for variable holidays (for example, Easter).

Studies of the effect of unusual weather upon some series have also been started. It is important to note, however, that present methods adjust for *average* weather conditions and not for the *dispersion* about this average; that is, present methods are designed to adjust for normal, but not abnormal weather at any time of the year. For this reason, many seasonally adjusted series, such as housing starts, will tend to be low in months when the weather is unusually bad and high in months when the weather is unusually good. While it eventually may be possible, Census methods do not at present make any adjustments for such variations.

MCD MOVING AVERAGES

MCD (months for cyclical dominance) is an estimate of the appropriate span over which to observe the cyclical movements in a monthly series. This span is usually longer than a single month because month-to-month changes are often dominated by erratic movements, but shorter than the frequently used 12-month span (change from the same month a year ago), and is different for different series (see appendix C for MCD values and method of computation).

MCD is, on average, the first span of months for which the average change for the cyclical factor is greater than that of the irregular factor and remains so. It is small for smooth series and large for irregular series. The differences between moving averages of the period equal to MCD are commensurate with the differences between seasonally adjusted values separated by the same MCD span; thus, the month-to-month differences in a 3-month moving average are commensurate with differences in seasonally adjusted values over 3-month spans. MCD moving averages all have about the same degree of smoothness. Consequently, MCD moving averages of highly irregular series, such as business failures and Federal cash payments, will show their cyclical movements about as clearly as the seasonally adjusted data for such smooth series as industrial production and personal income.

MCD moving averages are shown in chart 1 for all series with an MCD of "5" or more. To provide an indication of the variation about these moving averages, seasonally adjusted data are also plotted beginning with 1958. Although not so smooth as more powerful moving averages (such as the weighted 15-term Spencer curve), the MCD curve is more current and has a smaller rounding bias around business cycle peaks and troughs. On balance, the MCD curve seems to offer a reasonable compromise in terms of currency, smoothness, and fidelity to the patterns of business cycle fluctuations.

Because of advance reporting and preliminary seasonal factors, the MCD's for current data are usually larger than those computed from historical series and shown in appendix C. MCD is usually computed for a fairly long period, one covering both expansions and contractions. Since the pace of change varies from phase to phase of the business cycle, such a measure will not provide an accurate estimate of the span over which to estimate cyclically significant changes at all times. Thus, MCD computed for the period 1953-63 is likely to be too high during the early stages of recovery when expansion has usually been rapid and too low during the late stages of expansion when the rate of advance has usually been small. This limitation should be borne in mind when making use of this measure.¹

ANALYTICAL MEASURES OF CURRENT CHANGE

Three kinds of analytical measures are presented—timing distributions, diffusion indexes, and directions of change. These measures aid in forming a judgment of the 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.

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. This timing distribution shows 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 presented 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 leading and roughly coincident business cycle indicators are scanned each month. During a business cycle expansion, the date of the high value for each series is recorded. (For inverted series—that is, series with negative conformity to the business cycle—dates of low values are taken.) 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 may be disregarded, although it is, of course, difficult to identify an erratic value, particularly for the current month.

The letter "H" is used in table 2 to identify and highlight the current high values during the expansion. The highs designated during the current cyclical phase will not necessarily be the specific cycle peaks. (See appendix B.) As new high levels are reached during the expansion, the current highs will be moved ahead. Comparisons of the current timing distributions with those for periods around earlier business cycle 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 simply reflect a short reversal in the upward movement.

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 spans 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

¹For a more complete description of MCD and its use in studying economic series, see *Business Cycle Indicators*, Geoffrey H. Moore, editor; National Bureau of Economic Research, Inc., vol. 1, ch. 18, "Statistics for Short-Term Economic Forecasting," by Julius Shiskin (Princeton University Press: 1961).

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, comparisons are made over 1-month spans (January-February, February-March, etc.) and generally for either 6- or 9-month spans, depending upon the irregularity of the series. The indexes based on 1-month spans are more "current" but they are also more irregular than the 6- or 9-month indexes. (See chart 2.) Quarterly series are compared over 1-quarter spans, 3-quarter spans, and 4-quarter spans.

Recent research has shown that the longer-span diffusion indexes are not only smoother, but have systematically larger amplitudes than the 1-month indexes. The 1-month indexes generally have large irregular fluctuations, but the movements may be significant when important changes are taking place, particularly around cyclical turning points. Since the longer-span diffusion indexes are centered, there is an apparent loss in currency equal to one-half the span; for example, 3 months in the case of a 6-month diffusion index. However, the most recent figure for a 6-month or longer-span index does provide the latest available information on changes *over that span*. If a significant reversal has taken place *within that span*, the 1-month indexes are likely to reveal it. Presentation of both 1-month and longer-span diffusion indexes provides an opportunity for the user to take advantage of the best features of each in interpreting current changes.

Series numbers preceded by the letter "D" designate diffusion indexes. When one of these numbers corresponds to the number of a basic indicator series, 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 6. Diffusion indexes not computed from basic series components are assigned new numbers.

Diffusion indexes that are based on business expectations 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.

Direction-of-Change Table

The direction-of-change table (table 5) shows directions of change ("+" for rising, "o" for unchanged,

and "-" for falling) in the components used for the diffusion indexes. This table provides a convenient view of changing business conditions and is helpful in making an economic interpretation of the movements in the more highly aggregated statistical measures. That is, it shows which economic activities went up, which went down, and how long such movements have persisted. The table also helps to show how a recession or recovery spreads from one sector of the economy to another.

Directions of change for most diffusion index components are shown for consecutive months and, depending upon the irregularity of the series, for either 6- or 9-month spans.

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 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 whether the current cyclical phase is an expansion or contraction.

Expansions are compared in one way by measuring changes from the immediately preceding peak levels. In table 6 of this report, data for the latest month in the current expansion (shown by number of months from the February 1961 trough) are compared with the May 1960 reference peak. For each earlier expansion, data for a like period (same number of months from the trough of the expansion) are compared with the preceding reference peak. This type of comparison is designated as changes computed *from reference peak levels and from reference trough dates*. This type of comparison shows whether, and by how much, the current level of activity exceeds or falls short of the level at the preceding business cycle peak, and how the current situation compares, in this respect, with earlier expansions. For those earlier periods of expansion that were shorter than the current one, the comparisons reflect the status at a point after a new contraction had set in.

Expansions are also compared by computing changes *from reference trough levels and from reference trough dates* (table 7). For the current expansion, this type of comparison measures the extent of the rise from the trough level (February 1961) to the level at the current month. For each earlier expansion

sion, data for a like period (same number of months from the trough of the expansion) are compared with the level at the trough. The same situation exists here as for the comparisons shown in table 6: For earlier expansions that were shorter than the current one, the comparisons show the status at a point after a new contraction had set in.

Contractions can be 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 changes *from reference peak levels and from reference peak dates*. These comparisons will be made during a contraction period.

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 for the index of industrial production is January 1960 (corresponding to the May 1960 reference peak); the specific peak for stock prices is July 1959. (See appendix B.) Specific cycle comparisons are shown in table 8. For earlier expansions, these comparisons differ from those shown for reference cycles in that they show only the period up to the next specific peak date and do not include any part of the contraction that followed. For some series, therefore, the earlier comparisons cover fewer months than those for the current expansion.

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)
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CHARTS

Two types of charts are used to highlight the cyclical patterns of the business cycle indicators: Historical time series and cyclical comparisons.

Historical Time Series (charts 1 and 2)

These charts show cyclical fluctuations against the background of expansions and contractions in general business activity from 1948 to the current month. Shaded areas on the charts indicate periods of business cycle contractions between business cycle peak dates (beginnings of shaded areas) and business cycle trough dates (ends of shaded areas). The shading for a new contraction will be entered only after a trough has been designated.

Several different ratio and arithmetic scales are used to highlight the cyclical movements of the various series. The scale selected for each series is identified in the margin of the chart. Rates of change of various series can be compared with each other only where scales are identical. See the diagram, page 6, for additional help in using these charts.

Cyclical Comparisons (charts 3 and 4)

These charts compare the performance of selected indicators during the current expansion with their performance during the expansion phase of previous business cycles. The usual date sequence followed in charts is disregarded, and instead the data are alined at the strategic point of the business cycle: For expansions, the reference trough (see chart 3) and specific trough (see chart 4). Thus, these comparisons facilitate judgments on the vigor of the current expansion relative to cyclical movements during the expansions of previous cycles.

Two types of cyclical comparisons are made. Chart 3 compares the pattern of the current *reference cycle* (the cycle for aggregate economic activity) with movements over the corresponding phases of previous reference cycles. Chart 4 compares the pattern of the current *specific cycle* (the cycle for a particular series) with the movements over the corresponding phases of previous specific cycles in that series. In both charts, the trough dates are alined. In chart 3, the levels of the preceding peaks are also alined while in chart 4, the levels of the troughs are alined. See the section, "Comparisons of Cyclical Patterns", for more detailed descriptions of these comparisons.

HOW TO READ CHARTS 1 AND 2

Peak (P) of cycle indicates end of expansion and beginning of Recession (shaded areas) as designated by NBER.

CHART 1 – Business Cycle Series

Trough (T) of cycle indicates end of recession and beginning of Expansion (white areas) as designated by NBER.

See back cover for complete titles and sources of series.

Arabic number indicates latest month for which data are plotted. ("12" = December)

Solid line indicates monthly data. (Data may be actual monthly figures or MCD moving averages.*)

Roman number indicates latest quarter for which data are plotted. ("II" = second quarter)

Broken line indicates actual monthly data for series where an MCD moving average* is plotted.

Dotted line indicates anticipated data.

Parallel lines indicate a break in continuity (data not available, changes in series definitions, etc.).

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Solid line with plotting points indicates quarterly data.

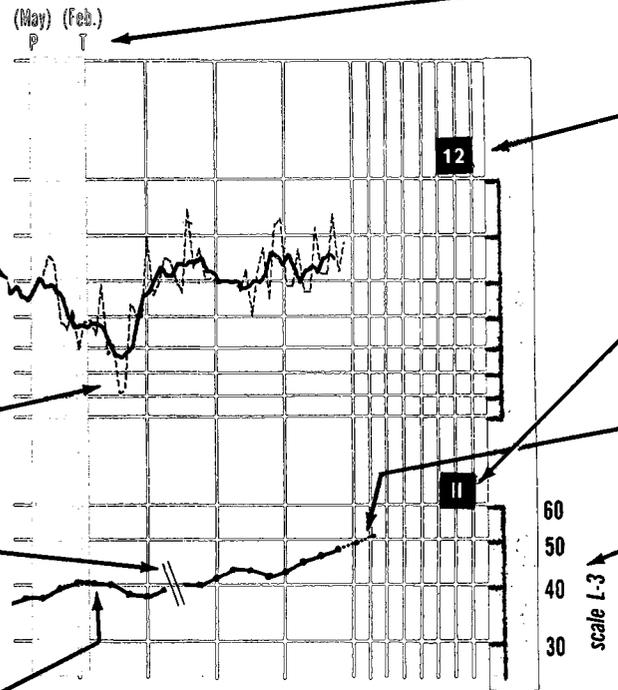


CHART 2 – Diffusion Indexes

Solid line indicates monthly data over 6- or 9-month spans.

Scale shows percent of components rising.

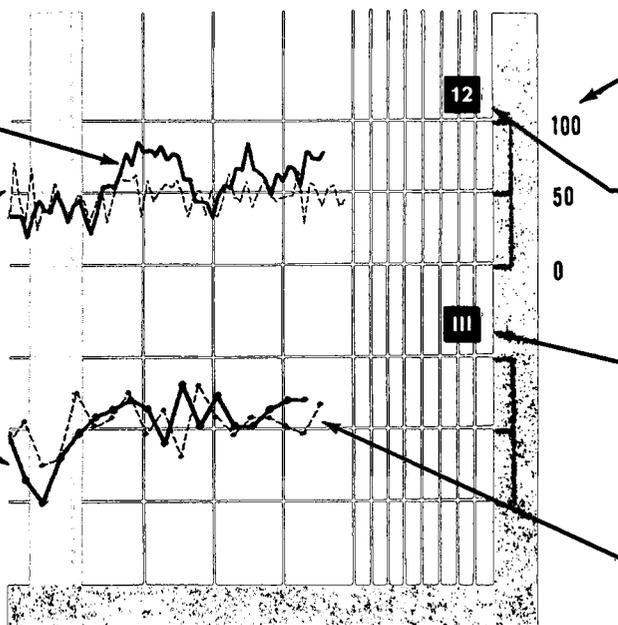
Broken line indicates monthly data over 1-month spans.

Arabic number indicates latest month for which data are used in computing the indexes. ("12" = December)

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* Many of the more irregular series are shown in terms of their MCD moving averages as well as their actual monthly data. In such cases, the 4-, 5-, or 6-term moving averages are plotted 1½, 2, or 2½ months, respectively, behind the actual data. See page 2 for a description of MCD moving averages.



Broken line with plotting points indicates quarterly data over various intervals. This line is also used to indicate anticipated quarterly data.

DESCRIPTIONS AND PROCEDURES

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NBER Roughly Coincident Indicators.—Series that are direct measures of aggregate economic activity or move roughly together with it; for example, nonagricultural employment, industrial production, and retail sales.

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- ✦ *Analytical Measures* (chart 2 and tables 3 to 5).— These are measures that aid in forming a judgment of the imminence of a turning point in the business cycle, determining the extent of current changes in different parts of the economy, and pointing to developments in particular industries and places.
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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.

DESIGNATION OF BUSINESS CYCLE TURNING POINTS

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

Monthly business cycle peaks and troughs have been dated by the NBER for the period 1854-1961. Over this span, expansion has prevailed 61 percent of the time and contraction, 39 percent. If war periods are disregarded, expansion has prevailed 56 percent of the time and contraction, 44 percent.

SEASONAL AND RELATED STATISTICAL ADJUSTMENTS

Official seasonally adjusted data are used in this report, if 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. Seasonal adjustments for these series were developed by either the NBER or the Bureau of the Census using Census Method II. The adjustment factors are shown in

appendix D, except for those series which are the sums of seasonally adjusted components, and those series which are based on unpublished source data. Seasonally adjusted data prepared by the source agency will be substituted whenever they are published.

Adjustments for changes in average climatic conditions and institutional arrangements during the year are also made by Census Method II. In addition, series such as new building permits are adjusted for variations in the number of trading or working days and series such as retail sales of apparel are adjusted for variable holidays (for example, Easter).

Studies of the effect of unusual weather upon some series have also been started. It is important to note, however, that present methods adjust for *average* weather conditions and not for the *dispersion* about this average; that is, present methods are designed to adjust for normal, but not abnormal weather at any time of the year. For this reason, many seasonally adjusted series, such as housing starts, will tend to be low in months when the weather is unusually bad and high in months when the weather is unusually good. While it eventually may be possible, Census methods do not at present make any adjustments for such variations.

MCD MOVING AVERAGES

MCD (months for cyclical dominance) is an estimate of the appropriate span over which to observe the cyclical movements in a monthly series. This span is usually longer than a single month because month-to-month changes are often dominated by erratic movements, but shorter than the frequently used 12-month span (change from the same month a year ago), and is different for different series (see appendix C for MCD values and method of computation).

MCD is, on average, the first span of months for which the average change for the cyclical factor is greater than that of the irregular factor and remains so. It is small for smooth series and large for irregular series. The differences between moving averages of the period equal to MCD are commensurate with the differences between seasonally adjusted values separated by the same MCD span; thus, the month-to-month differences in a 3-month moving average are commensurate with differences in seasonally adjusted values over 3-month spans. MCD moving averages all have about the same degree of smoothness. Consequently, MCD moving averages of highly irregular series, such as business failures and Federal cash payments, will show their cyclical movements about as clearly as the seasonally adjusted data for such smooth series as industrial production and personal income.

MCD moving averages are shown in chart 1 for all series with an MCD of "5" or more. To provide an indication of the variation about these moving averages, seasonally adjusted data are also plotted beginning with 1958. Although not so smooth as more powerful moving averages (such as the weighted 15-term Spencer curve), the MCD curve is more current and has a smaller rounding bias around business cycle peaks and troughs. On balance, the MCD curve seems to offer a reasonable compromise in terms of currency, smoothness, and fidelity to the patterns of business cycle fluctuations.

Because of advance reporting and preliminary seasonal factors, the MCD's for current data are usually larger than those computed from historical series and shown in appendix C. MCD is usually computed for a fairly long period, one covering both expansions and contractions. Since the pace of change varies from phase to phase of the business cycle, such a measure will not provide an accurate estimate of the span over which to estimate cyclically significant changes at all times. Thus, MCD computed for the period 1953-63 is likely to be too high during the early stages of recovery when expansion has usually been rapid and too low during the late stages of expansion when the rate of advance has usually been small. This limitation should be borne in mind when making use of this measure.¹

ANALYTICAL MEASURES OF CURRENT CHANGE

Three kinds of analytical measures are presented—timing distributions, diffusion indexes, and directions of change. These measures aid in forming a judgment of the 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.

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. This timing distribution shows the number of series reaching new highs and the percent currently high for each of several recent months (see table

¹For a more complete description of MCD and its use in studying economic series, see *Business Cycle Indicators*, Geoffrey H. Moore, editor; National Bureau of Economic Research, Inc., vol. 1, ch. 18, "Statistics for Short-Term Economic Forecasting," by Julius Shiskin (Princeton University Press: 1961).

3). Similar distributions of "lows" will be presented 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 leading and roughly coincident business cycle indicators are scanned each month. During a business cycle expansion, the date of the high value for each series is recorded. (For inverted series—that is, series with negative conformity to the business cycle—dates of low values are taken.) 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 may be disregarded, although it is, of course, difficult to identify an erratic value, particularly for the current month.

The letter "H" is used in table 2 to identify and highlight the current high values during the expansion. The highs designated during the current cyclical phase will not necessarily be the specific cycle peaks. (See appendix B.) As new high levels are reached during the expansion, the current highs will be moved ahead. Comparisons of the current timing distributions with those for periods around earlier business cycle 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 simply reflect a short reversal in the upward movement.

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 spans 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, comparisons are made over 1-month spans (January-February, February-March, etc.) and generally for either 6- or 9-month spans, depending upon the irregularity of the series. The indexes based on 1-month spans are more "current" but they are also more irregular than the 6- or 9-month indexes. (See chart 2.) Quarterly series are compared over 1-quarter spans, 3-quarter spans, and 4-quarter spans.

Recent research has shown that the longer-span diffusion indexes are not only smoother, but have systematically larger amplitudes than the 1-month indexes. The 1-month indexes generally have large irregular fluctuations, but the movements may be significant when important changes are taking place, particularly around cyclical turning points. Since the longer-span diffusion indexes are centered, there is an apparent loss in currency equal to one-half the span; for example, 3 months in the case of a 6-month diffusion index. However, the most recent figure for a 6-month or longer-span index does provide the latest available information on changes *over that span*. If a significant reversal has taken place *within that span*, the 1-month indexes are likely to reveal it. Presentation of both 1-month and longer-span diffusion indexes provides an opportunity for the user to take advantage of the best features of each in interpreting current changes.

Series numbers preceded by the letter "D" designate diffusion indexes. When one of these numbers corresponds to the number of a basic indicator series, 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 6. Diffusion indexes not computed from basic series components are assigned new numbers.

Diffusion indexes that are based on business expectations 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.

Direction-of-Change Table

The direction-of-change table (table 5) shows directions of change ("+" for rising, "o" for unchanged,

and "-" for falling) in the components used for the diffusion indexes. This table provides a convenient view of changing business conditions and is helpful in making an economic interpretation of the movements in the more highly aggregated statistical measures. That is, it shows which economic activities went up, which went down, and how long such movements have persisted. The table also helps to show how a recession or recovery spreads from one sector of the economy to another.

Directions of change for most diffusion index components are shown for consecutive months and, depending upon the irregularity of the series, for either 6- or 9-month spans.

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 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 whether the current cyclical phase is an expansion or contraction.

Expansions are compared in one way by measuring changes from the immediately preceding peak levels. In table 6 of this report, data for the latest month in the current expansion (shown by number of months from the February 1961 trough) are compared with the May 1960 reference peak. For each earlier expansion, data for a like period (same number of months from the trough of the expansion) are compared with the preceding reference peak. This type of comparison is designated as changes computed *from reference peak levels and from reference trough dates*. This type of comparison shows whether, and by how much, the current level of activity exceeds or falls short of the level at the preceding business cycle peak, and how the current situation compares, in this respect, with earlier expansions. For those earlier periods of expansion that were shorter than the current one, the comparisons reflect the status at a point after a new contraction had set in.

Expansions are also compared by computing changes *from reference trough levels and from reference trough dates* (table 7). For the current expansion, this type of comparison measures the extent of the rise from the trough level (February 1961) to the level at the current month. For each earlier expansion,

sion, data for a like period (same number of months from the trough of the expansion) are compared with the level at the trough. The same situation exists here as for the comparisons shown in table 6: For earlier expansions that were shorter than the current one, the comparisons show the status at a point after a new contraction had set in.

Contractions can be 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 changes *from reference peak levels and from reference peak dates*. These comparisons will be made during a contraction period.

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 for the index of industrial production is January 1960 (corresponding to the May 1960 reference peak); the specific peak for stock prices is July 1959. (See appendix B.) Specific cycle comparisons are shown in table 8. For earlier expansions, these comparisons differ from those shown for reference cycles in that they show only the period up to the next specific peak date and do not include any part of the contraction that followed. For some series, therefore, the earlier comparisons cover fewer months than those for the current expansion.

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 labor cost per unit of output, total manufacturing (prior to 1946: Production worker wage cost per unit).

CHARTS

Two types of charts are used to highlight the cyclical patterns of the business cycle indicators: Historical time series and cyclical comparisons.

Historical Time Series (charts 1 and 2)

These charts show cyclical fluctuations against the background of expansions and contractions in general business activity from 1948 to the current month. Shaded areas on the charts indicate periods of business cycle contractions between business cycle peak dates (beginnings of shaded areas) and business cycle trough dates (ends of shaded areas). The shading for a new contraction will be entered only after a trough has been designated.

Several different ratio and arithmetic scales are used to highlight the cyclical movements of the various series. The scale selected for each series is identified in the margin of the chart. Rates of change of various series can be compared with each other only where scales are identical. See the diagram, page 6, for additional help in using these charts.

Cyclical Comparisons (charts 3 and 4)

These charts compare the performance of selected indicators during the current expansion with their performance during the expansion phase of previous business cycles. The usual date sequence followed in charts is disregarded, and instead the data are alined at the strategic point of the business cycle: For expansions, the reference trough (see chart 3) and specific trough (see chart 4). Thus, these comparisons facilitate judgments on the vigor of the current expansion relative to cyclical movements during the expansions of previous cycles.

Two types of cyclical comparisons are made. Chart 3 compares the pattern of the current *reference cycle* (the cycle for aggregate economic activity) with movements over the corresponding phases of previous reference cycles. Chart 4 compares the pattern of the current *specific cycle* (the cycle for a particular series) with the movements over the corresponding phases of previous specific cycles in that series. In both charts, the trough dates are alined. In chart 3, the levels of the preceding peaks are also alined while in chart 4, the levels of the troughs are alined. See the section, "Comparisons of Cyclical Patterns", for more detailed descriptions of these comparisons.

Peak (P) of cycle indicates end of expansion and beginning of Recession (shaded areas) as designated by NBER.

CHART 1 — Business Cycle Series

Trough (T) of cycle indicates end of recession and beginning of Expansion (white areas) as designated by NBER.

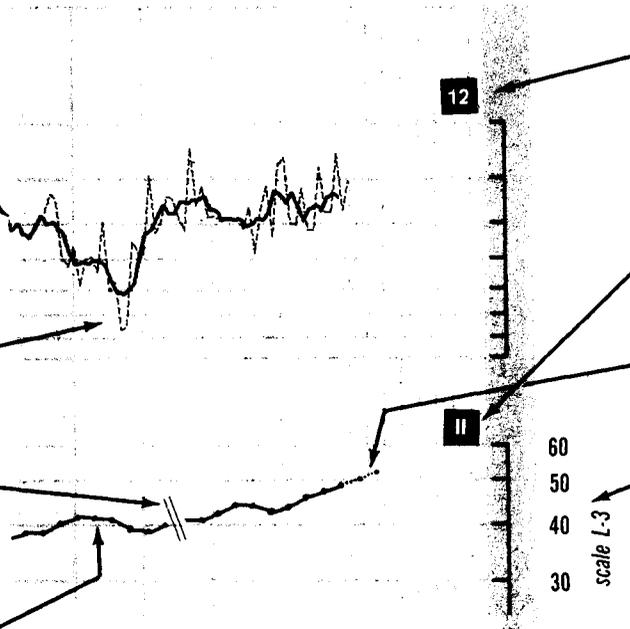
See **back cover** for complete titles and sources of series.

Solid line indicates monthly data. (Data may be actual monthly figures or MCD moving averages.*)

Broken line indicates actual monthly data for series where an MCD moving average* is plotted.

Parallel lines indicate a break in continuity (data not available, changes in series definitions, etc.).

Solid line with plotting points indicates quarterly data.



Arabic number indicates latest month for which data are plotted. ("12" = December)

Roman number indicates latest quarter for which data are plotted. ("II" = second quarter)

Dotted line indicates anticipated data.

Various scales are used to highlight the patterns of the individual series. Series plotted to different scales are not directly comparable. "Scale A" is an arithmetic scale, "scale L-1" is a logarithmic scale with 1 cycle in a given distance, "scale L-2" is a logarithmic scale with 2 cycles in that distance, etc.

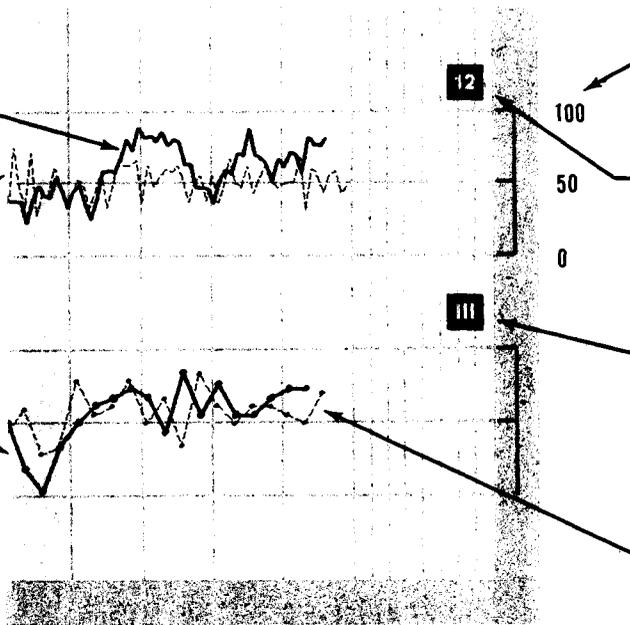
CHART 2 — Diffusion Indexes

Solid line indicates monthly data over 6- or 9-month spans.

Broken line indicates monthly data over 1-month spans.

Solid line with plotting points indicates quarterly data over various spans.

* Many of the more irregular series are shown in terms of their MCD moving averages as well as their actual monthly data. In such cases, the 4-, 5-, or 6-term moving averages are plotted 1½, 2, or 2½ months, respectively, behind the actual data. See page 2 for a description of MCD moving averages.



Scale shows percent of components rising.

Arabic number indicates latest month for which data are used in computing the indexes. ("12" = December)

Roman number indicates latest quarter for which data are used in computing the indexes. ("III" = third quarter)

Broken line with plotting points indicates quarterly data over various intervals. This line is also used to indicate anticipated quarterly data.

DESCRIPTIONS AND PROCEDURES

INTRODUCTION

Students of economic conditions describe the business cycle as consisting of alternating periods of expansion and contraction in production, employment, income, money flows, prices, and other economic processes. The fluctuations take place in a concerted manner, but not simultaneously. Once an expansion gets underway, it spreads from firm to firm, from industry to industry, from area to area, and from process to process, cumulating until a cyclical peak in aggregate activity is reached. Even while expansion is widespread during the upward phase of the business cycle, some activities continue to move in the opposite direction. Declines begin to spread as the expansion nears its peak and continue to spread even faster after the peak has been passed. But some activities continue to expand during the general contraction. Before long these expansions become stronger and more widespread. When they begin to dominate the situation, the upturn in aggregate activity has arrived and a new expansion is underway. This sequence is recurrent, but not periodic.

The causal relations among these various economic processes are primarily responsible for the cumulative nature of cyclical forces, and explain why expansion eventually turns into recession and recession into expansion. Cyclical fluctuations in production and employment are preceded by fluctuations in measures which relate to future rather than to current production—measures such as new orders for durable goods, the formation of new business enterprises, and accessions to payrolls. They are followed by fluctuations in various types of economic costs, such as labor costs, interest rates, fulfillment of long-term commitments, and holdings of inventories and of debts.

Intensive research by the National Bureau of Economic Research (NBER) over many years has provided a list of those significant series that usually lead, those that usually move with, and those that usually lag behind cyclical movements in aggregate economic ac-

tivity. The series have been grouped and classified by the NBER as “leading”, “roughly coincident”, or “lagging” indicators. These indicators are defined as follows:

- *NBER Leading Indicators.*—Series that usually reach peaks or troughs before those in aggregate economic activity as measured by the roughly coincident series (see below). One group of these series pertains to activities in the labor market, another to orders and contracts, and so on.
- *NBER Roughly Coincident Indicators.*—Series that are direct measures of aggregate economic activity or move roughly together with it; for example, nonagricultural employment, industrial production, and retail sales.
- *NBER Lagging Indicators.*—Series, such as new plant and equipment expenditures and manufacturers' inventories, that usually reach turning points after they are reached in aggregate economic activity.

Other U.S. series with business cycle significance are included in this report. 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.

METHOD OF PRESENTATION

Data are shown in this report in three general categories, as follows:

- *Basic Data* (chart 1 and tables 1 and 2).—Data are shown for business cycle indicators, additional

U.S. series with business cycle significance, and industrial production indexes for selected countries. 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* (chart 2 and tables 3 to 5).— These are measures that aid in forming a judgment of the imminence of a turning point in the business cycle, determining the extent of current changes in different parts of the economy, and pointing to developments in particular industries and places.
- ▶ *Cyclical Patterns* (chart 3 and tables 6 to 8).— Current cyclical levels are compared with levels 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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MCD is, on average, the first span of months for which the average change for the cyclical factor is greater than that of the irregular factor and remains so. It is small for smooth series and large for irregular series. The month-to-month differences between moving averages of the period equal to MCD are commensurate with the differences between seasonally adjusted values separated by the same MCD span; thus, the month-to-month differences in a 3-month moving average are commensurate with differences in seasonally adjusted values over 3-month spans. MCD moving averages all have about the same degree of smoothness. Consequently, MCD moving averages of highly irregular series, such as business failures and Federal cash payments, will show their cyclical movements about as clearly as the seasonally adjusted data for such smooth series as industrial production.

MCD moving averages are shown in chart 1 for all series with an MCD of "5" or more. To provide an indication of the variation about these moving averages, seasonally adjusted data are also plotted beginning with 1958. Although not so smooth as more powerful moving averages (such as the weighted 15-term Spencer curve), the MCD curve is more current and has a smaller rounding bias around business cycle peaks and troughs. On balance, the MCD curve seems to offer a reasonable compromise in terms of currency, smoothness, and fidelity to the patterns of business cycle fluctuations.

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To compile timing distributions for the current cyclical phase, the data for the leading and roughly coincident business cycle indicators are scanned each month. During a business cycle expansion, the date of the high value for each series is recorded. (For inverted series—that is, series with negative conformity to the business cycle—dates of low values are taken.) 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 may be disregarded, although it is, of course, difficult to identify an erratic value, particularly for the current month.

The letter "H" is used in table 2 to identify and highlight the current high values during the expansion. The highs designated during the current cyclical phase will not necessarily be the specific cycle peaks. (See appendix B.) As new high levels are reached during the expansion, the current highs will be moved ahead. Comparisons of the current timing distributions with those for periods around earlier business cycle 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 simply reflect a short reversal in the upward movement.

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Diffusion indexes are simple summary measures of groups of economic series. They express, for a given aggregate series, the percent of the series components which have risen over given spans 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 and widespread declines with sharp reductions in aggregate activity.

The diffusion indexes in this report are grouped according to the timing classification of the NBER. For monthly series, comparisons are made over 1-month spans (January-February, February-March, etc.) and generally for either 6- or 9-month spans, depending upon the irregularity of the series. The indexes based on 1-month spans are more "current" but they are also more irregular than the 6- or 9-month indexes. (See chart 2.) Quarterly series are compared over 1-quarter spans, 3-quarter spans, and 4-quarter spans.

Recent research has shown that the longer-span diffusion indexes are not only smoother, but have systematically larger amplitudes than the 1-month indexes. The 1-month indexes generally have large irregular fluctuations, but the movements may be significant when important changes are taking place, particularly around cyclical turning points. Since the longer-span diffusion indexes are centered, there is an apparent loss in currency equal to one-half the span; for example, 3 months in the case of a 6-month diffusion index. However, the most recent figure for a 6-month or longer-span index does provide the latest available information on changes *over that span*. If a significant reversal has taken place *within that span*, the 1-month indexes are likely to reveal it. Presentation of both 1-month and longer-span diffusion indexes provides an opportunity for the user to take advantage of the best features of each in interpreting current changes.

Series numbers preceded by the letter "D" designate diffusion indexes. When one of these numbers corresponds to the number of a basic indicator series, 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 6. Diffusion indexes not computed from basic series components are assigned new numbers.

Diffusion indexes that are based on business expectations 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.

Direction-of-Change Table

The direction-of-change table (table 5) shows directions of change ("+" for rising, "o" for unchanged,

and "-" for falling) in the components used for the diffusion indexes. This table provides a convenient view of changing business conditions and is helpful in making an economic interpretation of the movements in the more highly aggregated statistical measures. That is, it shows which economic activities went up, which went down, and how long such movements have persisted. The table also helps to show how a recession or recovery spreads from one sector of the economy to another.

Directions of change for most diffusion index components are shown for consecutive months and, depending upon the irregularity of the series, for either 6- or 9-month spans.

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 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 whether the current cyclical phase is an expansion or contraction.

Expansions are compared in one way by measuring changes from the immediately preceding peak levels. In table 6 of this report, data for the latest month in the current expansion (shown by number of months from the February 1961 trough) are compared with the May 1960 reference peak. For each earlier expansion, data for a like period (same number of months from the trough of the expansion) are compared with the preceding reference peak. This type of comparison is designated as changes computed *from reference peak levels and from reference trough dates*. This type of comparison shows whether, and by how much, the current level of activity exceeds or falls short of the level at the preceding business cycle peak, and how the current situation compares, in this respect, with earlier expansions. For those earlier periods of expansion that were shorter than the current one, the comparisons reflect the status at a point after a new contraction had set in.

Expansions are also compared by computing changes *from reference trough levels and from reference trough dates* (table 7). For the current expansion, this type of comparison measures the extent of the rise from the trough level (February 1961) to the level at the current month. For each earlier expansion,

sion, data for a like period (same number of months from the trough of the expansion) are compared with the level at the trough. The same situation exists here as for the comparisons shown in table 6: For earlier expansions that were shorter than the current one, the comparisons show the status at a point after a new contraction had set in.

Contractions can be 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 changes *from reference peak levels and from reference peak dates*. These comparisons will be made during a contraction period.

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 for the index of industrial production is January 1960 (corresponding to the May 1960 reference peak); the specific peak for stock prices is July 1959. (See appendix B.) Specific cycle comparisons are shown in table 8. For earlier expansions, these comparisons differ from those shown for reference cycles in that they show only the period up to the next specific peak date and do not include any part of the contraction that followed. In many cases, therefore, the earlier comparisons cover fewer months than those for the current expansion.

Nearly all series have undergone changes in definition, coverage, or estimation procedure since 1919; therefore, the historical comparisons are to be considered only approximate. Furthermore, it is sometimes necessary to use data for a closely related series for cycles prior to the period covered by the series used currently. The principal substitutions of this type are as follows:

7. New private nonfarm dwelling units started (prior to 1948: Residential building contracts, floor space, by F. W. Dodge Corp.)
41. Number of employees in nonagricultural establishments (prior to 1929: Factory employment)
52. Personal income (prior to 1929: Quarterly data as published by Barger and Klein)
54. Sales of retail stores (prior to 1929: Department store sales)
62. Index of labor cost per unit of output, total manufacturing (prior to 1948: Production worker wage cost per unit).

CHARTS

Two types of charts are used to highlight the cyclical patterns of the business cycle indicators: Historical time series and cyclical comparisons.

Historical Time Series (charts 1 and 2)

These charts show cyclical fluctuations against the background of expansions and contractions in general business activity from 1948 to the current month. Shaded areas on the charts indicate periods of business cycle contractions between business cycle peak dates (beginnings of shaded areas) and business cycle trough dates (ends of shaded areas). The shading for a new contraction will be entered only after a trough has been designated.

Several different ratio and arithmetic scales are used to highlight the cyclical movements of the various series. The scale selected for each series is identified in the margin of the chart. Rates of change of various series can be compared with each other only where scales are identical. See the diagram, page 6, for additional help in using these charts.

Cyclical Comparisons (charts 3 and 4)

These charts compare the performance of selected indicators during the current expansion with their performance during the expansion phase of previous business cycles. The usual date sequence followed in charts is disregarded, and instead the data are alined at the strategic point of the business cycle: For expansions, the reference trough (see chart 3) and specific trough (see chart 4). Thus, these comparisons facilitate judgments on the vigor of the current expansion relative to cyclical movements during the expansions of previous cycles.

Two types of cyclical comparisons are made. Chart 3 compares the pattern of the current *reference cycle* (the cycle for aggregate economic activity) with movements over the corresponding phases of previous reference cycles. Chart 4 compares the pattern of the current *specific cycle* (the cycle for a particular series) with the movements over the corresponding phases of previous specific cycles in that series. In both charts, the trough dates are alined. In chart 3, the levels of the preceding peaks are also alined while in chart 4, the levels of the troughs are alined. See the section, "Comparisons of Cyclical Patterns", for more detailed descriptions of these comparisons.

HOW TO READ CHARTS 1 AND 2

Peak (P) of cycle indicates end of expansion and beginning of Recession (shaded areas) as designated by NBER.

CHART 1 — Business Cycle Series

Trough (T) of cycle indicates end of recession and beginning of Expansion (white areas) as designated by NBER.

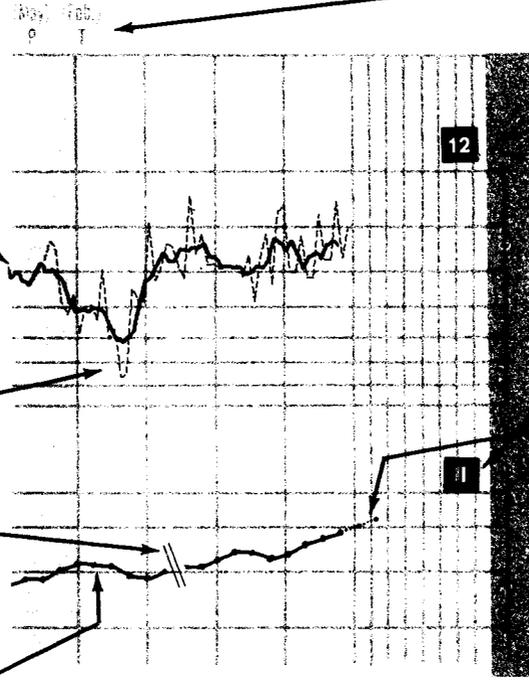
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Solid line indicates monthly data. (Data may be actual monthly figures or MCD moving averages.*)

Broken line indicates actual monthly data for series where an MCD moving average * is plotted.

Parallel lines indicate a break in continuity (data not available, changes in series definitions, etc.).

Solid line with plotting points indicates quarterly data.



Arabic number indicates latest month for which data are plotted. ("12" = December)

Roman number indicates latest quarter for which data are plotted. ("II" = second quarter)

Dotted line indicates anticipated data.

Various scales are used to highlight the patterns of the individual series. Series plotted to different scales are not directly comparable. "Scale A" is an arithmetic scale, "scale L-1" is a logarithmic scale with 1 cycle in a given distance, "scale L-2" is a logarithmic scale with 2 cycles in that distance, etc.

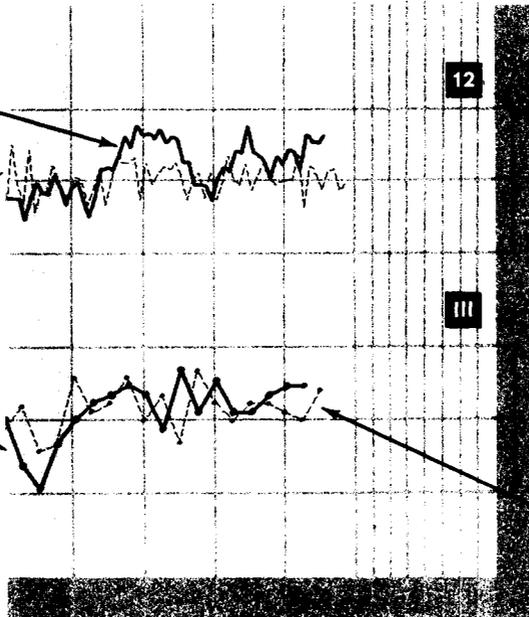
CHART 2 — Diffusion Indexes

Solid line indicates monthly data over 6- or 9-month spans.

Broken line indicates monthly data over 1-month spans.

Solid line with plotting points indicates quarterly data over various spans.

* Many of the more irregular series are shown in terms of their MCD moving averages as well as their actual monthly data. In such cases, the 4-, 5-, or 6-term moving averages are plotted 1½, 2, or 2½ months, respectively, behind the actual data. See page 2 for a description of MCD moving averages.



Scale shows percent of components rising.

Arabic number indicates latest month for which data are used in computing the indexes. ("12" = December)

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Broken line with plotting points indicates quarterly data over various intervals. This line is also used to indicate anticipated quarterly data.

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INTRODUCTION

Students of economic conditions describe the business cycle as consisting of alternating periods of expansion and contraction in production, employment, income, money flows, prices, and other economic processes. The fluctuations take place in a concerted manner, but not simultaneously. Once an expansion gets underway, it spreads from firm to firm, from industry to industry, from area to area, and from process to process, cumulating until a cyclical peak in aggregate activity is reached. Even while expansion is widespread during the upward phase of the business cycle, some activities continue to move in the opposite direction. Declines begin to spread as the expansion nears its peak and continue to spread even faster after the peak has been passed. But some activities continue to expand during the general contraction. Before long these expansions become stronger and more widespread. When they begin to dominate the situation, the upturn in aggregate activity has arrived and a new expansion is underway. This sequence is recurrent, but not periodic.

The causal relations among these various economic processes are primarily responsible for the cumulative nature of cyclical forces, and explain why expansion eventually turns into recession and recession into expansion. Cyclical fluctuations in production and employment are preceded by fluctuations in measures which relate to future rather than to current production—measures such as new orders for durable goods, the formation of new business enterprises, and accessions to payrolls. They are followed by fluctuations in various types of economic costs, such as labor costs, interest rates, fulfillment of long-term commitments, and holdings of inventories and of debts.

Although this pattern has been characteristic of American economic history, today many economists do not consider it inevitable.

Intensive research by the National Bureau of Economic Research (NBER) over many years has provided

a list of those significant series that usually lead, those that usually move with, and those that usually lag behind cyclical movements in aggregate economic activity. The series have been grouped and classified by the NBER as “leading”, “roughly coincident”, or “lagging” indicators. These indicators are defined as follows:

- ▷ *NBER Leading Indicators*.—Series that usually reach peaks or troughs before those in aggregate economic activity as measured by the roughly coincident series (see below). One group of these series pertains to activities in the labor market, another to orders and contracts, and so on.
- ▷ *NBER Roughly Coincident Indicators*.—Series that are direct measures of aggregate economic activity or move roughly together with it; for example, nonagricultural employment, industrial production, and retail sales.
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Other U.S. series with business cycle significance are included in this report. 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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- ▷ *Analytical Measures* (chart 2 and tables 3 to 5).— These are measures that aid in forming a judgment of the imminence of a turning point in the business cycle, determining the extent of current changes in different parts of the economy, and pointing to developments in particular industries and places.
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Studies of the effect of unusual weather upon some series have also been started. It is important to note, however, that present methods adjust for *average* weather conditions and not for the *dispersion* about this average; that is, present methods are designed to adjust for normal but not abnormal weather at any time of the year. For this reason, many seasonally adjusted series, such as housing starts, will tend to be low in months when the weather is unusually bad and high in months when the weather is unusually good. While it eventually may be possible, Census methods do not at present make any adjustments for such variations.

MCD MOVING AVERAGES

MCD (months for cyclical dominance) is an estimate of the appropriate span over which to observe the cyclical movements in a monthly series. This span is usually longer than a single month because month-to-month changes are often dominated by erratic movements, but shorter than the frequently used 12-month span (change from the same month a year ago), and is different for different series (see appendix C for MCD values and method of computation).

MCD is, on average, the first span of months for which the average change for the cyclical factor is greater than that of the irregular factor and remains so. It is small for smooth series and large for irregular series. The month-to-month differences between moving averages of the period equal to MCD are commensurate with the differences between seasonally adjusted values separated by the same MCD span; thus, the month-to-month differences in a 3-month moving average are commensurate with differences in seasonally adjusted values over 3-month spans. MCD moving averages all have about the same degree of smoothness. Consequently, MCD moving averages of highly irregular series, such as business failures and Federal cash payments, will show their cyclical movements about as clearly as the seasonally adjusted data for such smooth series as industrial production.

MCD moving averages are shown in chart 1 for all series with an MCD of "5" or more. To provide an indication of the variation about these moving averages, seasonally adjusted data are also plotted beginning with 1958. Although not so smooth as more powerful moving averages (such as the weighted 15-term Spencer curve), the MCD curve is more current and has a smaller rounding bias around business cycle peaks and troughs. On balance, the MCD curve seems to offer a reasonable compromise in terms of currency, smoothness, and fidelity to the patterns of business cycle fluctuations.

Because of advance reporting and preliminary seasonal factors, the MCD's for current data are usually larger than those computed from historical series and shown in appendix C. MCD is usually computed for a fairly long period, one covering both expansions and contractions. Since the pace of change varies from phase to phase of the business cycle, such a measure will not provide an accurate estimate of the span over which to estimate cyclically significant changes at all times. Thus, MCD computed for the period 1953-63 is likely to be too high during the early stages of recovery when expansion has usually been rapid and too low during the late stages of expansion when the rate of advance has usually been small. This limitation should be borne in mind when making use of this measure.¹

ANALYTICAL MEASURES OF CURRENT CHANGE

Three kinds of analytical measures are presented—timing distributions, diffusion indexes, and directions of change. These measures aid in forming a judgment of the 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.

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. This timing distribution shows the number of series reaching new highs and the percent currently high for each of several recent months (see table

¹ For a more complete description of MCD and its use in studying economic series, see *Business Cycle Indicators*, Geoffrey H. Moore, editor; National Bureau of Economic Research, Inc., vol. 1, ch. 18, "Statistics for Short-Term Economic Forecasting," by Julius Shiskin (Princeton University Press: 1961).

3). Similar distributions of "lows" will be presented 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 leading and roughly coincident business cycle indicators are scanned each month. During a business cycle expansion, the date of the high value for each series is recorded. (For inverted series—that is, series with negative conformity to the business cycle—dates of low values are taken.) 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 may be disregarded, although it is, of course, difficult to identify an erratic value, particularly for the current month.

The letter "H" is used in table 2 to identify and highlight the current high values during the expansion. The highs designated during the current cyclical phase will not necessarily be the specific cycle peaks. (See appendix B.) As new high levels are reached during the expansion, the current highs will be moved ahead. Comparisons of the current timing distributions with those for periods around earlier business cycle 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 simply reflect a short reversal in the upward movement.

Diffusion Indexes

Diffusion indexes are simple summary measures of groups of economic series. They express, for a given aggregate series, the percent of the series components which have risen over given spans 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 and widespread declines with sharp reductions in aggregate activity.

The diffusion indexes in this report are grouped according to the timing classification of the NBER. For monthly series, comparisons are made over 1-month spans (January-February, February-March, etc.) and generally for either 6- or 9-month spans, depending upon the irregularity of the series. The indexes based on 1-month spans are more "current" but they are also more irregular than the 6- or 9-month indexes. (See chart 2.) Quarterly series are compared over 1-quarter spans, 3-quarter spans, and 4-quarter spans.

Recent research has shown that the longer-span diffusion indexes are not only smoother, but have systematically larger amplitudes than the 1-month indexes. The 1-month indexes generally have large irregular fluctuations, but the movements may be significant when important changes are taking place, particularly around cyclical turning points. Since the longer-span diffusion indexes are centered, there is an apparent loss in currency equal to one-half the span; for example, 3 months in the case of a 6-month diffusion index. However, the most recent figure for a 6-month or longer-span index does provide the latest available information on changes *over that span*. If a significant reversal has taken place *within that span*, the 1-month indexes are likely to reveal it. Presentation of both 1-month and longer-span diffusion indexes provides an opportunity for the user to take advantage of the best features of each in interpreting current changes.

Series numbers preceded by the letter "D" designate diffusion indexes. When one of these numbers corresponds to the number of a basic indicator series, 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 6. Diffusion indexes not computed from basic series components are assigned new numbers.

Diffusion indexes that are based on business expectations 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.

Direction-of-Change Table

The direction-of-change table (table 5) shows directions of change ("+" for rising, "o" for unchanged,

and "-" for falling) in the components used for the diffusion indexes. This table provides a convenient view of changing business conditions and is helpful in making an economic interpretation of the movements in the more highly aggregated statistical measures. That is, it shows which economic activities went up, which went down, and how long such movements have persisted. The table also helps to show how a recession or recovery spreads from one sector of the economy to another.

Directions of change for most diffusion index components are shown for consecutive months and, depending upon the irregularity of the series, for either 6- or 9-month spans.

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 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 whether the current cyclical phase is an expansion or contraction.

Expansions are compared in one way by measuring changes from the immediately preceding peak levels. In table 6 of this report, data for the latest month in the current expansion (shown by number of months from the February 1961 trough) are compared with the May 1960 reference peak. For each earlier expansion, data for a like period (same number of months from the trough of the expansion) are compared with the preceding reference peak. This type of comparison is designated as changes computed *from reference peak levels and from reference trough dates*. This type of comparison shows whether, and by how much, the current level of activity exceeds or falls short of the level at the preceding business cycle peak, and how the current situation compares, in this respect, with earlier expansions. For those earlier periods of expansion that were shorter than the current one, the comparisons reflect the status at a point after a new contraction had set in.

Expansions are also compared by computing changes *from reference trough levels and from reference trough dates* (table 7). For the current expansion, this type of comparison measures the extent of the rise from the trough level (February 1961) to the level at the current month. For each earlier expansion,

sion, data for a like period (same number of months from the trough of the expansion) are compared with the level at the trough. The same situation exists here as for the comparisons shown in table 6: For earlier expansions that were shorter than the current one, the comparisons show the status at a point after a new contraction had set in.

Contractions can be 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 changes *from reference peak levels and from reference peak dates*. These comparisons will be made during a contraction period.

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 for the index of industrial production is January 1960 (corresponding to the May 1960 reference peak); the specific peak for stock prices is July 1959. (See appendix B.) Specific cycle comparisons are shown in table 8. For earlier expansions, these comparisons differ from those shown for reference cycles in that they show only the period up to the next specific peak date and do not include any part of the contraction that followed. In many cases, therefore, the earlier comparisons cover fewer months than those for the current expansion.

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Two types of charts are used to highlight the cyclical patterns of the business cycle indicators: Historical time series and cyclical comparisons.

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These charts show cyclical fluctuations against the background of expansions and contractions in general business activity from 1948 to the current month. Shaded areas on the charts indicate periods of business cycle contractions between business cycle peak dates (beginnings of shaded areas) and business cycle trough dates (ends of shaded areas). The shading for a new contraction will be entered only after a trough has been designated.

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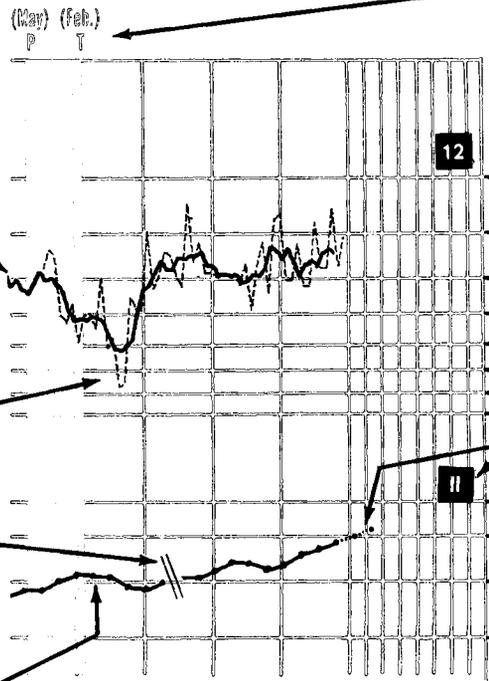
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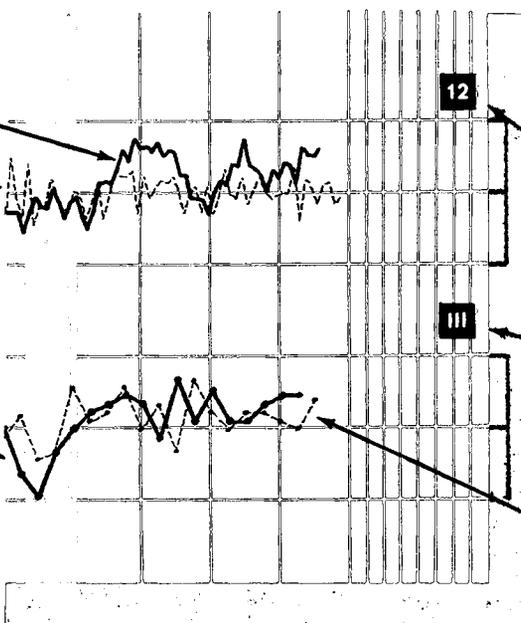
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MCD (months for cyclical dominance) is an estimate of the appropriate span over which to observe the cyclical movements in a monthly series. This span is usually longer than a single month because month-to-month changes are often dominated by erratic movements, but shorter than the frequently used 12-month span (change from the same month a year ago), and is different for different series (see appendix C for MCD values and method of computation).

MCD is, on average, the first span of months for which the average change for the cyclical factor is greater than that of the irregular factor and remains so. It is small for smooth series and large for irregular series. The month-to-month differences between moving averages of the period equal to MCD are commensurate with the differences between seasonally adjusted values separated by the same MCD span; thus, the month-to-month differences in a 3-month moving average are commensurate with differences in seasonally adjusted values over 3-month spans. MCD moving averages all have about the same degree of smoothness. Consequently, MCD moving averages of highly irregular series, such as business failures and Federal cash payments, will show their cyclical movements about as clearly as the seasonally adjusted data for such smooth series as industrial production.

MCD moving averages are shown in chart 1 for all series with an MCD of "5" or more. To provide an indication of the variation about these moving averages, seasonally adjusted data are also plotted beginning with 1958. Although not so smooth as more powerful moving averages (such as the weighted 15-term Spencer curve), the MCD curve is more current and has a smaller rounding bias around business cycle peaks and troughs. On balance, the MCD curve seems to offer a reasonable compromise in terms of currency, smoothness, and fidelity to the patterns of business cycle fluctuations.

Because of advance reporting and preliminary seasonal factors, the MCD's for current data are usually larger than those computed from historical series and shown in appendix C. MCD is usually computed for a fairly long period, one covering both expansions and contractions. Since the pace of change varies from phase to phase of the business cycle, such a measure will not provide an accurate estimate of the span over which to estimate cyclically significant changes at all times. Thus, MCD computed for the period 1953-63 is likely to be too high during the early stages of recovery when expansion has usually been rapid and too low during the late stages of expansion when the rate of advance has usually been small. This limitation should be borne in mind when making use of this measure.¹

ANALYTICAL MEASURES OF CURRENT CHANGE

Three kinds of analytical measures are presented—timing distributions, diffusion indexes, and directions of change. These measures aid in forming a judgment of the 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.

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. This timing distribution shows the number of series reaching new highs and the percent currently high for each of several recent months (see table

¹For a more complete description of MCD and its use in studying economic series, see *Business Cycle Indicators*, Geoffrey H. Moore, editor; National Bureau of Economic Research, Inc., vol. 1, ch. 18, "Statistics for Short-Term Economic Forecasting," by Julius Shiskin (Princeton University Press: 1961).

3). Similar distributions of "lows" will be presented 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 leading and roughly coincident business cycle indicators are scanned each month. During a business cycle expansion, the date of the high value for each series is recorded. (For inverted series—that is, series with negative conformity to the business cycle—dates of low values are taken.) 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 may be disregarded, although it is, of course, difficult to identify an erratic value, particularly for the current month.

The letter "H" is used in table 2 to identify and highlight the current high values during the expansion. The highs designated during the current cyclical phase will not necessarily be the specific cycle peaks. (See appendix B.) As new high levels are reached during the expansion, the current highs will be moved ahead. Comparisons of the current timing distributions with those for periods around earlier business cycle 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 simply reflect a short reversal in the upward movement.

Diffusion Indexes

Diffusion indexes are simple summary measures of groups of economic series. They express, for a given aggregate series, the percent of the series components which have risen over given spans 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 and widespread declines with sharp reductions in aggregate activity.

The diffusion indexes in this report are grouped according to the timing classification of the NBER. For monthly series, comparisons are made over 1-month spans (January-February, February-March, etc.) and generally for either 6- or 9-month spans, depending upon the irregularity of the series. The indexes based on 1-month spans are more "current" but they are also more irregular than the 6- or 9-month indexes. (See chart 2.) Quarterly series are compared over 1-quarter spans, 3-quarter spans, and 4-quarter spans.

Recent research has shown that the longer-span diffusion indexes are not only smoother, but have systematically larger amplitudes than the 1-month indexes. The 1-month indexes generally have large irregular fluctuations, but the movements may be significant when important changes are taking place, particularly around cyclical turning points. Since the longer-span diffusion indexes are centered, there is an apparent loss in currency equal to one-half the span; for example, 3 months in the case of a 6-month diffusion index. However, the most recent figure for a 6-month or longer-span index does provide the latest available information on changes *over that span*. If a significant reversal has taken place *within that span*, the 1-month indexes are likely to reveal it. Presentation of both 1-month and longer-span diffusion indexes provides an opportunity for the user to take advantage of the best features of each in interpreting current changes.

Series numbers preceded by the letter "D" designate diffusion indexes. When one of these numbers corresponds to the number of a basic indicator series, 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 6. Diffusion indexes not computed from basic series components are assigned new numbers.

Diffusion indexes that are based on business expectations 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.

Direction-of-Change Table

The direction-of-change table (table 5) shows directions of change ("+" for rising, "o" for unchanged,

and "-" for falling) in the components used for the diffusion indexes. This table provides a convenient view of changing business conditions and is helpful in making an economic interpretation of the movements in the more highly aggregated statistical measures. That is, it shows which economic activities went up, which went down, and how long such movements have persisted. The table also helps to show how a recession or recovery spreads from one sector of the economy to another.

Directions of change for most diffusion index components are shown for consecutive months and, depending upon the irregularity of the series, for either 6- or 9-month spans.

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 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 whether the current cyclical phase is an expansion or contraction.

Expansions are compared in one way by measuring changes from the immediately preceding peak levels. In table 6 of this report, data for the latest month in the current expansion (shown by number of months from the February 1961 trough) are compared with the May 1960 reference peak. For each earlier expansion, data for a like period (same number of months from the trough of the expansion) are compared with the preceding reference peak. This type of comparison is designated as changes computed *from reference peak levels and from reference trough dates*. This type of comparison shows whether, and by how much, the current level of activity exceeds or falls short of the level at the preceding business cycle peak, and how the current situation compares, in this respect, with earlier expansions. For those earlier periods of expansion that were shorter than the current one, the comparisons reflect the status at a point after a new contraction had set in.

Expansions are also compared by computing changes *from reference trough levels and from reference trough dates* (table 7). For the current expansion, this type of comparison measures the extent of the rise from the trough level (February 1961) to the level at the current month. For each earlier expansion,

sion, data for a like period (same number of months from the trough of the expansion) are compared with the level at the trough. The same situation exists here as for the comparisons shown in table 6: For earlier expansions that were shorter than the current one, the comparisons show the status at a point after a new contraction had set in.

Contractions can be 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 changes *from reference peak levels and from reference peak dates*. These comparisons will be made during a contraction period.

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 for the index of industrial production is January 1960 (corresponding to the May 1960 reference peak); the specific peak for stock prices is July 1959. (See appendix B.) Specific cycle comparisons are shown in table 8. For earlier expansions, these comparisons differ from those shown for reference cycles in that they show only the period up to the next specific peak date and do not include any part of the contraction that followed. In many cases, therefore, the earlier comparisons cover fewer months than those for the current expansion.

Nearly all series have undergone changes in definition, coverage, or estimation procedure since 1919; therefore, the historical comparisons are to be considered only approximate. Furthermore, it is sometimes necessary to use data for a closely related series for cycles prior to the period covered by the series used currently. The principal substitutions of this type are as follows:

7. New private nonfarm dwelling units started (prior to 1948: Residential building contracts, floor space, by F. W. Dodge Corp.)
41. Number of employees in nonagricultural establishments (prior to 1929: Factory employment)
52. Personal income (prior to 1929: Quarterly data as published by Barger and Klein)
54. Sales of retail stores (prior to 1929: Department store sales)
62. Index of labor cost per unit of output, total manufacturing (prior to 1948: Production worker wage cost per unit).

CHARTS

Two types of charts are used to highlight the cyclical patterns of the business cycle indicators: Historical time series and cyclical comparisons.

Historical Time Series (charts 1 and 2)

These charts show cyclical fluctuations against the background of expansions and contractions in general business activity from 1948 to the current month. Shaded areas on the charts indicate periods of business cycle contractions between business cycle peak dates (beginnings of shaded areas) and business cycle trough dates (ends of shaded areas). The shading for a new contraction will be entered only after a trough has been designated.

Several different ratio and arithmetic scales are used to highlight the cyclical movements of the various series. The scale selected for each series is identified in the margin of the chart. Rates of change of various series can be compared with each other only where scales are identical. See the diagram, page 6, for additional help in using these charts.

Cyclical Comparisons (charts 3 and 4)

These charts compare the performance of selected indicators during the current expansion with their performance during the expansion phase of previous business cycles. The usual date sequence followed in charts is disregarded, and instead the data are alined at the strategic point of the business cycle: For expansions, the reference trough (see chart 3) and specific trough (see chart 4). Thus, these comparisons facilitate judgments on the vigor of the current expansion relative to cyclical movements during the expansions of previous cycles.

Two types of cyclical comparisons are made. Chart 3 compares the pattern of the current *reference cycle* (the cycle for aggregate economic activity) with movements over the corresponding phases of previous reference cycles. Chart 4 compares the pattern of the current *specific cycle* (the cycle for a particular series) with the movements over the corresponding phases of previous specific cycles in that series. In both charts, the trough dates are alined. In chart 3, the levels of the preceding peaks are also alined while in chart 4, the levels of the troughs are alined. See the section, "Comparisons of Cyclical Patterns", for more detailed descriptions of these comparisons.

HOW TO READ CHARTS 1 AND 2

Peak (P) of cycle indicates end of expansion and beginning of Recession (shaded areas) as designated by NBER.

CHART 1 — Business Cycle Series

Trough (T) of cycle indicates end of recession and beginning of Expansion (white areas) as designated by NBER.

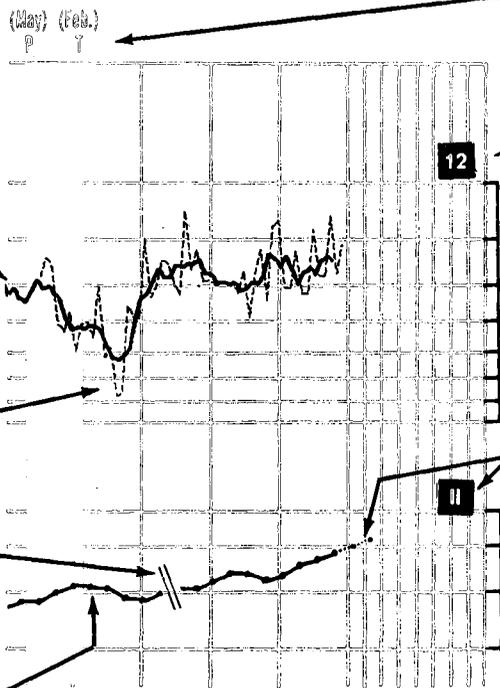
See back cover for complete titles and sources of series.

Solid line indicates monthly data. (Data may be actual monthly figures or MCD moving averages.*)

Broken line indicates actual monthly data for series where an MCD moving average* is plotted.

Parallel lines indicate a break in continuity (data not available, changes in series definitions, extreme values, etc.)

Solid line with plotting points indicates quarterly data.



Arabic number indicates latest month for which data are plotted. ("12" = December)

Roman number indicates latest quarter for which data are plotted. ("II" = second quarter)

Dotted line indicates anticipated data.

Various scales are used to highlight the patterns of the individual series. Series plotted to different scales are not directly comparable. "Scale A" is an arithmetic scale, "scale L-1" is a logarithmic scale with 1 cycle in a given distance, "scale L-2" is a logarithmic scale with 2 cycles in that distance, etc.

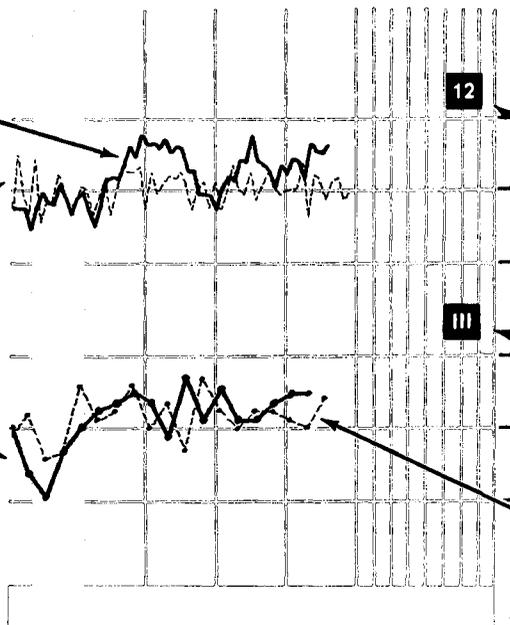
CHART 2 — Diffusion Indexes

Solid line indicates monthly data over 6- or 9-month spans.

Broken line indicates monthly data over 1-month spans.

Solid line with plotting points indicates quarterly data over various spans.

* Many of the more irregular series are shown in terms of their MCD moving averages as well as their actual monthly data. In such cases, the 4-, 5-, or 6-term moving averages are plotted 1½, 2, or 2½ months, respectively, behind the actual data. See page 2 for a description of MCD moving averages.



Scale shows percent of components rising.

Arabic number indicates latest month for which data are used in computing the indexes. ("12" = December)

Roman number indicates latest quarter for which data are used in computing the indexes. ("III" = third quarter)

Broken line with plotting points indicates quarterly data over various intervals. This line is also used to indicate anticipated quarterly data.

DESCRIPTIONS AND PROCEDURES

INTRODUCTION

Students of economic conditions describe the business cycle as consisting of alternating periods of expansion and contraction in production, employment, income, money flows, prices, and other economic processes. The fluctuations take place in a concerted manner, but not simultaneously. Once an expansion gets underway, it spreads from firm to firm, from industry to industry, from area to area, and from process to process, cumulating until a cyclical peak in aggregate activity is reached. Even while expansion is widespread during the upward phase of the business cycle, some activities continue to move in the opposite direction. Declines begin to spread as the expansion nears its peak and continue to spread even faster after the peak has been passed. But some activities continue to expand during the general contraction. Before long these expansions become stronger and more widespread. When they begin to dominate the situation, the upturn in aggregate activity has arrived and a new expansion is underway. This sequence is recurrent, but not periodic.

The causal relations among these various economic processes are primarily responsible for the cumulative nature of cyclical forces, and explain why expansion eventually turns into recession and recession into expansion. Cyclical fluctuations in production and employment are preceded by fluctuations in measures which relate to future rather than to current production—measures such as new orders for durable goods, the formation of new business enterprises, and accessions to payrolls. They are followed by fluctuations in various types of economic costs, such as labor costs, interest rates, fulfillment of long-term commitments, and holdings of inventories and of debts.

Although this pattern has been characteristic of American economic history, today many economists do not consider it inevitable.

Intensive research by the National Bureau of Economic Research (NBER) over many years has provided a list of those significant series that usually lead, those that usually move with, and those that usually lag behind cyclical movements in aggregate economic ac-

tivity. The series have been grouped and classified by the NBER as "leading", "roughly coincident", or "lagging" indicators. These indicators are defined as follows:

- ▶ *NBER Leading Indicators*.—Series that usually reach peaks or troughs before those in aggregate economic activity as measured by the roughly coincident series (see below). One group of these series pertains to activities in the labor market, another to orders and contracts, and so on.
- ▶ *NBER Roughly Coincident Indicators*.—Series that are direct measures of aggregate economic activity or move roughly together with it; for example, nonagricultural employment, industrial production, and retail sales.
- ▶ *NBER Lagging Indicators*.—Series, such as new plant and equipment expenditures and manufacturers' inventories, that usually reach turning points after they are reached in aggregate economic activity.

Other U.S. series with business cycle significance are included in this report. 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.

The list of series covered and sources of the basic data are shown on the back cover of this report. Series numbers are for identification only and do not reflect series relationships or order.

METHOD OF PRESENTATION

Data are shown in this report in three general categories, as follows:

- ▶ *Basic Data* (chart 1 and tables 1 and 2).—Data are shown for business cycle indicators, additional

U.S. series with business cycle significance, and industrial production indexes for selected countries. 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* (chart 2 and tables 3 to 5).— These are measures that aid in forming a judgment of the imminence of a turning point in the business cycle, determining the extent of current changes in different parts of the economy, and pointing to developments in particular industries and places.
- ▷ *Cyclical Patterns* (chart 3 and tables 6 to 8).— Current cyclical levels are compared with levels 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.

DESIGNATION OF BUSINESS CYCLE TURNING POINTS

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

Monthly business cycle peaks and troughs have been dated by the NBER for the period 1854-1961. Over this span, expansion has prevailed 61 percent of the time and contraction, 39 percent. If war periods are disregarded, expansion has prevailed 56 percent of the time and contraction, 44 percent.

SEASONAL AND RELATED STATISTICAL ADJUSTMENTS

Adjustments for normal seasonal fluctuations are often necessary to bring out the underlying cyclical trends of a series. Such adjustments allow for periodic intra-year variations resulting chiefly from normal differences in weather conditions during the year and from various institutional arrangements. Some series contain considerable variation attributable to the number of working or trading days in each month. An additional adjustment is necessary in such cases to reduce this variation. Variations due to holidays are usually accounted for by the seasonal adjustment process; how-

ever, there are some cases in which a separate holiday adjustment is necessary for holidays with variable dates. Such a case is retail sales of apparel which is affected strongly by the date of Easter and, to a lesser degree, by the dates of Labor Day and Thanksgiving.

In general, the seasonal adjustment process is designed to adjust for *average* weather conditions but not for the dispersion about that average. Thus, some seasonally adjusted series, such as housing starts, will tend to be low in months of unusually bad weather and high during unusually good weather. At the Bureau of the Census, studies have been started on some series to determine the effects of abnormal weather. Although it eventually may be possible, Census methods do not at present make any adjustments for such variations.

Most of the series contained in this report are presented in seasonally adjusted form. Unadjusted data are used only for those series which appear to have no pattern of seasonal variation. (Unadjusted series are identified in table 2.) In most cases, the seasonally adjusted data used for a series are the official figures released by the source agency; therefore, several different methods of seasonal adjustment are involved. In addition, 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. For these series, seasonal adjustments have been developed by either the NBER or the Census Bureau. The adjustment factors for these series, derived by Census Method II, are shown in appendix D. Factors for series which are the sums of seasonally adjusted components or which are based on unpublished source data are not shown.

MCD MOVING AVERAGES

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MCD is, on average, the first span of months for which the average change for the cyclical factor is greater than that of the irregular factor and remains so. It is small for smooth series and large for irregular series. The month-to-month differences between moving averages of the period equal to MCD are commensurate with the differences between seasonally adjusted values separated by the same MCD span; thus, the month-to-month differences in a 3-month

moving average are commensurate with differences in seasonally adjusted values over 3-month spans. MCD moving averages all have about the same degree of smoothness. Consequently, MCD moving averages of highly irregular series, such as business failures and Federal cash payments, will show their cyclical movements about as clearly as the seasonally adjusted data for such smooth series as industrial production.

MCD moving averages are shown in chart 1 for all series with an MCD of "5" or more. To provide an indication of the variation about these moving averages, seasonally adjusted data are also plotted beginning with 1958. Although not so smooth as more powerful moving averages (such as the weighted 15-term Spencer curve), the MCD curve is more current and has a smaller rounding bias around business cycle peaks and troughs. On balance, the MCD curve seems to offer a reasonable compromise in terms of currency, smoothness, and fidelity to the patterns of business cycle fluctuations.

Because of advance reporting and preliminary seasonal factors, the MCD's for current data are usually larger than those computed from historical series and shown in appendix C. MCD is usually computed for a fairly long period, one covering both expansions and contractions. Since the pace of change varies from phase to phase of the business cycle, such a measure will not provide an accurate estimate of the span over which to estimate cyclically significant changes at all times. Thus, MCD computed for the period 1953-63 is likely to be too high during the early stages of recovery when expansion has usually been rapid and too low during the late stages of expansion when the rate of advance has usually been small. This limitation should be borne in mind when making use of this measure.¹

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Three kinds of analytical measures are presented—timing distributions, diffusion indexes, and directions of change. These measures aid in forming a judgment of the 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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Series numbers preceded by the letter "D" designate diffusion indexes. When one of these numbers corresponds to the number of a basic indicator series, 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 6. Diffusion indexes not computed from basic series components are assigned new numbers.

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Expansions are also compared by computing changes *from reference trough levels and from reference trough dates* (table 7). For the current expansion, this type of comparison measures the extent of the rise from the trough level (February 1961) to the

level at the current month. For each earlier expansion, data for a like period (same number of months from the trough of the expansion) are compared with the level at the trough. The same situation exists here as for the comparisons shown in table 6: For earlier expansions that were shorter than the current one, the comparisons show the status at a point after a new contraction had set in.

Contractions can be 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 changes *from reference peak levels and from reference peak dates*. These comparisons will be made during a contraction period.

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 for the index of industrial production is January 1960 (corresponding to the May 1960 reference peak); the specific peak for stock prices is July 1959. (See appendix B.) Specific cycle comparisons are shown in table 8. For earlier expansions, these comparisons differ from those shown for reference cycles in that they show only the period up to the next specific peak date and do not include any part of the contraction that followed. In many cases, therefore, the earlier comparisons cover fewer months than those for the current expansion.

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62. Index of labor cost per unit of output, total manufacturing (prior to 1948: Production worker wage cost per unit).

CHARTS

Two types of charts are used to highlight the cyclical patterns of the business cycle indicators: Historical time series and cyclical comparisons.

Historical Time Series (charts 1 and 2)

These charts show cyclical fluctuations against the background of expansions and contractions in general business activity from 1948 to the current month. Shaded areas on the charts indicate periods of business cycle contractions between business cycle peak dates (beginnings of shaded areas) and business cycle trough dates (ends of shaded areas). The shading for a new contraction will be entered only after a trough has been designated.

Several different ratio and arithmetic scales are used to highlight the cyclical movements of the various series. The scale selected for each series is identified in the margin of the chart. Rates of change of various series can be compared with each other only where scales are identical. See the diagram, page 6, for additional help in using these charts.

Cyclical Comparisons (charts 3 and 4)

These charts compare the performance of selected indicators during the current expansion with their performance during the expansion phase of previous business cycles. The usual date sequence followed in charts is disregarded, and instead the data are alined at the strategic point of the business cycle: For expansions, the reference trough (see chart 3) and specific trough (see chart 4). Thus, these comparisons facilitate judgments on the vigor of the current expansion relative to cyclical movements during the expansions of previous cycles.

Two types of cyclical comparisons are made. Chart 3 compares the pattern of the current *reference cycle* (the cycle for aggregate economic activity) with movements over the corresponding phases of previous reference cycles. Chart 4 compares the pattern of the current *specific cycle* (the cycle for a particular series) with the movements over the corresponding phases of previous specific cycles in that series. In both charts, the trough dates are alined. In chart 3, the levels of the preceding peaks are also alined while in chart 4, the levels of the troughs are alined. See the section, "Comparisons of Cyclical Patterns", for more detailed descriptions of these comparisons.

HOW TO READ CHARTS 1 AND 2

Peak (P) of cycle indicates end of expansion and beginning of Recession (shaded areas) as designated by NBER.

CHART 1 – Business Cycle Series

Trough (T) of cycle indicates end of recession and beginning of Expansion (white areas) as designated by NBER.

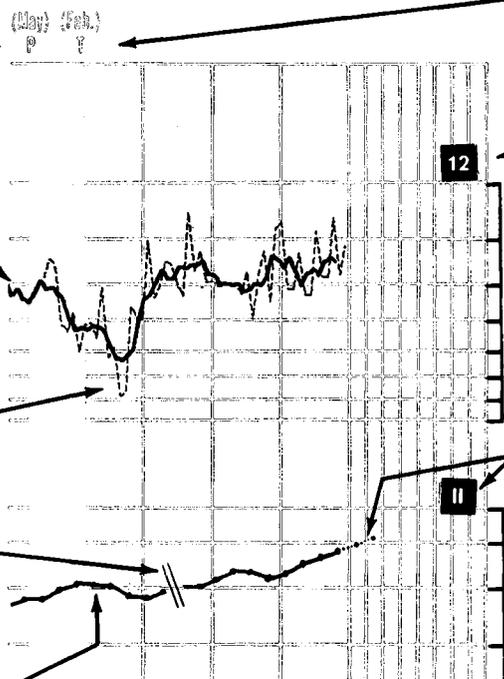
See back cover for complete titles and sources of series.

Solid line indicates monthly data. (Data may be actual monthly figures or MCD moving averages.*)

Broken line indicates actual monthly data for series where an MCD moving average* is plotted.

Parallel lines indicate a break in continuity (data not available, changes in series definitions, extreme values, etc.)

Solid line with plotting points indicates quarterly data.



Arabic number indicates latest month for which data are plotted. ("12" = December)

Roman number indicates latest quarter for which data are plotted. ("II" = second quarter)

Dotted line indicates anticipated data.

Various scales are used to highlight the patterns of the individual series. Series plotted to different scales are not directly comparable. "Scale A" is an arithmetic scale, "scale L-1" is a logarithmic scale with 1 cycle in a given distance, "scale L-2" is a logarithmic scale with 2 cycles in that distance, etc.

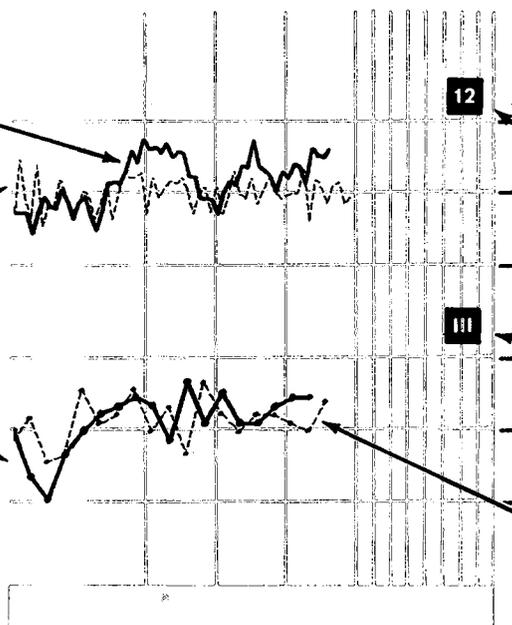
CHART 2 – Diffusion Indexes

Solid line indicates monthly data over 6- or 9-month spans.

Broken line indicates monthly data over 1-month spans.

Solid line with plotting points indicates quarterly data over various spans.

* Many of the more irregular series are shown in terms of their MCD moving averages as well as their actual monthly data. In such cases, the 4-, 5-, or 6-term moving averages are plotted 1½, 2, or 2½ months, respectively, behind the actual data. See page 2 for a description of MCD moving averages.



Scale shows percent of components rising.

Arabic number indicates latest month for which data are used in computing the indexes. ("12" = December)

Roman number indicates latest quarter for which data are used in computing the indexes. ("III" = third quarter)

Broken line with plotting points indicates quarterly data over various intervals. This line is also used to indicate anticipated quarterly data.

DESCRIPTIONS AND PROCEDURES

INTRODUCTION

Students of economic conditions describe the business cycle as consisting of alternating periods of expansion and contraction in production, employment, income, money flows, prices, and other economic processes. The fluctuations take place in a concerted manner, but not simultaneously. Once an expansion gets underway, it spreads from firm to firm, from industry to industry, from area to area, and from process to process, cumulating until a cyclical peak in aggregate activity is reached. Even while expansion is widespread during the upward phase of the business cycle, some activities continue to move in the opposite direction. Declines begin to spread as the expansion nears its peak and continue to spread even faster after the peak has been passed. But some activities continue to expand during the general contraction. Before long these expansions become stronger and more widespread. When they begin to dominate the situation, the upturn in aggregate activity has arrived and a new expansion is underway. This sequence is recurrent, but not periodic.

The causal relations among these various economic processes are primarily responsible for the cumulative nature of cyclical forces, and explain why expansion eventually turns into recession and recession into expansion. Cyclical fluctuations in production and employment are preceded by fluctuations in measures which relate to future rather than to current production—measures such as new orders for durable goods, the formation of new business enterprises, and accessions to payrolls. They are followed by fluctuations in various types of economic costs, such as labor costs, interest rates, fulfillment of long-term commitments, and holdings of inventories and of debts.

Although this pattern has been characteristic of American economic history, today many economists do not consider it inevitable.

Intensive research by the National Bureau of Economic Research (NBER) over many years has provided a list of those significant series that usually lead, those that usually move with, and those that usually lag behind cyclical movements in aggregate economic ac-

tivity. The series have been grouped and classified by the NBER as "leading", "roughly coincident", or "lagging" indicators. These indicators are defined as follows:

- ▷ *NBER Leading Indicators.*—Series that usually reach peaks or troughs before those in aggregate economic activity as measured by the roughly coincident series (see below). One group of these series pertains to activities in the labor market, another to orders and contracts, and so on.
- ▷ *NBER Roughly Coincident Indicators.*—Series that are direct measures of aggregate economic activity or move roughly together with it; for example, nonagricultural employment, industrial production, and retail sales.
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Other U.S. series with business cycle significance are included in this report. 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.

The list of series covered and sources of the basic data are shown on the back cover of this report. Series numbers are for identification only and do not reflect series relationships or order.

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Data are shown in this report in three general categories, as follows:

- ▷ *Basic Data* (chart 1 and tables 1 and 2).—Data are shown for business cycle indicators, additional

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- ▷ *Analytical Measures* (chart 2 and tables 3 to 5).— These are measures that aid in forming a judgment of the imminence of a turning point in the business cycle, determining the extent of current changes in different parts of the economy, and pointing to developments in particular industries and places.
- ▷ *Cyclical Patterns* (charts 3, 4; tables 6 to 8).— Current cyclical levels are compared with levels 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.

DESIGNATION OF BUSINESS CYCLE TURNING POINTS

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

Monthly business cycle peaks and troughs have been dated by the NBER for the period 1854-1961. Over this span, expansion has prevailed 61 percent of the time and contraction, 39 percent. If war periods are disregarded, expansion has prevailed 56 percent of the time and contraction, 44 percent.

SEASONAL AND RELATED STATISTICAL ADJUSTMENTS

Adjustments for normal seasonal fluctuations are often necessary to bring out the underlying cyclical trends of a series. Such adjustments allow for periodic intra-year variations resulting chiefly from normal differences in weather conditions during the year and from various institutional arrangements. Some series contain considerable variation attributable to the number of working or trading days in each month. An additional adjustment is necessary in such cases to reduce this variation. Variations due to holidays are usually accounted for by the seasonal adjustment process; how-

ever, there are some cases in which a separate holiday adjustment is necessary for holidays with variable dates. Such a case is retail sales of apparel which is affected strongly by the date of Easter and, to a lesser degree, by the dates of Labor Day and Thanksgiving.

In general, the seasonal adjustment process is designed to adjust for *average* weather conditions but not for the dispersion about that average. Thus, some seasonally adjusted series, such as housing starts, will tend to be low in months of unusually bad weather and high during unusually good weather. At the Bureau of the Census, studies have been started on some series to determine the effects of abnormal weather. Although it eventually may be possible, Census methods do not at present make any adjustments for such variations.

Most of the series contained in this report are presented in seasonally adjusted form. Unadjusted data are used only for those series which appear to have no pattern of seasonal variation. (Unadjusted series are identified in table 2.) In most cases, the seasonally adjusted data used for a series are the official figures released by the source agency; therefore, several different methods of seasonal adjustment are involved. In addition, 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. For these series, seasonal adjustments have been developed by either the NBER or the Census Bureau. The adjustment factors for these series, derived by Census Method II, are shown in appendix D. Factors for series which are the sums of seasonally adjusted components or which are based on unpublished source data are not shown.

MCD MOVING AVERAGES

MCD (months for cyclical dominance) is an estimate of the appropriate span over which to observe the cyclical movements in a monthly series. This span is usually longer than a single month because month-to-month changes are often dominated by erratic movements, but shorter than the frequently used 12-month span (change from the same month a year ago), and is different for different series (see appendix C for MCD values and method of computation).

MCD is, on average, the first span of months for which the average change for the cyclical factor is greater than that of the irregular factor and remains so. It is small for smooth series and large for irregular series. The month-to-month differences between moving averages of the period equal to MCD are commensurate with the differences between seasonally adjusted values separated by the same MCD span; thus, the month-to-month differences in a 3-month

moving average are commensurate with differences in seasonally adjusted values over 3-month spans. MCD moving averages all have about the same degree of smoothness. Consequently, MCD moving averages of highly irregular series, such as business failures and Federal cash payments, will show their cyclical movements about as clearly as the seasonally adjusted data for such smooth series as industrial production.

MCD moving averages are shown in chart 1 for all series with an MCD of "5" or more. To provide an indication of the variation about these moving averages, seasonally adjusted data are also plotted beginning with 1958. Although not so smooth as more powerful moving averages (such as the weighted 15-term Spencer curve), the MCD curve is more current and has a smaller rounding bias around business cycle peaks and troughs. On balance, the MCD curve seems to offer a reasonable compromise in terms of currency, smoothness, and fidelity to the patterns of business cycle fluctuations.

Because of advance reporting and preliminary seasonal factors, the MCD's for current data are usually larger than those computed from historical series and shown in appendix C. MCD is usually computed for a fairly long period, one covering both expansions and contractions. Since the pace of change varies from phase to phase of the business cycle, such a measure will not provide an accurate estimate of the span over which to estimate cyclically significant changes at all times. Thus, MCD computed for the period 1953-63 is likely to be too high during the early stages of recovery when expansion has usually been rapid and too low during the late stages of expansion when the rate of advance has usually been small. This limitation should be borne in mind when making use of this measure.¹

ANALYTICAL MEASURES OF CURRENT CHANGE

Three kinds of analytical measures are presented—timing distributions, diffusion indexes, and directions of change. These measures aid in forming a judgment of the 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.

¹ For a more complete description of MCD and its use in studying economic series, see *Business Cycle Indicators*, Geoffrey H. Moore, editor; National Bureau of Economic Research, Inc., vol. 1, ch. 18, "Statistics for Short-Term Economic Forecasting," by Julius Shiskin (Princeton University Press: 1961).

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. This timing distribution shows 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 presented 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 leading and roughly coincident business cycle indicators are scanned each month. During a business cycle expansion, the date of the high value for each series is recorded. (For inverted series—that is, series with negative conformity to the business cycle—dates of low values are taken.) 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 may be disregarded, although it is, of course, difficult to identify an erratic value, particularly for the current month.

The letter "H" is used in table 2 to identify and highlight the current high values during the expansion. The highs designated during the current cyclical phase will not necessarily be the specific cycle peaks. (See appendix B.) As new high levels are reached during the expansion, the current highs will be moved ahead. Comparisons of the current timing distributions with those for periods around earlier business cycle 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 simply reflect a short reversal in the upward movement.

Diffusion Indexes

Diffusion indexes are simple summary measures of groups of economic series. They express, for a given aggregate series, the percent of the series components

which have risen over given spans 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 and widespread declines with sharp reductions in aggregate activity.

The diffusion indexes in this report are grouped according to the timing classification of the NBER. For monthly series, comparisons are made over 1-month spans (January-February, February-March, etc.) and generally for either 6- or 9-month spans, depending upon the irregularity of the series. The indexes based on 1-month spans are more "current" but they are also more irregular than the 6- or 9-month indexes. (See chart 2.) Quarterly series are compared over 1-quarter spans, 3-quarter spans, and 4-quarter spans.

Recent research has shown that the longer-span diffusion indexes are not only smoother, but have systematically larger amplitudes than the 1-month indexes. The 1-month indexes generally have large irregular fluctuations, but the movements may be significant when important changes are taking place, particularly around cyclical turning points. Since the longer-span diffusion indexes are centered, there is an apparent loss in currency equal to one-half the span; for example, 3 months in the case of a 6-month diffusion index. However, the most recent figure for a 6-month or longer-span index does provide the latest available information on changes *over that span*. If a significant reversal has taken place *within that span*, the 1-month indexes are likely to reveal it. Presentation of both 1-month and longer-span diffusion indexes provides an opportunity for the user to take advantage of the best features of each in interpreting current changes.

Series numbers preceded by the letter "D" designate diffusion indexes. When one of these numbers corresponds to the number of a basic indicator series, 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 6. Diffusion indexes not computed from basic series components are assigned new numbers.

Diffusion indexes that are based on business expectations 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.

Direction-of-Change Table

The direction-of-change table (table 5) shows directions of change ("+" for rising, "o" for unchanged, and "-" for falling) in the components used for the diffusion indexes. This table provides a convenient view of changing business conditions and is helpful in making an economic interpretation of the movements in the more highly aggregated statistical measures. That is, it shows which economic activities went up, which went down, and how long such movements have persisted. The table also helps to show how a recession or recovery spreads from one sector of the economy to another.

Directions of change for most diffusion index components are shown for consecutive months and, depending upon the irregularity of the series, for either 6- or 9-month spans.

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 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 whether the current cyclical phase is an expansion or contraction.

Expansions are compared in one way by measuring changes from the immediately preceding peak levels. In table 6 of this report, data for the latest month in the current expansion (shown by number of months from the February 1961 trough) are compared with the May 1960 reference peak. For each earlier expansion, data for a like period (same number of months from the trough of the expansion) are compared with the preceding reference peak. This type of comparison is designated as changes computed *from reference peak levels and from reference trough dates*. This type of comparison shows whether, and by how much, the current level of activity exceeds or falls short of the level at the preceding business cycle peak, and how the current situation compares, in this respect, with earlier expansions. For those earlier periods of expansion that were shorter than the current one, the comparisons reflect the status at a point after a new contraction had set in.

Expansions are also compared by computing changes *from reference trough levels and from reference trough dates* (table 7). For the current expansion, this type of comparison measures the extent of the rise from the trough level (February 1961) to the

level at the current month. For each earlier expansion, data for a like period (same number of months from the trough of the expansion) are compared with the level at the trough. The same situation exists here as for the comparisons shown in table 6: For earlier expansions that were shorter than the current one, the comparisons show the status at a point after a new contraction had set in.

Contractions can be 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 *changes from reference peak levels and from reference peak dates*. These comparisons will be made during a contraction period.

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 for the index of industrial production is January 1960 (corresponding to the May 1960 reference peak); the specific peak for stock prices is July 1959. (See appendix B.) Specific cycle comparisons are shown in table 8. For earlier expansions, these comparisons differ from those shown for reference cycles in that they show only the period up to the next specific peak date and do not include any part of the contraction that followed. In many cases, therefore, the earlier comparisons cover fewer months than those for the current expansion.

Nearly all series have undergone changes in definition, coverage, or estimation procedure since 1919; therefore, the historical comparisons are to be considered only approximate. Furthermore, it is sometimes necessary to use data for a closely related series for cycles prior to the period covered by the series used currently. The principal substitutions of this type are as follows:

7. New private nonfarm dwelling units started (prior to 1948: Residential building contracts, floor space, by F. W. Dodge Corp.)
41. Number of employees in nonagricultural establishments (prior to 1929: Factory employment)
52. Personal income (prior to 1929: Quarterly data as published by Barger and Klein)
54. Sales of retail stores (prior to 1929: Department store sales)
62. Index of labor cost per unit of output, total manufacturing (prior to 1948: Production worker wage cost per unit).

CHARTS

Two types of charts are used to highlight the cyclical patterns of the business cycle indicators: Historical time series and cyclical comparisons.

Historical Time Series (charts 1 and 2)

These charts show cyclical fluctuations against the background of expansions and contractions in general business activity from 1948 to the current month. Shaded areas on the charts indicate periods of business cycle contractions between business cycle peak dates (beginnings of shaded areas) and business cycle trough dates (ends of shaded areas). The shading for a new contraction will be entered only after a trough has been designated.

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Cyclical Comparisons (charts 3 and 4)

These charts compare the performance of selected indicators during the current expansion with their performance during the expansion phase of previous business cycles. The usual date sequence followed in charts is disregarded, and instead the data are alined at the strategic point of the business cycle: For expansions, the reference trough (see chart 3) and specific trough (see chart 4). Thus, these comparisons facilitate judgments on the vigor of the current expansion relative to cyclical movements during the expansions of previous cycles.

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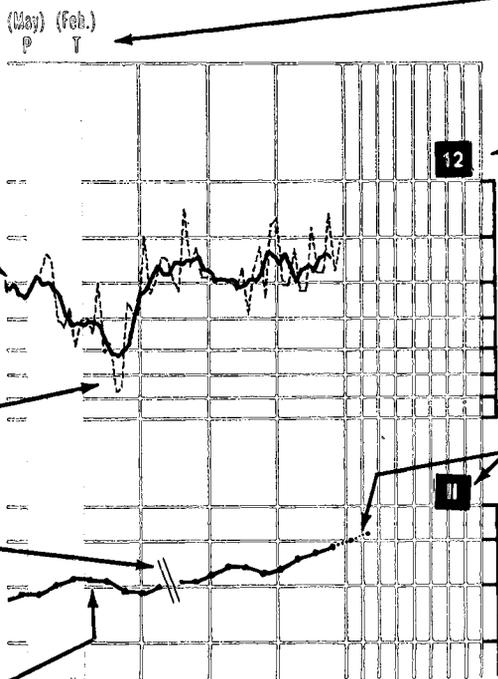
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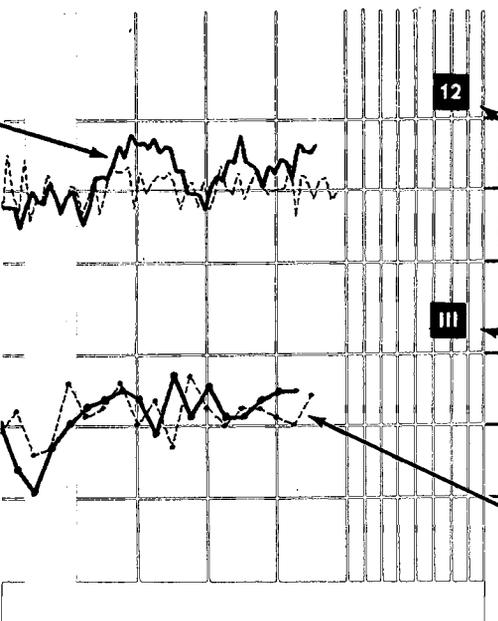
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MCD is, on average, the first span of months for which the average change for the cyclical factor is greater than that of the irregular factor and remains so. It is small for smooth series and large for irregular series. The month-to-month differences between moving averages of the period equal to MCD are commensurate with the differences between seasonally adjusted values separated by the same MCD span; thus, the month-to-month differences in a 3-month

moving average are commensurate with differences in seasonally adjusted values over 3-month spans. MCD moving averages all have about the same degree of smoothness. Consequently, MCD moving averages of highly irregular series, such as business failures and Federal cash payments, will show their cyclical movements about as clearly as the seasonally adjusted data for such smooth series as industrial production.

MCD moving averages are shown in chart 1 for all series with an MCD of "5" or more. To provide an indication of the variation about these moving averages, seasonally adjusted data are also plotted beginning with 1958. Although not so smooth as more powerful moving averages (such as the weighted 15-term Spencer curve), the MCD curve is more current and has a smaller rounding bias around business cycle peaks and troughs. On balance, the MCD curve seems to offer a reasonable compromise in terms of currency, smoothness, and fidelity to the patterns of business cycle fluctuations.

Because of advance reporting and preliminary seasonal factors, the MCD's for current data are usually larger than those computed from historical series and shown in appendix C. MCD is usually computed for a fairly long period, one covering both expansions and contractions. Since the pace of change varies from phase to phase of the business cycle, such a measure will not provide an accurate estimate of the span over which to estimate cyclically significant changes at all times. Thus, MCD computed for the period 1953-63 is likely to be too high during the early stages of recovery when expansion has usually been rapid and too low during the late stages of expansion when the rate of advance has usually been small. This limitation should be borne in mind when making use of this measure.¹

ANALYTICAL MEASURES OF CURRENT CHANGE

Three kinds of analytical measures are presented—timing distributions, diffusion indexes, and directions of change. These measures aid in forming a judgment of the 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.

¹ For a more complete description of MCD and its use in studying economic series, see *Business Cycle Indicators*, Geoffrey H. Moore, editor; National Bureau of Economic Research, Inc., vol. 1, ch. 18, "Statistics for Short-Term Economic Forecasting," by Julius Shiskin (Princeton University Press: 1961).

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. This timing distribution shows 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 presented 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 leading and roughly coincident business cycle indicators are scanned each month. During a business cycle expansion, the date of the high value for each series is recorded. (For inverted series—that is, series with negative conformity to the business cycle—dates of low values are taken.) 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 may be disregarded, although it is, of course, difficult to identify an erratic value, particularly for the current month.

The letter "H" is used in table 2 to identify and highlight the current high values during the expansion. The highs designated during the current cyclical phase will not necessarily be the specific cycle peaks. (See appendix B.) As new high levels are reached during the expansion, the current highs will be moved ahead. Comparisons of the current timing distributions with those for periods around earlier business cycle 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 simply reflect a short reversal in the upward movement.

Diffusion Indexes

Diffusion indexes are simple summary measures of groups of economic series. They express, for a given aggregate series, the percent of the series components

which have risen over given spans 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 and widespread declines with sharp reductions in aggregate activity.

The diffusion indexes in this report are grouped according to the timing classification of the NBER. For monthly series, comparisons are made over 1-month spans (January-February, February-March, etc.) and generally for either 6- or 9-month spans, depending upon the irregularity of the series. The indexes based on 1-month spans are more "current" but they are also more irregular than the 6- or 9-month indexes. (See chart 2.) Quarterly series are compared over 1-quarter spans, 3-quarter spans, and 4-quarter spans.

Recent research has shown that the longer-span diffusion indexes are not only smoother, but have systematically larger amplitudes than the 1-month indexes. The 1-month indexes generally have large irregular fluctuations, but the movements may be significant when important changes are taking place, particularly around cyclical turning points. Since the longer-span diffusion indexes are centered, there is an apparent loss in currency equal to one-half the span; for example, 3 months in the case of a 6-month diffusion index. However, the most recent figure for a 6-month or longer-span index does provide the latest available information on changes *over that span*. If a significant reversal has taken place *within that span*, the 1-month indexes are likely to reveal it. Presentation of both 1-month and longer-span diffusion indexes provides an opportunity for the user to take advantage of the best features of each in interpreting current changes.

Series numbers preceded by the letter "D" designate diffusion indexes. When one of these numbers corresponds to the number of a basic indicator series, 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 6. Diffusion indexes not computed from basic series components are assigned new numbers.

Diffusion indexes that are based on business expectations 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.

Direction-of-Change Table

The direction-of-change table (table 5) shows directions of change ("+" for rising, "o" for unchanged, and "-" for falling) in the components used for the diffusion indexes. This table provides a convenient view of changing business conditions and is helpful in making an economic interpretation of the movements in the more highly aggregated statistical measures. That is, it shows which economic activities went up, which went down, and how long such movements have persisted. The table also helps to show how a recession or recovery spreads from one sector of the economy to another.

Directions of change for most diffusion index components are shown for consecutive months and, depending upon the irregularity of the series, for either 6- or 9-month spans.

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 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 whether the current cyclical phase is an expansion or contraction.

Expansions are compared in one way by measuring changes from the immediately preceding peak levels. In table 6 of this report, data for the latest month in the current expansion (shown by number of months from the February 1961 trough) are compared with the May 1960 reference peak. For each earlier expansion, data for a like period (same number of months from the trough of the expansion) are compared with the preceding reference peak. This type of comparison is designated as changes computed *from reference peak levels and from reference trough dates*. This type of comparison shows whether, and by how much, the current level of activity exceeds or falls short of the level at the preceding business cycle peak, and how the current situation compares, in this respect, with earlier expansions. For those earlier periods of expansion that were shorter than the current one, the comparisons reflect the status at a point after a new contraction had set in.

Expansions are also compared by computing changes *from reference trough levels and from reference trough dates* (table 7). For the current expansion, this type of comparison measures the extent of the rise from the trough level (February 1961) to the

level at the current month. For each earlier expansion, data for a like period (same number of months from the trough of the expansion) are compared with the level at the trough. The same situation exists here as for the comparisons shown in table 6: For earlier expansions that were shorter than the current one, the comparisons show the status at a point after a new contraction had set in.

Contractions can be 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 changes *from reference peak levels and from reference peak dates*. These comparisons will be made during a contraction period.

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 for the index of industrial production is January 1960 (corresponding to the May 1960 reference peak); the specific peak for stock prices is July 1959. (See appendix B.) Specific cycle comparisons are shown in table 8. For earlier expansions, these comparisons differ from those shown for reference cycles in that they show only the period up to the next specific peak date and do not include any part of the contraction that followed. In many cases, therefore, the earlier comparisons cover fewer months than those for the current expansion.

Nearly all series have undergone changes in definition, coverage, or estimation procedure since 1919; therefore, the historical comparisons are to be considered only approximate. Furthermore, it is sometimes necessary to use data for a closely related series for cycles prior to the period covered by the series used currently. The principal substitutions of this type are as follows:

7. New private nonfarm dwelling units started (prior to 1948: Residential building contracts, floor space, by F. W. Dodge Corp.)
41. Number of employees in nonagricultural establishments (prior to 1929: Factory employment)
52. Personal income (prior to 1929: Quarterly data as published by Barger and Klein)
54. Sales of retail stores (prior to 1929: Department store sales)
62. Index of labor cost per unit of output, total manufacturing (prior to 1948: Production worker wage cost per unit).

CHARTS

Two types of charts are used to highlight the cyclical patterns of the business cycle indicators: Historical time series and cyclical comparisons.

Historical Time Series (charts 1 and 2)

These charts show cyclical fluctuations against the background of expansions and contractions in general business activity from 1948 to the current month. Shaded areas on the charts indicate periods of business cycle contractions between business cycle peak dates (beginnings of shaded areas) and business cycle trough dates (ends of shaded areas). The shading for a new contraction will be entered only after a trough has been designated.

Several different ratio and arithmetic scales are used to highlight the cyclical movements of the various series. The scale selected for each series is identified in the margin of the chart. Rates of change of various series can be compared with each other only where scales are identical. See the diagram, page 6, for additional help in using these charts.

Cyclical Comparisons (charts 3 and 4)

These charts compare the performance of selected indicators during the current expansion with their performance during the expansion phase of previous business cycles. The usual date sequence followed in charts is disregarded, and instead the data are alined at the strategic point of the business cycle: For expansions, the reference trough (see chart 3) and specific trough (see chart 4). Thus, these comparisons facilitate judgments on the vigor of the current expansion relative to cyclical movements during the expansions of previous cycles.

Two types of cyclical comparisons are made. Chart 3 compares the pattern of the current *reference cycle* (the cycle for aggregate economic activity) with movements over the corresponding phases of previous reference cycles. Chart 4 compares the pattern of the current *specific cycle* (the cycle for a particular series) with the movements over the corresponding phases of previous specific cycles in that series. In both charts, the trough dates are alined. In chart 3, the levels of the preceding peaks are also alined while in chart 4, the levels of the troughs are alined. See the section, "Comparisons of Cyclical Patterns", for more detailed descriptions of these comparisons.

HOW TO READ CHARTS AND FIGURES

Peak (P) of cycle indicates end of expansion and beginning of Recession (shaded areas) as designated by NBER.

See back cover for complete titles and sources of series.

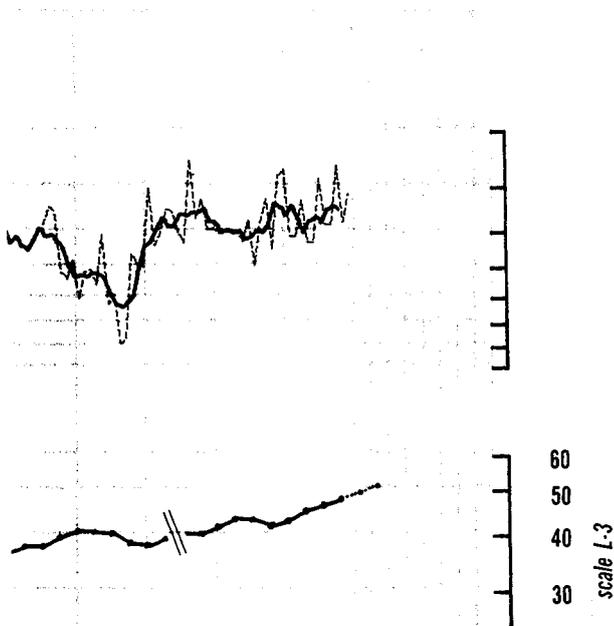
Solid line indicates monthly data. (Data may be actual monthly figures or MCD moving averages.*)

Broken line indicates actual monthly data for series where an MCD moving average * is plotted.

Parallel lines indicate a break in continuity (data not available, changes in series definitions, extreme values, etc.)

Solid line with plotting points indicates quarterly data.

CHART 1 — Business Cycle Series



Trough (T) of cycle indicates end of recession and beginning of Expansion (white areas) as designated by NBER.

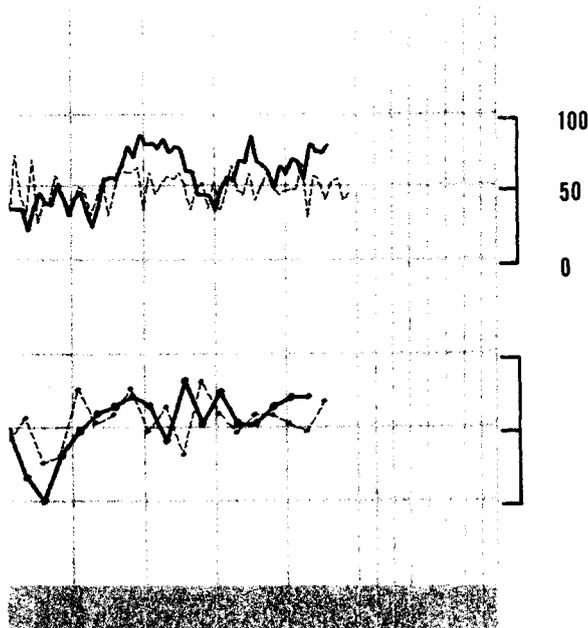
Arabic number indicates latest month for which data are plotted. ("12" = December)

Roman number indicates latest quarter for which data are plotted. ("II" = second quarter)

Dotted line indicates anticipated data.

Various scales are used to highlight the patterns of the individual series. Series plotted to different scales are not directly comparable. "Scale A" is an arithmetic scale, "scale L-1" is a logarithmic scale with 1 cycle in a given distance, "scale L-2" is a logarithmic scale with 2 cycles in that distance, etc.

CHART 2 — Diffusion Indexes



Solid line indicates monthly data over 6- or 9-month spans.

Broken line indicates monthly data over 1-month spans.

Solid line with plotting points indicates quarterly data over various spans.

* Many of the more irregular series are shown in terms of their MCD moving averages as well as their actual monthly data. In such cases, the 4-, 5-, or 6-term moving averages are plotted 1½, 2, or 2½ months, respectively, behind the actual data. See page 2 for a description of MCD moving averages.

Scale shows percent of components rising.

Arabic number indicates latest month for which data are used in computing the indexes. ("12" = December)

Roman number indicates latest quarter for which data are used in computing the indexes. ("III" = third quarter)

Broken line with plotting points indicates quarterly data over various intervals. This line is also used to indicate anticipated quarterly data.

DESCRIPTIONS AND PROCEDURES

INTRODUCTION

Students of economic conditions describe the business cycle as consisting of alternating periods of expansion and contraction in production, employment, income, money flows, prices, and other economic processes. The fluctuations take place in a concerted manner, but not simultaneously. Once an expansion gets underway, it spreads from firm to firm, from industry to industry, from area to area, and from process to process, cumulating until a cyclical peak in aggregate activity is reached. Even while expansion is widespread during the upward phase of the business cycle, some activities continue to move in the opposite direction. Declines begin to spread as the expansion nears its peak and continue to spread even faster after the peak has been passed. But some activities continue to expand during the general contraction. Before long these expansions become stronger and more widespread. When they begin to dominate the situation, the upturn in aggregate activity has arrived and a new expansion is underway. This sequence is recurrent, but not periodic.

The causal relations among these various economic processes are primarily responsible for the cumulative nature of cyclical forces, and explain why expansion eventually turns into recession and recession into expansion. Cyclical fluctuations in production and employment are preceded by fluctuations in measures which relate to future rather than to current production—measures such as new orders for durable goods, the formation of new business enterprises, and accessions to payrolls. They are followed by fluctuations in various types of economic costs, such as labor costs, interest rates, fulfillment of long-term commitments, and holdings of inventories and of debts.

Although this pattern has been characteristic of American economic history, today many economists do not consider it inevitable.

Intensive research by the National Bureau of Economic Research (NBER) over many years has provided a list of those significant series that usually lead, those that usually move with, and those that usually lag behind cyclical movements in aggregate economic ac-

tivity. The series have been grouped and classified by the NBER as "leading", "roughly coincident", or "lagging" indicators. These indicators are defined as follows:

- ▶ *NBER Leading Indicators.*—Series that usually reach peaks or troughs before those in aggregate economic activity as measured by the roughly coincident series (see below). One group of these series pertains to activities in the labor market, another to orders and contracts, and so on.
- ▶ *NBER Roughly Coincident Indicators.*—Series that are direct measures of aggregate economic activity or move roughly together with it; for example, nonagricultural employment, industrial production, and retail sales.
- ▶ *NBER Lagging Indicators.*—Series, such as new plant and equipment expenditures and manufacturers' inventories, that usually reach turning points after they are reached in aggregate economic activity.

Other U.S. series with business cycle significance are included in this report. 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.

The list of series covered and sources of the basic data are shown on the back cover of this report. Series numbers are for identification only and do not reflect series relationships or order.

METHOD OF PRESENTATION

Data are shown in this report in three general categories, as follows:

- ▶ *Basic Data* (chart 1 and tables 1 and 2).—Data are shown for business cycle indicators, additional

U.S. series with business cycle significance, and industrial production indexes for selected countries. 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* (chart 2 and tables 3 to 5).— These are measures that aid in forming a judgment of the imminence of a turning point in the business cycle, determining the extent of current changes in different parts of the economy, and pointing to developments in particular industries and places.
- ▶ *Cyclical Patterns* (chart 3 and tables 6 and 7).— Current cyclical levels are compared with levels 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.

DESIGNATION OF BUSINESS CYCLE TURNING POINTS

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

Monthly business cycle peaks and troughs have been dated by the NBER for the period 1854-1961. Over this span, expansion has prevailed 61 percent of the time and contraction, 39 percent. If war periods are disregarded, expansion has prevailed 56 percent of the time and contraction, 44 percent.

SEASONAL AND RELATED STATISTICAL ADJUSTMENTS

Adjustments for normal seasonal fluctuations are often necessary to bring out the underlying cyclical trends of a series. Such adjustments allow for periodic intra-year variations resulting chiefly from normal differences in weather conditions during the year and from various institutional arrangements. Some series contain considerable variation attributable to the number of working or trading days in each month. An additional adjustment is necessary in such cases to reduce this variation. Variations due to holidays are usually accounted for by the seasonal adjustment process; how-

ever, there are some cases in which a separate holiday adjustment is necessary for holidays with variable dates. Such a case is retail sales of apparel which is affected strongly by the date of Easter and, to a lesser degree, by the dates of Labor Day and Thanksgiving.

In general, the seasonal adjustment process is designed to adjust for *average* weather conditions but not for the dispersion about that average. Thus, some seasonally adjusted series, such as housing starts, will tend to be low in months of unusually bad weather and high during unusually good weather. At the Bureau of the Census, studies have been started on some series to determine the effects of abnormal weather. Although it eventually may be possible, Census methods do not at present make any adjustments for such variations.

Most of the series contained in this report are presented in seasonally adjusted form. Unadjusted data are used only for those series which appear to have no pattern of seasonal variation. (Unadjusted series are identified in table 2.) In most cases, the seasonally adjusted data used for a series are the official figures released by the source agency; therefore, several different methods of seasonal adjustment are involved. In addition, 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. For these series, seasonal adjustments have been developed by either the NBER or the Census Bureau. The adjustment factors for these series, derived by Census Method II, are shown in appendix D. Factors for series which are the sums of seasonally adjusted components or which are based on unpublished source data are not shown.

MCD MOVING AVERAGES

MCD (months for cyclical dominance) is an estimate of the appropriate span over which to observe the cyclical movements in a monthly series. This span is usually longer than a single month because month-to-month changes are often dominated by erratic movements, but shorter than the frequently used 12-month span (change from the same month a year ago), and is different for different series (see appendix C for MCD values and method of computation).

MCD is, on average, the first span of months for which the average change for the cyclical factor is greater than that of the irregular factor and remains so. It is small for smooth series and large for irregular series. The month-to-month differences between moving averages of the period equal to MCD are commensurate with the differences between seasonally

adjusted values separated by the same MCD span; thus, the month-to-month differences in a 3-month moving average are commensurate with differences in seasonally adjusted values over 3-month spans. MCD moving averages all have about the same degree of smoothness. Consequently, MCD moving averages of highly irregular series, such as business failures and Federal cash payments, will show their cyclical movements about as clearly as the seasonally adjusted data for such smooth series as industrial production.

MCD moving averages are shown in chart 1 for all series with an MCD of "5" or more. To provide an indication of the variation about these moving averages, seasonally adjusted data are also plotted beginning with 1958. Although not so smooth as more powerful moving averages (such as the weighted 13-term Henderson curve), the MCD curve is more current and has a smaller rounding bias around business cycle peaks and troughs. On balance, the MCD curve seems to offer a reasonable compromise in terms of currency, smoothness, and fidelity to the patterns of business cycle fluctuations.

Because of advance reporting and preliminary seasonal factors, the MCD's for current data are usually larger than those computed from historical series and shown in appendix C. MCD is usually computed for a fairly long period, one covering both expansions and contractions. Since the pace of change varies from phase to phase of the business cycle, such a measure will not provide an accurate estimate of the span over which to estimate cyclically significant changes at all times. Thus, MCD computed for the period 1953-63 is likely to be too high during the early stages of recovery when expansion has usually been rapid and too low during the late stages of expansion when the rate of advance has usually been small. This limitation should be borne in mind when making use of this measure.¹

ANALYTICAL MEASURES OF CURRENT CHANGE

Three kinds of analytical measures are presented—timing distributions, diffusion indexes, and directions of change. These measures aid in forming a judgment of the 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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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. This timing distribution shows 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 presented 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 leading and roughly coincident business cycle indicators are scanned each month. During a business cycle expansion, the date of the high value for each series is recorded. (For inverted series—that is, series with negative conformity to the business cycle—dates of low values are taken.) 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 may be disregarded, although it is, of course, difficult to identify an erratic value, particularly for the current month.

The letter "H" is used in table 2 to identify and highlight the current high values during the expansion. The highs designated during the current cyclical phase will not necessarily be the specific cycle peaks. (See appendix B.) As new high levels are reached during the expansion, the current highs will be moved ahead. Comparisons of the current timing distributions with those for periods around earlier business cycle 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 simply reflect a short reversal in the upward movement.

Diffusion Indexes

Diffusion indexes are simple summary measures of groups of economic series. They express, for a given aggregate series, the percent of the series components

which have risen over given spans 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 and widespread declines with sharp reductions in aggregate activity.

The diffusion indexes in this report are grouped according to the timing classification of the NBER. For monthly series, comparisons are made over 1-month spans (January-February, February-March, etc.) and generally for either 6- or 9-month spans, depending upon the irregularity of the series. The indexes based on 1-month spans are more "current" but they are also more irregular than the 6- or 9-month indexes. (See chart 2.) Quarterly series are compared over 1-quarter spans, 3-quarter spans, and 4-quarter spans.

Recent research has shown that the longer-span diffusion indexes are not only smoother, but have systematically larger amplitudes than the 1-month indexes. The 1-month indexes generally have large irregular fluctuations, but the movements may be significant when important changes are taking place, particularly around cyclical turning points. Since the longer-span diffusion indexes are centered, there is an apparent loss in currency equal to one-half the span; for example, 3 months in the case of a 6-month diffusion index. However, the most recent figure for a 6-month or longer-span index does provide the latest available information on changes *over that span*. If a significant reversal has taken place *within that span*, the 1-month indexes are likely to reveal it. Presentation of both 1-month and longer-span diffusion indexes provides an opportunity for the user to take advantage of the best features of each in interpreting current changes.

Series numbers preceded by the letter "D" designate diffusion indexes. When one of these numbers corresponds to the number of a basic indicator series, 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 6. Diffusion indexes not computed from basic series components are assigned new numbers.

Diffusion indexes that are based on business expectations 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-Index Components

Many of the component series used to make up the diffusion indexes are shown in table 5. Where possible, recent basic data for the components are shown in part A. In part B, directions of change in these components are indicated for consecutive months and, depending upon the irregularity of the diffusion index, for either 6- or 9-month spans. The directions of change are indicated by "+" for rising, "o" for unchanged, and "-" for falling. (In counting the number of components rising, a "o" is counted as one-half.)

This table provides a convenient view of changing business conditions and is helpful in making an economic interpretation of the movements in the more highly aggregated statistical measures. That is, it shows which economic activities went up, which went down, and how long such movements have persisted. The table also helps 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 various series 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 whether the current cyclical phase is an expansion or contraction.

Expansions are compared in one way by measuring changes from the immediately preceding peak levels. In table 6 of this report, data for the latest month in the current expansion (shown by number of months from the February 1961 trough) are compared with the May 1960 reference peak. For each earlier expansion, data for a like period (same number of months from the trough of the expansion) are compared with the preceding reference peak. This type of comparison is designated as changes computed *from reference peak levels and reference trough dates*. This type of comparison shows whether, and by how much, the current level of activity exceeds or falls short of the level at the preceding business cycle peak, and how the current situation compares, in this respect, with earlier expansions. For those earlier periods of expansion that were shorter than the current one, the comparisons reflect the status at a point after a new contraction had set in.

Expansions are also compared by computing changes *from reference trough levels and reference trough dates* (table 7). For the current expansion, this type of comparison measures the extent of the rise from the trough level (February 1961) to the level at the current month. For each earlier expansion, data for a like period (same number of months from the trough of the expansion) are compared with the level at the trough. The same situation exists here as for the comparisons shown in table 6: For earlier expansions that were shorter than the current one, the comparisons show the status at a point after a new contraction had set in.

Contractions can be 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 changes *from reference peak levels and reference peak dates*. These comparisons will be made during a contraction period.

In addition to comparing cyclical fluctuations on the basis of reference dates, which are the same for all series, similar comparisons may be made using the specific peak and trough dates identified for each series. (Appendix B lists specific dates for a selected group of series.) Such comparisons would be based on changes *from specific peak levels and specific trough dates* and on changes *from specific trough levels and specific trough dates*. Although these specific cycle comparisons are not currently included in this report, they have been shown in previous issues.

Nearly all series have undergone changes in definition, coverage, or estimation procedure since 1919; therefore, the historical comparisons are to be considered only approximate. Furthermore, it is sometimes necessary to use data for a closely related series for cycles prior to the period covered by the series used currently. The principal substitutions of this type are as follows:

7. New private nonfarm dwelling units started (prior to 1948: Residential building contracts, floor space, by F. W. Dodge Corp.)
41. Number of employees in nonagricultural establishments (prior to 1929: Factory employment)
52. Personal income (prior to 1929: Quarterly data as published by Barger and Klein)
54. Sales of retail stores (prior to 1929: Department store sales)
62. Index of labor cost per unit of output, total manufacturing (prior to 1948: Production worker wage cost per unit).

CHARTS

Two types of charts are used to highlight the cyclical patterns of the business cycle series: Historical time series and cyclical comparisons.

Historical Time Series (charts 1 and 2)

These charts show cyclical fluctuations against the background of expansions and contractions in general business activity from 1948 to the current month. Shaded areas on the charts indicate periods of business cycle contractions between business cycle peak dates (beginnings of shaded areas) and business cycle trough dates (ends of shaded areas). The shading for a new contraction will be entered only after a trough has been designated.

Several different ratio and arithmetic scales are used to highlight the cyclical movements of the various series. The scale selected for each series is identified in the margin of the chart. Rates of change of various series can be compared with each other only where scales are identical. See the diagram, page 6, for additional help in using these charts.

Cyclical Comparisons (chart 3)

This chart compares the movements of selected series during the current business cycle with their movements through the corresponding phases of previous business cycles. Actually, it is an extension of the concept behind table 6. While table 6 makes a comparison at one point in time, chart 3 shows these comparisons over the course of the whole business cycle. These comparisons facilitate judgments on the vigor of the current expansion relative to behavior during the expansions of earlier cycles.

Instead of following the usual date sequence, as in charts 1 and 2, the data in this chart are alined according to the strategic points of the business cycle. Each of the included series is separated into four segments which encompass the three complete business cycles since 1948 and the current expansion. These segments are alined so that the trough dates all fall at the same point on the horizontal scale and so that the levels of the preceding peaks all fall at the same point on the vertical scale.

A similar chart, based on specific cycle dates, was previously included in this report but has been discontinued for the present.

CHART 1 – Business Cycle Series

Peak (P) of cycle indicates end of expansion and beginning of Recession (shaded areas) as designated by NBER.

Trough (T) of cycle indicates end of recession and beginning of Expansion (white areas) as designated by NBER.

See **back cover** for complete titles and sources of series.

Arabic number indicates latest month for which data are plotted. ("12" = December)

Solid line indicates monthly data. (Data may be actual monthly figures or MCD moving averages.*)

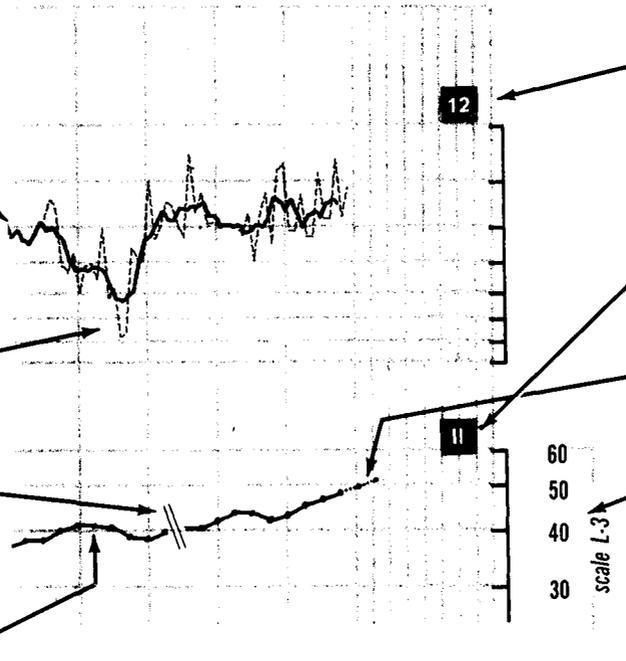
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Broken line indicates actual monthly data for series where an MCD moving average* is plotted.

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Parallel lines indicate a break in continuity (data not available, changes in series definitions, extreme values, etc.)

Solid line with plotting points indicates quarterly data.



Various scales are used to highlight the patterns of the individual series. Series plotted to different scales are not directly comparable. "Scale A" is an arithmetic scale, "scale L-1" is a logarithmic scale with 1 cycle in a given distance, "scale L-2" is a logarithmic scale with 2 cycles in that distance, etc.

CHART 2 – Diffusion Indexes

Solid line indicates monthly data over 6- or 9-month spans.

Scale shows percent of components rising.

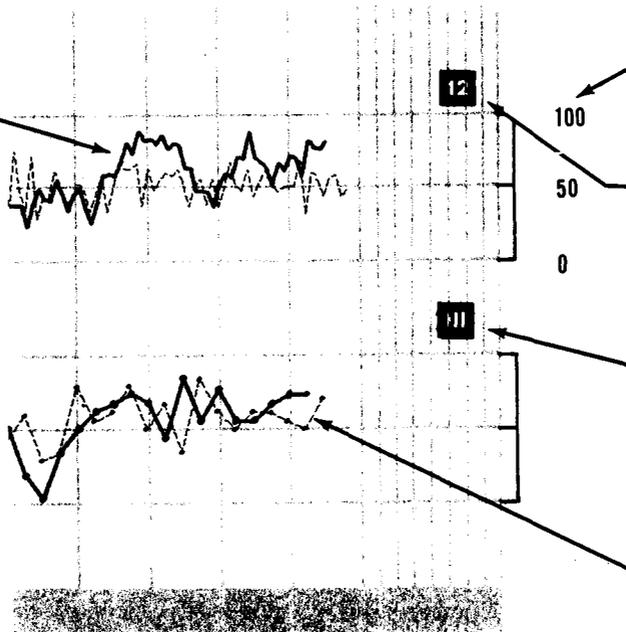
Broken line indicates monthly data over 1-month spans.

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* Many of the more irregular series are shown in terms of their MCD moving averages as well as their actual monthly data. In such cases, the 4-, 5-, or 6-term moving averages are plotted 1½, 2, or 2½ months, respectively, behind the actual data. See page 2 for a description of MCD moving averages.



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DESCRIPTIONS AND PROCEDURES

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The causal relations among these various economic processes are primarily responsible for the cumulative nature of cyclical forces, and explain why expansion eventually turns into recession and recession into expansion. Cyclical fluctuations in production and employment are preceded by fluctuations in measures which relate to future rather than to current production—measures such as new orders for durable goods, the formation of new business enterprises, and accessions to payrolls. They are followed by fluctuations in various types of economic costs, such as labor costs, interest rates, fulfillment of long-term commitments, and holdings of inventories and of debts.

Although this pattern has been characteristic of American economic history, today many economists do not consider it inevitable.

Intensive research by the National Bureau of Economic Research (NBER) over many years has provided a list of those significant series that usually lead, those that usually move with, and those that usually lag behind cyclical movements in aggregate economic ac-

tivity. The series have been grouped and classified by the NBER as “leading”, “roughly coincident”, or “lagging” indicators. These indicators are defined as follows:

- *NBER Leading Indicators.*—Series that usually reach peaks or troughs before those in aggregate economic activity as measured by the roughly coincident series (see below). One group of these series pertains to activities in the labor market, another to orders and contracts, and so on.
- *NBER Roughly Coincident Indicators.*—Series that are direct measures of aggregate economic activity or move roughly together with it; for example, nonagricultural employment, industrial production, and retail sales.
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- ▶ *Analytical Measures* (chart 2 and tables 3 to 5).— These are measures that aid in forming a judgment of the imminence of a turning point in the business cycle, determining the extent of current changes in different parts of the economy, and pointing to developments in particular industries and places.
- ▶ *Cyclical Patterns* (chart 3 and tables 6 and 7).— Current cyclical levels are compared with levels 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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Monthly business cycle peaks and troughs have been dated by the NBER for the period 1854-1961. Over this span, expansion has prevailed 61 percent of the time and contraction, 39 percent. If war periods are disregarded, expansion has prevailed 56 percent of the time and contraction, 44 percent.

SEASONAL AND RELATED STATISTICAL ADJUSTMENTS

Adjustments for normal seasonal fluctuations are often necessary to bring out the underlying cyclical trends of a series. Such adjustments allow for periodic intra-year variations resulting chiefly from normal differences in weather conditions during the year and from various institutional arrangements. Some series contain considerable variation attributable to the number of working or trading days in each month. An additional adjustment is necessary in such cases to reduce this variation. Variations due to holidays are usually accounted for by the seasonal adjustment process; how-

ever, there are some cases in which a separate holiday adjustment is necessary for holidays with variable dates. Such a case is retail sales of apparel which is affected strongly by the date of Easter and, to a lesser degree, by the dates of Labor Day and Thanksgiving.

In general, the seasonal adjustment process is designed to adjust for *average* weather conditions but not for the dispersion about that average. Thus, some seasonally adjusted series, such as housing starts, will tend to be low in months of unusually bad weather and high during unusually good weather. At the Bureau of the Census, studies have been started on some series to determine the effects of abnormal weather. Although it eventually may be possible, Census methods do not at present make any adjustments for such variations.

Most of the series contained in this report are presented in seasonally adjusted form. Unadjusted data are used only for those series which appear to have no pattern of seasonal variation. (Unadjusted series are identified in table 2.) In most cases, the seasonally adjusted data used for a series are the official figures released by the source agency; therefore, several different methods of seasonal adjustment are involved. In addition, 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. For these series, seasonal adjustments have been developed by either the NBER or the Census Bureau. The adjustment factors for these series, derived by Census Method II, are shown in appendix D. Factors for series which are the sums of seasonally adjusted components or which are based on unpublished source data are not shown.

MCD MOVING AVERAGES

MCD (months for cyclical dominance) is an estimate of the appropriate span over which to observe the cyclical movements in a monthly series. This span is usually longer than a single month because month-to-month changes are often dominated by erratic movements, but shorter than the frequently used 12-month span (change from the same month a year ago), and is different for different series (see appendix C for MCD values and method of computation).

MCD is, on average, the first span of months for which the average change for the cyclical factor is greater than that of the irregular factor and remains so. It is small for smooth series and large for irregular series. The month-to-month differences between moving averages of the period equal to MCD are commensurate with the differences between seasonally

adjusted values separated by the same MCD span; thus, the month-to-month differences in a 3-month moving average are commensurate with differences in seasonally adjusted values over 3-month spans. MCD moving averages all have about the same degree of smoothness. Consequently, MCD moving averages of highly irregular series, such as business failures and Federal cash payments, will show their cyclical movements about as clearly as the seasonally adjusted data for such smooth series as industrial production.

MCD moving averages are shown in chart 1 for all series with an MCD of "5" or more. To provide an indication of the variation about these moving averages, seasonally adjusted data are also plotted beginning with 1958. Although not so smooth as more powerful moving averages (such as the weighted 13-term Henderson curve), the MCD curve is more current and has a smaller rounding bias around business cycle peaks and troughs. On balance, the MCD curve seems to offer a reasonable compromise in terms of currency, smoothness, and fidelity to the patterns of business cycle fluctuations.

Because of advance reporting and preliminary seasonal factors, the MCD's for current data are usually larger than those computed from historical series and shown in appendix C. MCD is usually computed for a fairly long period, one covering both expansions and contractions. Since the pace of change varies from phase to phase of the business cycle, such a measure will not provide an accurate estimate of the span over which to estimate cyclically significant changes at all times. Thus, MCD computed for the period 1953-63 is likely to be too high during the early stages of recovery when expansion has usually been rapid and too low during the late stages of expansion when the rate of advance has usually been small. This limitation should be borne in mind when making use of this measure.¹

ANALYTICAL MEASURES OF CURRENT CHANGE

Three kinds of analytical measures are presented—timing distributions, diffusion indexes, and directions of change. These measures aid in forming a judgment of the 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.

¹ For a more complete description of MCD and its use in studying economic series, see *Business Cycle Indicators*, Geoffrey H. Moore, editor; National Bureau of Economic Research, Inc., vol. 1, ch. 18, "Statistics for Short-Term Economic Forecasting," by Julius Shiskin (Princeton University Press: 1961).

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. This timing distribution shows 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 presented 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 leading and roughly coincident business cycle indicators are scanned each month. During a business cycle expansion, the date of the high value for each series is recorded. (For inverted series—that is, series with negative conformity to the business cycle—dates of low values are taken.) 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 may be disregarded, although it is, of course, difficult to identify an erratic value, particularly for the current month.

The letter "H" is used in table 2 to identify and highlight the current high values during the expansion. The highs designated during the current cyclical phase will not necessarily be the specific cycle peaks. (See appendix B.) As new high levels are reached during the expansion, the current highs will be moved ahead. Comparisons of the current timing distributions with those for periods around earlier business cycle 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 simply reflect a short reversal in the upward movement.

Diffusion Indexes

Diffusion indexes are simple summary measures of groups of economic series. They express, for a given aggregate series, the percent of the series components

which have risen over given spans 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 and widespread declines with sharp reductions in aggregate activity.

The diffusion indexes in this report are grouped according to the timing classification of the NBER. For monthly series, comparisons are made over 1-month spans (January-February, February-March, etc.) and generally for either 6- or 9-month spans, depending upon the irregularity of the series. The indexes based on 1-month spans are more "current" but they are also more irregular than the 6- or 9-month indexes. (See chart 2.) Quarterly series are compared over 1-quarter spans, 3-quarter spans, and 4-quarter spans.

Recent research has shown that the longer-span diffusion indexes are not only smoother, but have systematically larger amplitudes than the 1-month indexes. The 1-month indexes generally have large irregular fluctuations, but the movements may be significant when important changes are taking place, particularly around cyclical turning points. Since the longer-span diffusion indexes are centered, there is an apparent loss in currency equal to one-half the span; for example, 3 months in the case of a 6-month diffusion index. However, the most recent figure for a 6-month or longer-span index does provide the latest available information on changes *over that span*. If a significant reversal has taken place *within that span*, the 1-month indexes are likely to reveal it. Presentation of both 1-month and longer-span diffusion indexes provides an opportunity for the user to take advantage of the best features of each in interpreting current changes.

Series numbers preceded by the letter "D" designate diffusion indexes. When one of these numbers corresponds to the number of a basic indicator series, 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 6. Diffusion indexes not computed from basic series components are assigned new numbers.

Diffusion indexes that are based on business expectations 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-Index Components

Many of the component series used to make up the diffusion indexes are shown in table 5. Where possible, recent basic data for the components are shown in part A. In part B, directions of change in these components are indicated for consecutive months and, depending upon the irregularity of the diffusion index, for either 6- or 9-month spans. The directions of change are indicated by "+" for rising, "o" for unchanged, and "-" for falling. (In counting the number of components rising, a "o" is counted as one-half.)

This table provides a convenient view of changing business conditions and is helpful in making an economic interpretation of the movements in the more highly aggregated statistical measures. That is, it shows which economic activities went up, which went down, and how long such movements have persisted. The table also helps 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 various series 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 whether the current cyclical phase is an expansion or contraction.

Expansions are compared in one way by measuring changes from the immediately preceding peak levels. In table 6 of this report, data for the latest month in the current expansion (shown by number of months from the February 1961 trough) are compared with the May 1960 reference peak. For each earlier expansion, data for a like period (same number of months from the trough of the expansion) are compared with the preceding reference peak. This type of comparison is designated as changes computed *from reference peak levels and reference trough dates*. This type of comparison shows whether, and by how much, the current level of activity exceeds or falls short of the level at the preceding business cycle peak, and how the current situation compares, in this respect, with earlier expansions. For those earlier periods of expansion that were shorter than the current one, the comparisons reflect the status at a point after a new contraction had set in.

Expansions are also compared by computing changes from reference trough levels and reference trough dates (table 7). For the current expansion, this type of comparison measures the extent of the rise from the trough level (February 1961) to the level at the current month. For each earlier expansion, data for a like period (same number of months from the trough of the expansion) are compared with the level at the trough. The same situation exists here as for the comparisons shown in table 6: For earlier expansions that were shorter than the current one, the comparisons show the status at a point after a new contraction had set in.

Contractions can be 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 changes from reference peak levels and reference peak dates. These comparisons will be made during a contraction period.

In addition to comparing cyclical fluctuations on the basis of reference dates, which are the same for all series, similar comparisons may be made using the specific peak and trough dates identified for each series. (Appendix B lists specific dates for a selected group of series.) Such comparisons would be based on changes from specific peak levels and specific trough dates and on changes from specific trough levels and specific trough dates. Although these specific cycle comparisons are not currently included in this report, they have been shown in previous issues.

Nearly all series have undergone changes in definition, coverage, or estimation procedure since 1919; therefore, the historical comparisons are to be considered only approximate. Furthermore, it is sometimes necessary to use data for a closely related series for cycles prior to the period covered by the series used currently. The principal substitutions of this type are as follows:

7. New private nonfarm dwelling units started (prior to 1948: Residential building contracts, floor space, by F. W. Dodge Corp.)
41. Number of employees in nonagricultural establishments (prior to 1929: Factory employment)
52. Personal income (prior to 1929: Quarterly data as published by Barger and Klein)
54. Sales of retail stores (prior to 1929: Department store sales)
62. Index of labor cost per unit of output, total manufacturing (prior to 1948: Production worker wage cost per unit).

Two types of charts are used to highlight the cyclical patterns of the business cycle series: Historical time series and cyclical comparisons.

Historical Time Series (charts 1 and 2)

These charts show cyclical fluctuations against the background of expansions and contractions in general business activity from 1948 to the current month. Shaded areas on the charts indicate periods of business cycle contractions between business cycle peak dates (beginnings of shaded areas) and business cycle trough dates (ends of shaded areas). The shading for a new contraction will be entered only after a trough has been designated.

Several different ratio and arithmetic scales are used to highlight the cyclical movements of the various series. The scale selected for each series is identified in the margin of the chart. Rates of change of various series can be compared with each other only where scales are identical. See the diagram, page 6, for additional help in using these charts.

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Peak (P) of cycle indicates end of expansion and beginning of Recession (shaded areas) as designated by NBER.

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Trough (T) of cycle indicates end of recession and beginning of Expansion (white areas) as designated by NBER.

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Solid line indicates monthly data. (Data may be actual monthly figures or MCD moving averages.*)

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MCD moving averages are shown in chart 1 for all series with an MCD of "5" or more. To provide an indication of the variation about these moving averages, seasonally adjusted data are also plotted beginning with 1958. Although not so smooth as more powerful moving averages (such as the weighted 13-term Henderson curve), the MCD curve is more current and has a smaller rounding bias around business cycle peaks and troughs. On balance, the MCD curve seems to offer a reasonable compromise in terms of currency, smoothness, and fidelity to the patterns of business cycle fluctuations.

Because of advance reporting and preliminary seasonal factors, the MCD's for current data are usually larger than those computed from historical series and shown in appendix C. MCD is usually computed for a fairly long period, one covering both expansions and contractions. Since the pace of change varies from phase to phase of the business cycle, such a measure will not provide an accurate estimate of the span over which to estimate cyclically significant changes at all times. Thus, MCD computed for the period 1953-63 is likely to be too high during the early stages of recovery when expansion has usually been rapid and too low during the late stages of expansion when the rate of advance has usually been small. This limitation should be borne in mind when making use of this measure.¹

ANALYTICAL MEASURES OF CURRENT CHANGE

Three kinds of analytical measures are presented—timing distributions, diffusion indexes, and directions of change. These measures aid in forming a judgment of the 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.

¹ For a more complete description of MCD and its use in studying economic series, see *Business Cycle Indicators*, Geoffrey H. Moore, editor; National Bureau of Economic Research, Inc., vol. 1, ch. 18, "Statistics for Short-Term Economic Forecasting," by Julius Shiskin (Princeton University Press: 1961).

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. This timing distribution shows 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 presented 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 leading and roughly coincident business cycle indicators are scanned each month. During a business cycle expansion, the date of the high value for each series is recorded. (For inverted series—that is, series with negative conformity to the business cycle—dates of low values are taken.) 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 may be disregarded, although it is, of course, difficult to identify an erratic value, particularly for the current month.

The letter "H" is used in table 2 to identify and highlight the current high values during the expansion. The highs designated during the current cyclical phase will not necessarily be the specific cycle peaks. (See appendix B.) As new high levels are reached during the expansion, the current highs will be moved ahead. Comparisons of the current timing distributions with those for periods around earlier business cycle 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 simply reflect a short reversal in the upward movement.

Diffusion Indexes

Diffusion indexes are simple summary measures of groups of economic series. They express, for a given aggregate series, the percent of the series components

which have risen over given spans 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 and widespread declines with sharp reductions in aggregate activity.

The diffusion indexes in this report are grouped according to the timing classification of the NBER. For monthly series, comparisons are made over 1-month spans (January-February, February-March, etc.) and generally for either 6- or 9-month spans, depending upon the irregularity of the series. The indexes based on 1-month spans are more "current" but they are also more irregular than the 6- or 9-month indexes. (See chart 2.) Quarterly series are compared over 1-quarter spans, 3-quarter spans, and 4-quarter spans.

Recent research has shown that the longer-span diffusion indexes are not only smoother, but have systematically larger amplitudes than the 1-month indexes. The 1-month indexes generally have large irregular fluctuations, but the movements may be significant when important changes are taking place, particularly around cyclical turning points. Since the longer-span diffusion indexes are centered, there is an apparent loss in currency equal to one-half the span; for example, 3 months in the case of a 6-month diffusion index. However, the most recent figure for a 6-month or longer-span index does provide the latest available information on changes *over that span*. If a significant reversal has taken place *within that span*, the 1-month indexes are likely to reveal it. Presentation of both 1-month and longer-span diffusion indexes provides an opportunity for the user to take advantage of the best features of each in interpreting current changes.

Series numbers preceded by the letter "D" designate diffusion indexes. When one of these numbers corresponds to the number of a basic indicator series, 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 6. Diffusion indexes not computed from basic series components are assigned new numbers.

Diffusion indexes that are based on business expectations 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-Index Components

Many of the component series used to make up the diffusion indexes are shown in table 5. Where possible, recent basic data for the components are shown in part A. In part B, directions of change in these components are indicated for consecutive months and, depending upon the irregularity of the diffusion index, for either 6- or 9-month spans. The directions of change are indicated by "+" for rising, "o" for unchanged, and "-" for falling. (In counting the number of components rising, a "o" is counted as one-half.)

This table provides a convenient view of changing business conditions and is helpful in making an economic interpretation of the movements in the more highly aggregated statistical measures. That is, it shows which economic activities went up, which went down, and how long such movements have persisted. The table also helps 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 various series 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 whether the current cyclical phase is an expansion or contraction.

Expansions are compared in one way by measuring changes from the immediately preceding peak levels. In table 6 of this report, data for the latest month in the current expansion (shown by number of months from the February 1961 trough) are compared with the May 1960 reference peak. For each earlier expansion, data for a like period (same number of months from the trough of the expansion) are compared with the preceding reference peak. This type of comparison is designated as changes computed *from reference peak levels and reference trough dates*. This type of comparison shows whether, and by how much, the current level of activity exceeds or falls short of the level at the preceding business cycle peak, and how the current situation compares, in this respect, with earlier expansions. For those earlier periods of expansion that were shorter than the current one, the comparisons reflect the status at a point after a new contraction had set in.

Expansions are also compared by computing changes from *reference trough levels and reference trough dates* (table 7). For the current expansion, this type of comparison measures the extent of the rise from the trough level (February 1961) to the level at the current month. For each earlier expansion, data for a like period (same number of months from the trough of the expansion) are compared with the level at the trough. The same situation exists here as for the comparisons shown in table 6: For earlier expansions that were shorter than the current one, the comparisons show the status at a point after a new contraction had set in.

Contractions can be 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 changes from *reference peak levels and reference peak dates*. These comparisons will be made during a contraction period.

In addition to comparing cyclical fluctuations on the basis of reference dates, which are the same for all series, similar comparisons may be made using the specific peak and trough dates identified for each series. (Appendix B lists specific dates for a selected group of series.) Such comparisons would be based on changes from *specific peak levels and specific trough dates* and on changes from *specific trough levels and specific trough dates*. Although these specific cycle comparisons are not currently included in this report, they have been shown in previous issues.

Nearly all series have undergone changes in definition, coverage, or estimation procedure since 1919; therefore, the historical comparisons are to be considered only approximate. Furthermore, it is sometimes necessary to use data for a closely related series for cycles prior to the period covered by the series used currently. The principal substitutions of this type are as follows:

7. New private nonfarm dwelling units started (prior to 1948: Residential building contracts, floor space, by F. W. Dodge Corp.)
41. Number of employees in nonagricultural establishments (prior to 1929: Factory employment)
52. Personal income (prior to 1929: Quarterly data as published by Barger and Klein)
54. Sales of retail stores (prior to 1929: Department store sales)
62. Index of labor cost per unit of output, total manufacturing (prior to 1948: Production worker wage cost per unit).

CHARTS

Two types of charts are used to highlight the cyclical patterns of the business cycle series: Historical time series and cyclical comparisons.

Historical Time Series (charts 1 and 2)

These charts show cyclical fluctuations against the background of expansions and contractions in general business activity from 1948 to the current month. Shaded areas on the charts indicate periods of business cycle contractions between business cycle peak dates (beginnings of shaded areas) and business cycle trough dates (ends of shaded areas). The shading for a new contraction will be entered only after a trough has been designated.

Several different ratio and arithmetic scales are used to highlight the cyclical movements of the various series. The scale selected for each series is identified in the margin of the chart. Rates of change of various series can be compared with each other only where scales are identical. See the diagram, page 6, for additional help in using these charts.

Cyclical Comparisons (chart 3)

This chart compares the movements of selected series during the current business cycle with their movements through the corresponding phases of previous business cycles. Actually, it is an extension of the concept behind table 6. While table 6 makes a comparison at one point in time, chart 3 shows these comparisons over the course of the whole business cycle. These comparisons facilitate judgments on the vigor of the current expansion relative to behavior during the expansions of earlier cycles.

Instead of following the usual date sequence, as in charts 1 and 2, the data in this chart are alined according to the strategic points of the business cycle. Each of the included series is separated into four segments which encompass the three complete business cycles since 1948 and the current expansion. These segments are alined so that the trough dates all fall at the same point on the horizontal scale and so that the levels of the preceding peaks all fall at the same point on the vertical scale.

A similar chart, based on specific cycle dates, was previously included in this report but has been discontinued for the present.

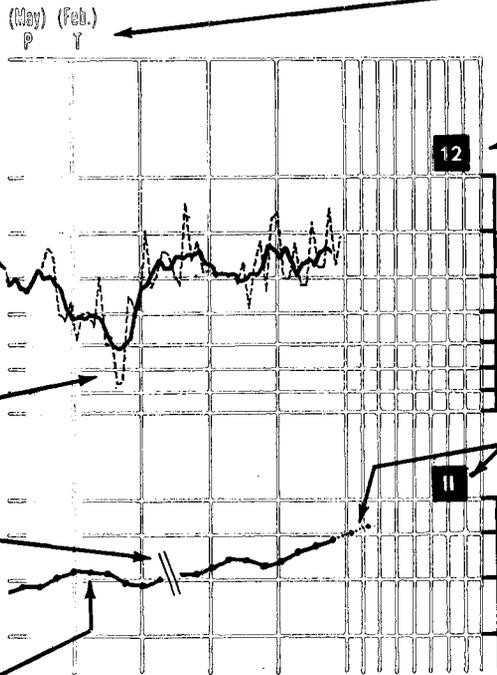
HOW TO READ CHARTS 1 AND 2

Peak (P) of cycle indicates end of expansion and beginning of Recession (shaded areas) as designated by NBER.

CHART 1 — Business Cycle Series

Trough (T) of cycle indicates end of recession and beginning of Expansion (white areas) as designated by NBER.

See **back cover** for complete titles and sources of series.



Arabic number indicates latest month for which data are plotted. ("12" = December)

Solid line indicates monthly data. (Data may be actual monthly figures or MCD moving averages.*)

Roman number indicates latest quarter for which data are plotted. ("II" = second quarter)

Broken line indicates actual monthly data for series where an MCD moving average* is plotted.

Dotted line indicates anticipated data.

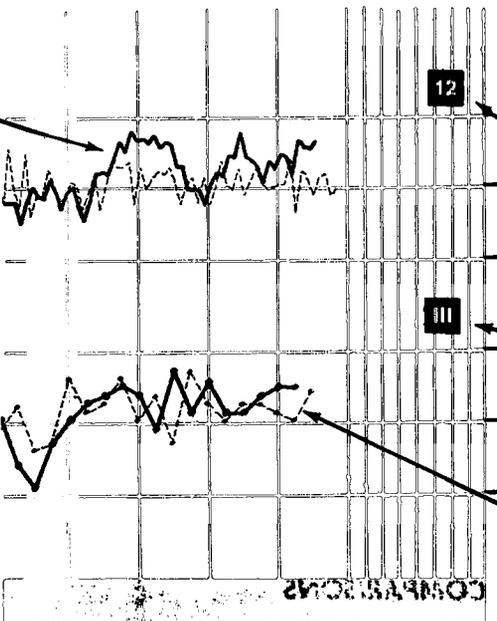
Parallel lines indicate a break in continuity (data not available, changes in series definitions, extreme values, etc.)

Various scales are used to highlight the patterns of the individual series. Series plotted to different scales are not directly comparable. "Scale A" is an arithmetic scale, "scale L-1" is a logarithmic scale with 1 cycle in a given distance, "scale L-2" is a logarithmic scale with 2 cycles in that distance, etc.

Solid line with plotting points indicates quarterly data.

CHART 2 — Diffusion Indexes

Solid line indicates monthly data over 6- or 9-month spans.



Scale shows percent of components rising.

Broken line indicates monthly data over 1-month spans.

Arabic number indicates latest month for which data are used in computing the indexes. ("12" = December)

Solid line with plotting points indicates quarterly data over various spans.

Roman number indicates latest quarter for which data are used in computing the indexes. ("III" = third quarter)

* Many of the more irregular series are shown in terms of their MCD moving averages as well as their actual monthly data. In such cases, the 4-, 5-, or 6-term moving averages are plotted 1½, 2, or 2½ months, respectively, behind the actual data. See page 2 for a description of MCD moving averages.

Broken line with plotting points indicates quarterly data over various intervals. This line is also used to indicate anticipated quarterly data.

DESCRIPTIONS AND PROCEDURES

INTRODUCTION

Students of economic conditions describe the business cycle as consisting of alternating periods of expansion and contraction in production, employment, income, money flows, prices, and other economic processes. The fluctuations take place in a concerted manner, but not simultaneously. Once an expansion gets underway, it spreads from firm to firm, from industry to industry, from area to area, and from process to process, cumulating until a cyclical peak in aggregate activity is reached. Even while expansion is widespread during the upward phase of the business cycle, some activities continue to move in the opposite direction. Declines begin to spread as the expansion nears its peak and continue to spread even faster after the peak has been passed. But some activities continue to expand during the general contraction. Before long these expansions become stronger and more widespread. When they begin to dominate the situation, the upturn in aggregate activity has arrived and a new expansion is underway. This sequence is recurrent, but not periodic.

The causal relations among these various economic processes are primarily responsible for the cumulative nature of cyclical forces, and explain why expansion eventually turns into recession and recession into expansion. Cyclical fluctuations in production and employment are preceded by fluctuations in measures which relate to future rather than to current production—measures such as new orders for durable goods, the formation of new business enterprises, and accessions to payrolls. They are followed by fluctuations in various types of economic costs, such as labor costs, interest rates, fulfillment of long-term commitments, and holdings of inventories and of debts.

Although this pattern has been characteristic of American economic history, today many economists do not consider it inevitable.

Intensive research by the National Bureau of Economic Research (NBER) over many years has provided a list of those significant series that usually lead, those that usually move with, and those that usually lag behind cyclical movements in aggregate economic ac-

tivity. The series have been grouped and classified by the NBER as "leading", "roughly coincident", or "lagging" indicators. These indicators are defined as follows:

- ▶ *NBER Leading Indicators.*—Series that usually reach peaks or troughs before those in aggregate economic activity as measured by the roughly coincident series (see below). One group of these series pertains to activities in the labor market, another to orders and contracts, and so on.
- ▶ *NBER Roughly Coincident Indicators.*—Series that are direct measures of aggregate economic activity or move roughly together with it; for example, nonagricultural employment, industrial production, and retail sales.
- ▶ *NBER Lagging Indicators.*—Series, such as new plant and equipment expenditures and manufacturers' inventories, that usually reach turning points after they are reached in aggregate economic activity.

Other U.S. series with business cycle significance are included in this report. 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.

The list of series covered and sources of the basic data are shown on the back cover of this report. Series numbers are for identification only and do not reflect series relationships or order.

METHOD OF PRESENTATION

Data are shown in this report in three general categories, as follows:

- ▶ *Basic Data* (chart 1 and tables 1 and 2).—Data are shown for business cycle indicators, additional

U.S. series with business cycle significance, and industrial production indexes for selected countries. 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* (chart 2 and tables 3 to 5).— These are measures that aid in forming a judgment of the imminence of a turning point in the business cycle, determining the extent of current changes in different parts of the economy, and pointing to developments in particular industries and places.
- ▷ *Cyclical Patterns* (chart 3 and tables 6 and 7).— Current cyclical levels are compared with levels 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.

DESIGNATION OF BUSINESS CYCLE TURNING POINTS

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

Monthly business cycle peaks and troughs have been dated by the NBER for the period 1854-1961. Over this span, expansion has prevailed 61 percent of the time and contraction, 39 percent. If war periods are disregarded, expansion has prevailed 56 percent of the time and contraction, 44 percent.

SEASONAL AND RELATED STATISTICAL ADJUSTMENTS

Adjustments for normal seasonal fluctuations are often necessary to bring out the underlying cyclical trends of a series. Such adjustments allow for periodic intra-year variations resulting chiefly from normal differences in weather conditions during the year and from various institutional arrangements. Some series contain considerable variation attributable to the number of working or trading days in each month. An additional adjustment is necessary in such cases to reduce this variation. Variations due to holidays are usually accounted for by the seasonal adjustment process; how-

ever, there are some cases in which a separate holiday adjustment is necessary for holidays with variable dates. Such a case is retail sales of apparel which is affected strongly by the date of Easter and, to a lesser degree, by the dates of Labor Day and Thanksgiving.

In general, the seasonal adjustment process is designed to adjust for *average* weather conditions but not for the dispersion about that average. Thus, some seasonally adjusted series, such as housing starts, will tend to be low in months of unusually bad weather and high during unusually good weather. At the Bureau of the Census, studies have been started on some series to determine the effects of abnormal weather. Although it eventually may be possible, Census methods do not at present make any adjustments for such variations.

Most of the series contained in this report are presented in seasonally adjusted form. Unadjusted data are used only for those series which appear to have no pattern of seasonal variation. (Unadjusted series are identified in table 2.) In most cases, the seasonally adjusted data used for a series are the official figures released by the source agency; therefore, several different methods of seasonal adjustment are involved. In addition, 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. For these series, seasonal adjustments have been developed by either the NBER or the Census Bureau. The adjustment factors for these series, derived by Census Method II, are shown in appendix D. Factors for series which are the sums of seasonally adjusted components or which are based on unpublished source data are not shown.

MCD MOVING AVERAGES

MCD (months for cyclical dominance) is an estimate of the appropriate span over which to observe the cyclical movements in a monthly series. This span is usually longer than a single month because month-to-month changes are often dominated by erratic movements, but shorter than the frequently used 12-month span (change from the same month a year ago), and is different for different series (see appendix C for MCD values and method of computation).

MCD is, on average, the first span of months for which the average change for the cyclical factor is greater than that of the irregular factor and remains so. It is small for smooth series and large for irregular series. The month-to-month differences between moving averages of the period equal to MCD are commensurate with the differences between seasonally

adjusted values separated by the same MCD span; thus, the month-to-month differences in a 3-month moving average are commensurate with differences in seasonally adjusted values over 3-month spans. MCD moving averages all have about the same degree of smoothness. Consequently, MCD moving averages of highly irregular series, such as business failures and Federal cash payments, will show their cyclical movements about as clearly as the seasonally adjusted data for such smooth series as industrial production.

MCD moving averages are shown in chart 1 for all series with an MCD of "5" or more. To provide an indication of the variation about these moving averages, seasonally adjusted data are also plotted beginning with 1958. Although not so smooth as more powerful moving averages (such as the weighted 13-term Henderson curve), the MCD curve is more current and has a smaller rounding bias around business cycle peaks and troughs. On balance, the MCD curve seems to offer a reasonable compromise in terms of currency, smoothness, and fidelity to the patterns of business cycle fluctuations.

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ANALYTICAL MEASURES OF CURRENT CHANGE

Three kinds of analytical measures are presented—timing distributions, diffusion indexes, and directions of change. These measures aid in forming a judgment of the 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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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. This timing distribution shows 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 presented during contractions.

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To compile timing distributions for the current cyclical phase, the data for the leading and roughly coincident business cycle indicators are scanned each month. During a business cycle expansion, the date of the high value for each series is recorded. (For inverted series—that is, series with negative conformity to the business cycle—dates of low values are taken.) 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 may be disregarded, although it is, of course, difficult to identify an erratic value, particularly for the current month.

The letter "H" is used in table 2 to identify and highlight the current high values during the expansion. The highs designated during the current cyclical phase will not necessarily be the specific cycle peaks. (See appendix B.) As new high levels are reached during the expansion, the current highs will be moved ahead. Comparisons of the current timing distributions with those for periods around earlier business cycle peaks are helpful for appraising the evidence of a prospective business cycle turning point.

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Series numbers preceded by the letter "D" designate diffusion indexes. When one of these numbers corresponds to the number of a basic indicator series, 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 6. Diffusion indexes not computed from basic series components are assigned new numbers.

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In addition to comparing cyclical fluctuations on the basis of reference dates, which are the same for all series, similar comparisons may be made using the specific peak and trough dates identified for each series. (Appendix B lists specific dates for a selected group of series.) Such comparisons would be based on changes from *specific peak levels and specific trough dates* and on changes from *specific trough levels and specific trough dates*. Although these specific cycle comparisons are not currently included in this report, they have been shown in previous issues.

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These charts show cyclical fluctuations against the background of expansions and contractions in general business activity from 1948 to the current month. Shaded areas on the charts indicate periods of business cycle contractions between business cycle peak dates (beginnings of shaded areas) and business cycle trough dates (ends of shaded areas). The shading for a new contraction will be entered only after a trough has been designated.

Several different ratio and arithmetic scales are used to highlight the cyclical movements of the various series. The scale selected for each series is identified in the margin of the chart. Rates of change of various series can be compared with each other only where scales are identical. See the diagram, page 6, for additional help in using these charts.

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This chart compares the movements of selected series during the current business cycle with their movements through the corresponding phases of previous business cycles. Actually, it is an extension of the concept behind table 6. While table 6 makes a comparison at one point in time, chart 3 shows these comparisons over the course of the whole business cycle. These comparisons facilitate judgments on the vigor of the current expansion relative to behavior during the expansions of earlier cycles.

Instead of following the usual date sequence, as in charts 1 and 2, the data in this chart are aligned according to the strategic points of the business cycle. Each of the included series is separated into four segments which encompass the three complete business cycles since 1948 and the current expansion. These segments are aligned so that the trough dates all fall at the same point on the horizontal scale and so that the levels of the preceding peaks all fall at the same point on the vertical scale.

A similar chart, based on specific cycle dates, was previously included in this report but has been discontinued for the present.

HOW TO READ CHARTS 1 AND 2

Peak (P) of cycle indicates end of expansion and beginning of Recession (shaded areas) as designated by NBER.

CHART 1 — Business Cycle Series

Trough (T) of cycle indicates end of recession and beginning of Expansion (white areas) as designated by NBER.

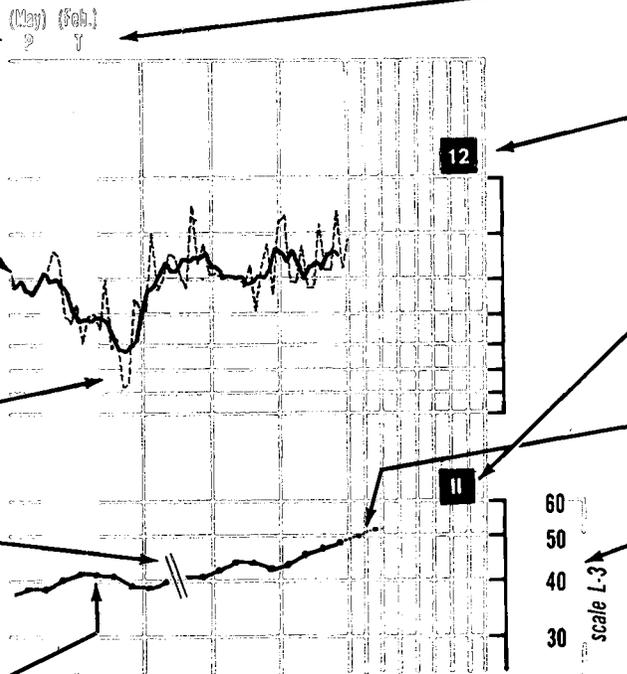
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Solid line with plotting points indicates quarterly data.



Arabic number indicates latest month for which data are plotted. ("12" = December)

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Dotted line indicates anticipated data.

Various scales are used to highlight the patterns of the individual series. Series plotted to different scales are not directly comparable. "Scale A" is an arithmetic scale with 1 cycle in a given distance, "scale L-1" is a logarithmic scale with 2 cycles in that distance, etc.

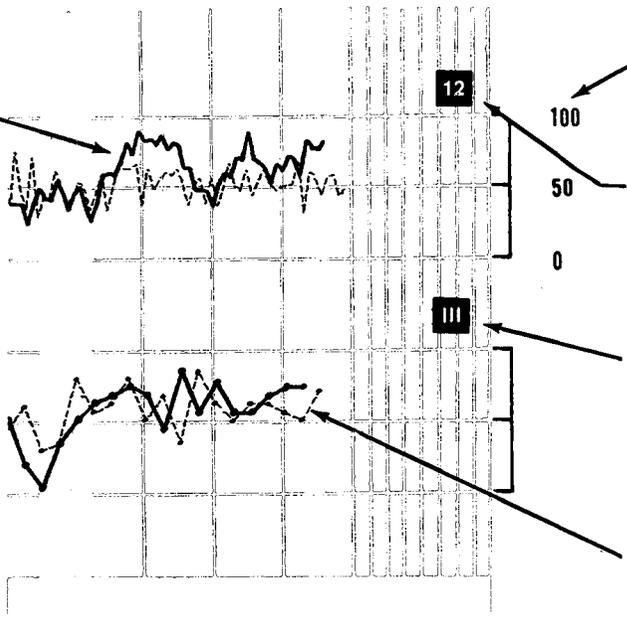
CHART 2 — Diffusion Indexes

Solid line indicates monthly data over 6- or 9-month spans.

Broken line indicates monthly data over 1-month spans.

Solid line with plotting points indicates quarterly data over various spans.

* Many of the more irregular series are shown in terms of their MCD moving averages as well as their actual monthly data. In such cases, the 4-, 5-, or 6-term moving averages are plotted 1½, 2, or 2½ months, respectively, behind the actual data. See page 2 for a description of MCD moving averages.



Scale shows percent of components rising.

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DESCRIPTIONS AND PROCEDURES

INTRODUCTION

Students of economic conditions describe the business cycle as consisting of alternating periods of expansion and contraction in production, employment, income, money flows, prices, and other economic processes. The fluctuations take place in a concerted manner, but not simultaneously. Once an expansion gets underway, it spreads from firm to firm, from industry to industry, from area to area, and from process to process, cumulating until a cyclical peak in aggregate activity is reached. Even while expansion is widespread during the upward phase of the business cycle, some activities continue to move in the opposite direction. Declines begin to spread as the expansion nears its peak and continue to spread even faster after the peak has been passed. But some activities continue to expand during the general contraction. Before long these expansions become stronger and more widespread. When they begin to dominate the situation, the upturn in aggregate activity has arrived and a new expansion is underway. This sequence is recurrent, but not periodic.

The causal relations among these various economic processes are primarily responsible for the cumulative nature of cyclical forces, and explain why expansion eventually turns into recession and recession into expansion. Cyclical fluctuations in production and employment are preceded by fluctuations in measures which relate to future rather than to current production—measures such as new orders for durable goods, the formation of new business enterprises, and accessions to payrolls. They are followed by fluctuations in various types of economic costs, such as labor costs, interest rates, fulfillment of long-term commitments, and holdings of inventories and of debts.

Although this pattern has been characteristic of American economic history, today many economists do not consider it inevitable.

Intensive research by the National Bureau of Economic Research (NBER) over many years has provided a list of those significant series that usually lead, those that usually move with, and those that usually lag behind cyclical movements in aggregate economic ac-

tivity. The series have been grouped and classified by the NBER as "leading", "roughly coincident", or "lagging" indicators. These indicators are defined as follows:

- ▶ *NBER Leading Indicators*.—Series that usually reach peaks or troughs before those in aggregate economic activity as measured by the roughly coincident series (see below). One group of these series pertains to activities in the labor market, another to orders and contracts, and so on.
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SEASONAL AND RELATED STATISTICAL ADJUSTMENTS

Adjustments for normal seasonal fluctuations are often necessary to bring out the underlying cyclical trends of a series. Such adjustments allow for periodic intra-year variations resulting chiefly from normal differences in weather conditions during the year and from various institutional arrangements. Some series contain considerable variation attributable to the number of working or trading days in each month. An additional adjustment is necessary in such cases to reduce this variation. Variations due to holidays are usually accounted for by the seasonal adjustment process; how-

ever, there are some cases in which a separate holiday adjustment is necessary for holidays with variable dates. Such a case is retail sales of apparel which is affected strongly by the date of Easter and, to a lesser degree, by the dates of Labor Day and Thanksgiving.

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Most of the series contained in this report are presented in seasonally adjusted form. Unadjusted data are used only for those series which appear to have no pattern of seasonal variation. (Unadjusted series are identified in table 2.) In most cases, the seasonally adjusted data used for a series are the official figures released by the source agency; therefore, several different methods of seasonal adjustment are involved. In addition, 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. For these series, seasonal adjustments have been developed by either the NBER or the Census Bureau. The adjustment factors for these series, derived by Census Method II, are shown in appendix D. Factors for series which are the sums of seasonally adjusted components or which are based on unpublished source data are not shown.

MCD MOVING AVERAGES

MCD (months for cyclical dominance) is an estimate of the appropriate span over which to observe the cyclical movements in a monthly series. This span is usually longer than a single month because month-to-month changes are often dominated by erratic movements, but shorter than the frequently used 12-month span (change from the same month a year ago), and is different for different series (see appendix C for MCD values and method of computation).

MCD is, on average, the first span of months for which the average change for the cyclical factor is greater than that of the irregular factor and remains so. It is small for smooth series and large for irregular series. The month-to-month differences between moving averages of the period equal to MCD are commensurate with the differences between seasonally

adjusted values separated by the same MCD span; thus, the month-to-month differences in a 3-month moving average are commensurate with differences in seasonally adjusted values over 3-month spans. MCD moving averages all have about the same degree of smoothness. Consequently, MCD moving averages of highly irregular series, such as business failures and Federal cash payments, will show their cyclical movements about as clearly as the seasonally adjusted data for such smooth series as industrial production.

MCD moving averages are shown in chart 1 for all series with an MCD of "5" or more. To provide an indication of the variation about these moving averages, seasonally adjusted data are also plotted beginning with 1958. Although not so smooth as more powerful moving averages (such as the weighted 13-term Henderson curve), the MCD curve is more current and has a smaller rounding bias around business cycle peaks and troughs. On balance, the MCD curve seems to offer a reasonable compromise in terms of currency, smoothness, and fidelity to the patterns of business cycle fluctuations.

Because of advance reporting and preliminary seasonal factors, the MCD's for current data are usually larger than those computed from historical series and shown in appendix C. MCD is usually computed for a fairly long period, one covering both expansions and contractions. Since the pace of change varies from phase to phase of the business cycle, such a measure will not provide an accurate estimate of the span over which to estimate cyclically significant changes at all times. Thus, MCD computed for the period 1953-63 is likely to be too high during the early stages of recovery when expansion has usually been rapid and too low during the late stages of expansion when the rate of advance has usually been small. This limitation should be borne in mind when making use of this measure.¹

ANALYTICAL MEASURES OF CURRENT CHANGE

Three kinds of analytical measures are presented—timing distributions, diffusion indexes, and directions of change. These measures aid in forming a judgment of the 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.

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. This timing distribution shows 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 presented 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 leading and roughly coincident business cycle indicators are scanned each month. During a business cycle expansion, the date of the high value for each series is recorded. (For inverted series—that is, series with negative conformity to the business cycle—dates of low values are taken.) 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 may be disregarded, although it is, of course, difficult to identify an erratic value, particularly for the current month.

The letter "H" is used in table 2 to identify and highlight the current high values during the expansion. The highs designated during the current cyclical phase will not necessarily be the specific cycle peaks. (See appendix B.) As new high levels are reached during the expansion, the current highs will be moved ahead. Comparisons of the current timing distributions with those for periods around earlier business cycle 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 simply reflect a short reversal in the upward movement.

Diffusion Indexes

Diffusion indexes are simple summary measures of groups of economic series. They express, for a given aggregate series, the percent of the series components

¹ For a more complete description of MCD and its use in studying economic series, see *Business Cycle Indicators*, Geoffrey H. Moore, editor; National Bureau of Economic Research, Inc., vol. 1, ch. 18, "Statistics for Short-Term Economic Forecasting," by Julius Shiskin (Princeton University Press:

which have risen over given spans 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 and widespread declines with sharp reductions in aggregate activity.

The diffusion indexes in this report are grouped according to the timing classification of the NBER. For monthly series, comparisons are made over 1-month spans (January-February, February-March, etc.) and generally for either 6- or 9-month spans, depending upon the irregularity of the series. The indexes based on 1-month spans are more "current" but they are also more irregular than the 6- or 9-month indexes. (See chart 2.) Quarterly series are compared over 1-quarter spans, 3-quarter spans, and 4-quarter spans.

Recent research has shown that the longer-span diffusion indexes are not only smoother, but have systematically larger amplitudes than the 1-month indexes. The 1-month indexes generally have large irregular fluctuations, but the movements may be significant when important changes are taking place, particularly around cyclical turning points. Since the longer-span diffusion indexes are centered, there is an apparent loss in currency equal to one-half the span; for example, 3 months in the case of a 6-month diffusion index. However, the most recent figure for a 6-month or longer-span index does provide the latest available information on changes *over that span*. If a significant reversal has taken place *within that span*, the 1-month indexes are likely to reveal it. Presentation of both 1-month and longer-span diffusion indexes provides an opportunity for the user to take advantage of the best features of each in interpreting current changes.

Series numbers preceded by the letter "D" designate diffusion indexes. When one of these numbers corresponds to the number of a basic indicator series, 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 6. Diffusion indexes not computed from basic series components are assigned new numbers.

Diffusion indexes that are based on business expectations 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-Index Components

Many of the component series used to make up the diffusion indexes are shown in table 5. Where possible, recent basic data for the components are shown in part A. In part B, directions of change in these components are indicated for consecutive months and, depending upon the irregularity of the diffusion index, for either 6- or 9-month spans. The directions of change are indicated by "+" for rising, "o" for unchanged, and "-" for falling. (In counting the number of components rising, a "o" is counted as one-half.)

This table provides a convenient view of changing business conditions and is helpful in making an economic interpretation of the movements in the more highly aggregated statistical measures. That is, it shows which economic activities went up, which went down, and how long such movements have persisted. The table also helps 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 various series 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 whether the current cyclical phase is an expansion or contraction.

Expansions are compared in one way by measuring changes from the immediately preceding peak levels. In table 6 of this report, data for the latest month in the current expansion (shown by number of months from the February 1961 trough) are compared with the May 1960 reference peak. For each earlier expansion, data for a like period (same number of months from the trough of the expansion) are compared with the preceding reference peak. This type of comparison is designated as changes computed *from reference peak levels and reference trough dates*. This type of comparison shows whether, and by how much, the current level of activity exceeds or falls short of the level at the preceding business cycle peak, and how the current situation compares, in this respect, with earlier expansions. For those earlier periods of expansion that were shorter than the current one, the comparisons reflect the status at a point after a new contraction had set in.

Expansions are also compared by computing changes from *reference trough levels and reference trough dates* (table 7). For the current expansion, this type of comparison measures the extent of the rise from the trough level (February 1961) to the level at the current month. For each earlier expansion, data for a like period (same number of months from the trough of the expansion) are compared with the level at the trough. The same situation exists here as for the comparisons shown in table 6: For earlier expansions that were shorter than the current one, the comparisons show the status at a point after a new contraction had set in.

Contractions can be 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 changes from *reference peak levels and reference peak dates*. These comparisons will be made during a contraction period.

In addition to comparing cyclical fluctuations on the basis of reference dates, which are the same for all series, similar comparisons may be made using the specific peak and trough dates identified for each series. (Appendix B lists specific dates for a selected group of series.) Such comparisons would be based on changes from *specific peak levels and specific trough dates* and on changes from *specific trough levels and specific trough dates*. Although these specific cycle comparisons are not currently included in this report, they have been shown in previous issues.

Nearly all series have undergone changes in definition, coverage, or estimation procedure since 1919; therefore, the historical comparisons are to be considered only approximate. Furthermore, it is sometimes necessary to use data for a closely related series for cycles prior to the period covered by the series used currently. The principal substitutions of this type are as follows:

7. New private nonfarm dwelling units started (prior to 1948: Residential building contracts, floor space, by F. W. Dodge Corp.)
41. Number of employees in nonagricultural establishments (prior to 1929: Factory employment)
52. Personal income (prior to 1929: Quarterly data as published by Barger and Klein)
54. Sales of retail stores (prior to 1929: Department store sales)
62. Index of labor cost per unit of output, total manufacturing (prior to 1948: Production worker wage cost per unit).

CHARTS

Two types of charts are used to highlight the cyclical patterns of the business cycle series: Historical time series and cyclical comparisons.

Historical Time Series (charts 1 and 2)

These charts show cyclical fluctuations against the background of expansions and contractions in general business activity from 1948 to the current month. Shaded areas on the charts indicate periods of business cycle contractions between business cycle peak dates (beginnings of shaded areas) and business cycle trough dates (ends of shaded areas). The shading for a new contraction will be entered only after a trough has been designated.

Several different ratio and arithmetic scales are used to highlight the cyclical movements of the various series. The scale selected for each series is identified in the margin of the chart. Rates of change of various series can be compared with each other only where scales are identical. See the diagram, page 6, for additional help in using these charts.

Cyclical Comparisons (chart 3)

This chart compares the movements of selected series during the current business cycle with their movements through the corresponding phases of previous business cycles. Actually, it is an extension of the concept behind table 6. While table 6 makes a comparison at one point in time, chart 3 shows these comparisons over the course of the whole business cycle. These comparisons facilitate judgments on the vigor of the current expansion relative to behavior during the expansions of earlier cycles.

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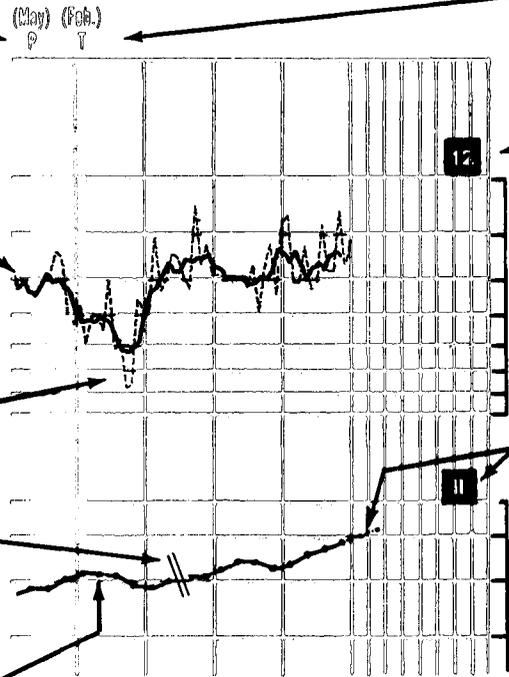
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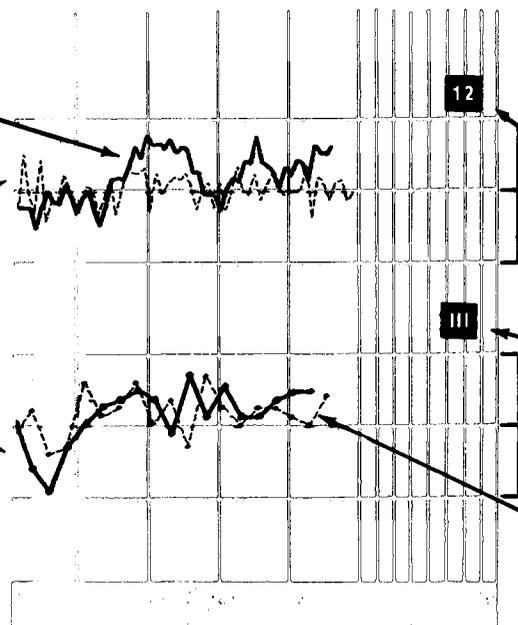
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Because of advance reporting and preliminary seasonal factors, the MCD's for current data are usually larger than those computed from historical series and shown in appendix C. MCD is usually computed for a fairly long period, one covering both expansions and contractions. Since the pace of change varies from phase to phase of the business cycle, such a measure will not provide an accurate estimate of the span over which to estimate cyclically significant changes at all times. Thus, MCD computed for the period 1953-63 is likely to be too high during the early stages of recovery when expansion has usually been rapid and too low during the late stages of expansion when the rate of advance has usually been small. This limitation should be borne in mind when making use of this measure.¹

ANALYTICAL MEASURES OF CURRENT CHANGE

Three kinds of analytical measures are presented—timing distributions, diffusion indexes, and directions of change. These measures aid in forming a judgment of the 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.

¹ For a more complete description of MCD and its use in studying economic series, see *Business Cycle Indicators*, Geoffrey H. Moore, editor; National Bureau of Economic Research, Inc., vol. 1, ch. 18, "Statistics for Short-Term Economic Forecasting," by Julius Shiskin (Princeton University Press: 1961).

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. This timing distribution shows 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 presented 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 leading and roughly coincident business cycle indicators are scanned each month. During a business cycle expansion, the date of the high value for each series is recorded. (For inverted series—that is, series with negative conformity to the business cycle—dates of low values are taken.) 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 may be disregarded, although it is, of course, difficult to identify an erratic value, particularly for the current month.

The letter "H" is used in table 2 to identify and highlight the current high values during the expansion. The highs designated during the current cyclical phase will not necessarily be the specific cycle peaks. (See appendix B.) As new high levels are reached during the expansion, the current highs will be moved ahead. Comparisons of the current timing distributions with those for periods around earlier business cycle 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 simply reflect a short reversal in the upward movement.

Diffusion Indexes

Diffusion indexes are simple summary measures of groups of economic series. They express, for a given aggregate series, the percent of the series components

which have risen over given spans 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 and widespread declines with sharp reductions in aggregate activity.

The diffusion indexes in this report are grouped according to the timing classification of the NBER. For monthly series, comparisons are made over 1-month spans (January-February, February-March, etc.) and generally for either 6- or 9-month spans, depending upon the irregularity of the series. The indexes based on 1-month spans are more "current" but they are also more irregular than the 6- or 9-month indexes. (See chart 2.) Quarterly series are compared over 1-quarter spans, 3-quarter spans, and 4-quarter spans.

Recent research has shown that the longer-span diffusion indexes are not only smoother, but have systematically larger amplitudes than the 1-month indexes. The 1-month indexes generally have large irregular fluctuations, but the movements may be significant when important changes are taking place, particularly around cyclical turning points. Since the longer-span diffusion indexes are centered, there is an apparent loss in currency equal to one-half the span; for example, 3 months in the case of a 6-month diffusion index. However, the most recent figure for a 6-month or longer-span index does provide the latest available information on changes *over that span*. If a significant reversal has taken place *within that span*, the 1-month indexes are likely to reveal it. Presentation of both 1-month and longer-span diffusion indexes provides an opportunity for the user to take advantage of the best features of each in interpreting current changes.

Series numbers preceded by the letter "D" designate diffusion indexes. When one of these numbers corresponds to the number of a basic indicator series, 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 6. Diffusion indexes not computed from basic series components are assigned new numbers.

Diffusion indexes that are based on business expectations 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-Index Components

Many of the component series used to make up the diffusion indexes are shown in table 5. Where possible, recent basic data for the components are shown in part A. In part B, directions of change in these components are indicated for consecutive months and, depending upon the irregularity of the diffusion index, for either 6- or 9-month spans. The directions of change are indicated by "+" for rising, "o" for unchanged, and "-" for falling. (In counting the number of components rising, a "o" is counted as one-half.)

This table provides a convenient view of changing business conditions and is helpful in making an economic interpretation of the movements in the more highly aggregated statistical measures. That is, it shows which economic activities went up, which went down, and how long such movements have persisted. The table also helps 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 various series 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 whether the current cyclical phase is an expansion or contraction.

Expansions are compared in one way by measuring changes from the immediately preceding peak levels. In table 6 of this report, data for the latest month in the current expansion (shown by number of months from the February 1961 trough) are compared with the May 1960 reference peak. For each earlier expansion, data for a like period (same number of months from the trough of the expansion) are compared with the preceding reference peak. This type of comparison is designated as changes computed *from reference peak levels and reference trough dates*. This type of comparison shows whether, and by how much, the current level of activity exceeds or falls short of the level at the preceding business cycle peak, and how the current situation compares, in this respect, with earlier expansions. For those earlier periods of expansion that were shorter than the current one, the comparisons reflect the status at a point after a new contraction had set in.

Expansions are also compared by computing changes from reference trough levels and reference trough dates (table 7). For the current expansion, this type of comparison measures the extent of the rise from the trough level (February 1961) to the level at the current month. For each earlier expansion, data for a like period (same number of months from the trough of the expansion) are compared with the level at the trough. The same situation exists here as for the comparisons shown in table 6: For earlier expansions that were shorter than the current one, the comparisons show the status at a point after a new contraction had set in.

Contractions can be 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 changes from reference peak levels and reference peak dates. These comparisons will be made during a contraction period.

In addition to comparing cyclical fluctuations on the basis of reference dates, which are the same for all series, similar comparisons may be made using the specific peak and trough dates identified for each series. (Appendix B lists specific dates for a selected group of series.) Such comparisons would be based on changes from specific peak levels and specific trough dates and on changes from specific trough levels and specific trough dates. Although these specific cycle comparisons are not currently included in this report, they have been shown in previous issues.

Nearly all series have undergone changes in definition, coverage, or estimation procedure since 1919; therefore, the historical comparisons are to be considered only approximate. Furthermore, it is sometimes necessary to use data for a closely related series for cycles prior to the period covered by the series used currently. The principal substitutions of this type are as follows:

7. New private nonfarm dwelling units started (prior to 1948: Residential building contracts, floor space, by F. W. Dodge Corp.)
41. Number of employees in nonagricultural establishments (prior to 1929: Factory employment)
52. Personal income (prior to 1929: Quarterly data as published by Barger and Klein)
54. Sales of retail stores (prior to 1929: Department store sales)
62. Index of labor cost per unit of output, total manufacturing (prior to 1948: Production worker wage cost per unit).

CHARTS

Two types of charts are used to highlight the cyclical patterns of the business cycle series: Historical time series and cyclical comparisons.

Historical Time Series (charts 1 and 2)

These charts show cyclical fluctuations against the background of expansions and contractions in general business activity from 1948 to the current month. Shaded areas on the charts indicate periods of business cycle contractions between business cycle peak dates (beginnings of shaded areas) and business cycle trough dates (ends of shaded areas). The shading for a new contraction will be entered only after a trough has been designated.

Several different ratio and arithmetic scales are used to highlight the cyclical movements of the various series. The scale selected for each series is identified in the margin of the chart. Rates of change of various series can be compared with each other only where scales are identical. See the diagram, page 6, for additional help in using these charts.

Cyclical Comparisons (chart 3)

This chart compares the movements of selected series during the current business cycle with their movements through the corresponding phases of previous business cycles. Actually, it is an extension of the concept behind table 6. While table 6 makes a comparison at one point in time, chart 3 shows these comparisons over the course of the whole business cycle. These comparisons facilitate judgments on the vigor of the current expansion relative to behavior during the expansions of earlier cycles.

Instead of following the usual date sequence, as in charts 1 and 2, the data in this chart are alined according to the strategic points of the business cycle. Each of the included series is separated into four segments which encompass the three complete business cycles since 1948 and the current expansion. These segments are alined so that the trough dates all fall at the same point on the horizontal scale and so that the levels of the preceding peaks all fall at the same point on the vertical scale.

A similar chart, based on specific cycle dates, was previously included in this report but has been discontinued for the present.

HOW TO READ CHARTS 1 AND 2

Peak (P) of cycle indicates end of expansion and beginning of Recession (shaded areas) as designated by NBER.

CHART 1 — Business Cycle Series

Trough (T) of cycle indicates end of recession and beginning of Expansion (white areas) as designated by NBER.

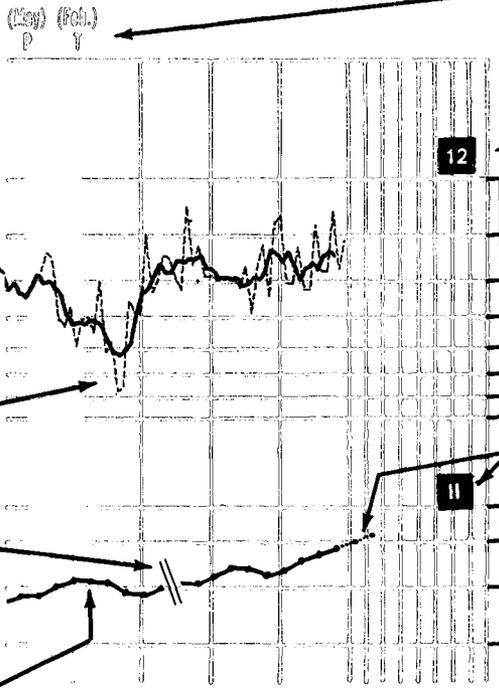
See **back cover** for complete titles and sources of series.

Solid line indicates monthly data. (Data may be actual monthly figures or MCD moving averages.*)

Broken line indicates actual monthly data for series where an MCD moving average* is plotted.

Parallel lines indicate a break in continuity (data not available, changes in series definitions, extreme values, etc.)

Solid line with plotting points indicates quarterly data.



Arabic number indicates latest month for which data are plotted. ("12" = December)

Roman number indicates latest quarter for which data are plotted. ("II" = second quarter)

Dotted line indicates anticipated data.

Various scales are used to highlight the patterns of the individual series. Series plotted to different scales are not directly comparable. "Scale A" is an arithmetic scale, "scale L-1" is a logarithmic scale with 1 cycle in a given distance, "scale L-2" is a logarithmic scale with 2 cycles in that distance, etc.

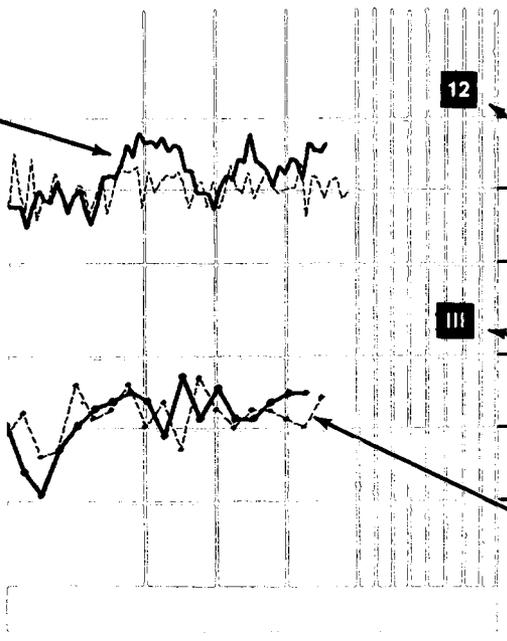
CHART 2 — Diffusion Indexes

Solid line indicates monthly data over 6- or 9-month spans.

Broken line indicates monthly data over 1-month spans.

Solid line with plotting points indicates quarterly data over various spans.

* Many of the more irregular series are shown in terms of their MCD moving averages as well as their actual monthly data. In such cases, the 4-, 5-, or 6-term moving averages are plotted 1½, 2, or 2½ months, respectively, behind the actual data. See page 2 for a description of MCD moving averages.



Scale shows percent of components rising.

Arabic number indicates latest month for which data are used in computing the indexes. ("12" = December)

Roman number indicates latest quarter for which data are used in computing the indexes. ("III" = third quarter)

Broken line with plotting points indicates quarterly data over various intervals. This line is also used to indicate anticipated quarterly data.

DESCRIPTIONS AND PROCEDURES

INTRODUCTION

Students of economic conditions describe the business cycle as consisting of alternating periods of expansion and contraction in production, employment, income, money flows, prices, and other economic processes. The fluctuations take place in a concerted manner, but not simultaneously. Once an expansion gets underway, it spreads from firm to firm, from industry to industry, from area to area, and from process to process, cumulating until a cyclical peak in aggregate activity is reached. Even while expansion is widespread during the upward phase of the business cycle, some activities continue to move in the opposite direction. Declines begin to spread as the expansion nears its peak and continue to spread even faster after the peak has been passed. But some activities continue to expand during the general contraction. Before long these expansions become stronger and more widespread. When they begin to dominate the situation, the upturn in aggregate activity has arrived and a new expansion is underway. This sequence is recurrent, but not periodic.

The causal relations among these various economic processes are primarily responsible for the cumulative nature of cyclical forces, and explain why expansion eventually turns into recession and recession into expansion. Cyclical fluctuations in production and employment are preceded by fluctuations in measures which relate to future rather than to current production—measures such as new orders for durable goods, the formation of new business enterprises, and accessions to payrolls. They are followed by fluctuations in various types of economic costs, such as labor costs, interest rates, fulfillment of long-term commitments, and holdings of inventories and of debts.

Although this pattern has been characteristic of American economic history, today many economists do not consider it inevitable.

Intensive research by the National Bureau of Economic Research (NBER) over many years has provided a list of those significant series that usually lead, those that usually move with, and those that usually lag behind cyclical movements in aggregate economic ac-

tivity. The series have been grouped and classified by the NBER as "leading", "roughly coincident", or "lagging" indicators. These indicators are defined as follows:

- ▷ *NBER Leading Indicators*.—Series that usually reach peaks or troughs before those in aggregate economic activity as measured by the roughly coincident series (see below). One group of these series pertains to activities in the labor market, another to orders and contracts, and so on.
- ▷ *NBER Roughly Coincident Indicators*.—Series that are direct measures of aggregate economic activity or move roughly together with it; for example, nonagricultural employment, industrial production, and retail sales.
- ▷ *NBER Lagging Indicators*.—Series, such as new plant and equipment expenditures and manufacturers' inventories, that usually reach turning points after they are reached in aggregate economic activity.

Other U.S. series with business cycle significance are included in this report. 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.

The list of series covered and sources of the basic data are shown on the back cover of this report. Series numbers are for identification only and do not reflect series relationships or order.

METHOD OF PRESENTATION

Data are shown in this report in three general categories, as follows:

- ▷ *Basic Data* (chart 1 and tables 1 and 2).—Data are shown for business cycle indicators, additional

U.S. series with business cycle significance, and industrial production indexes for selected countries. 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* (chart 2 and tables 3 to 5).— These are measures that aid in forming a judgment of the imminence of a turning point in the business cycle, determining the extent of current changes in different parts of the economy, and pointing to developments in particular industries and places.
- ▷ *Cyclical Patterns* (chart 3 and tables 6 and 7).— Current cyclical levels are compared with levels 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.

DESIGNATION OF BUSINESS CYCLE TURNING POINTS

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

Monthly business cycle peaks and troughs have been dated by the NBER for the period 1854-1961. Over this span, expansion has prevailed 61 percent of the time and contraction, 39 percent. If war periods are disregarded, expansion has prevailed 56 percent of the time and contraction, 44 percent.

SEASONAL AND RELATED STATISTICAL ADJUSTMENTS

Adjustments for normal seasonal fluctuations are often necessary to bring out the underlying cyclical trends of a series. Such adjustments allow for periodic intra-year variations resulting chiefly from normal differences in weather conditions during the year and from various institutional arrangements. Some series contain considerable variation attributable to the number of working or trading days in each month. An additional adjustment is necessary in such cases to reduce this variation. Variations due to holidays are usually accounted for by the seasonal adjustment process; how-

ever, there are some cases in which a separate holiday adjustment is necessary for holidays with variable dates. Such a case is retail sales of apparel which is affected strongly by the date of Easter and, to a lesser degree, by the dates of Labor Day and Thanksgiving.

In general, the seasonal adjustment process is designed to adjust for *average* weather conditions but not for the dispersion about that average. Thus, some seasonally adjusted series, such as housing starts, will tend to be low in months of unusually bad weather and high during unusually good weather. At the Bureau of the Census, studies have been started on some series to determine the effects of abnormal weather. Although it eventually may be possible, Census methods do not at present make any adjustments for such variations.

Most of the series contained in this report are presented in seasonally adjusted form. Unadjusted data are used only for those series which appear to have no pattern of seasonal variation. (Unadjusted series are identified in table 2.) In most cases, the seasonally adjusted data used for a series are the official figures released by the source agency; therefore, several different methods of seasonal adjustment are involved. In addition, 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. For these series, seasonal adjustments have been developed by either the NBER or the Census Bureau. The adjustment factors for these series, derived by Census Method II, are shown in appendix D. Factors for series which are the sums of seasonally adjusted components or which are based on unpublished source data are not shown.

MCD MOVING AVERAGES

MCD (months for cyclical dominance) is an estimate of the appropriate span over which to observe the cyclical movements in a monthly series. This span is usually longer than a single month because month-to-month changes are often dominated by erratic movements, but shorter than the frequently used 12-month span (change from the same month a year ago), and is different for different series (see appendix C for MCD values and method of computation).

MCD is, on average, the first span of months for which the average change for the cyclical factor is greater than that of the irregular factor and remains so. It is small for smooth series and large for irregular series. The month-to-month differences between moving averages of the period equal to MCD are commensurate with the differences between seasonally

adjusted values separated by the same MCD span; thus, the month-to-month differences in a 3-month moving average are commensurate with differences in seasonally adjusted values over 3-month spans. MCD moving averages all have about the same degree of smoothness. Consequently, MCD moving averages of highly irregular series, such as business failures and Federal cash payments, will show their cyclical movements about as clearly as the seasonally adjusted data for such smooth series as industrial production.

MCD moving averages are shown in chart 1 for all series with an MCD of "5" or more. To provide an indication of the variation about these moving averages, seasonally adjusted data are also plotted beginning with 1958. Although not so smooth as more powerful moving averages (such as the weighted 13-term Henderson curve), the MCD curve is more current and has a smaller rounding bias around business cycle peaks and troughs. On balance, the MCD curve seems to offer a reasonable compromise in terms of currency, smoothness, and fidelity to the patterns of business cycle fluctuations.

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Three kinds of analytical measures are presented—timing distributions, diffusion indexes, and directions of change. These measures aid in forming a judgment of the 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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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. This timing distribution shows 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 presented during contractions.

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To compile timing distributions for the current cyclical phase, the data for the leading and roughly coincident business cycle indicators are scanned each month. During a business cycle expansion, the date of the high value for each series is recorded. (For inverted series—that is, series with negative conformity to the business cycle—dates of low values are taken.) 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 may be disregarded, although it is, of course, difficult to identify an erratic value, particularly for the current month.

The letter "H" is used in table 2 to identify and highlight the current high values during the expansion. The highs designated during the current cyclical phase will not necessarily be the specific cycle peaks. (See appendix B.) As new high levels are reached during the expansion, the current highs will be moved ahead. Comparisons of the current timing distributions with those for periods around earlier business cycle peaks are helpful for appraising the evidence of a prospective business cycle turning point.

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Series numbers preceded by the letter "D" designate diffusion indexes. When one of these numbers corresponds to the number of a basic indicator series, 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 6. Diffusion indexes not computed from basic series components are assigned new numbers.

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Expansions are also compared by computing changes from reference trough levels and reference trough dates (table 7). For the current expansion, this type of comparison measures the extent of the rise from the trough level (February 1961) to the level at the current month. For each earlier expansion, data for a like period (same number of months from the trough of the expansion) are compared with the level at the trough. The same situation exists here as for the comparisons shown in table 6: For earlier expansions that were shorter than the current one, the comparisons show the status at a point after a new contraction had set in.

Contractions can be 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 changes from reference peak levels and reference peak dates. These comparisons will be made during a contraction period.

In addition to comparing cyclical fluctuations on the basis of reference dates, which are the same for all series, similar comparisons may be made using the specific peak and trough dates identified for each series. (Appendix B lists specific dates for a selected group of series.) Such comparisons would be based on changes from specific peak levels and specific trough dates and on changes from specific trough levels and specific trough dates. Although these specific cycle comparisons are not currently included in this report, they have been shown in previous issues.

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Two types of charts are used to highlight the cyclical patterns of the business cycle series: Historical time series and cyclical comparisons.

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These charts show cyclical fluctuations against the background of expansions and contractions in general business activity from 1948 to the current month. Shaded areas on the charts indicate periods of business cycle contractions between business cycle peak dates (beginnings of shaded areas) and business cycle trough dates (ends of shaded areas). The shading for a new contraction will be entered only after a trough has been designated.

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Cyclical Comparisons (chart 3)

This chart compares the movements of selected series during the current business cycle with their movements through the corresponding phases of previous business cycles. Actually, it is an extension of the concept behind table 6. While table 6 makes a comparison at one point in time, chart 3 shows these comparisons over the course of the whole business cycle. These comparisons facilitate judgments on the vigor of the current expansion relative to behavior during the expansions of earlier cycles.

Instead of following the usual date sequence, as in charts 1 and 2, the data in this chart are aligned according to the strategic points of the business cycle. Each of the included series is separated into four segments which encompass the three complete business cycles since 1948 and the current expansion. These segments are aligned so that the trough dates all fall at the same point on the horizontal scale and so that the levels of the preceding peaks all fall at the same point on the vertical scale.

A similar chart, based on specific cycle dates, was previously included in this report but has been discontinued for the present.

HOW TO READ CHARTS 1 AND 2

Peak (P) of cycle indicates end of expansion and beginning of Recession (shaded areas) as designated by NBER.

CHART 1 — Business Cycle Series

Trough (T) of cycle indicates end of recession and beginning of Expansion (white areas) as designated by NBER.

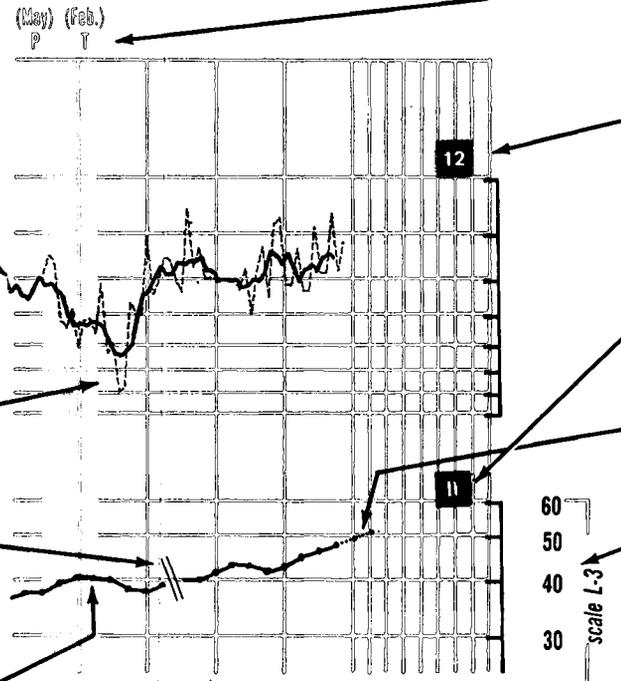
See back cover for complete titles and sources of series.

Solid line indicates monthly data. (Data may be actual monthly figures or MCD moving averages.*)

Broken line indicates actual monthly data for series where an MCD moving average* is plotted.

Parallel lines indicate a break in continuity (data not available, changes in series definitions, extreme values, etc.)

Solid line with plotting points indicates quarterly data.



Arabic number indicates latest month for which data are plotted. ("12" = December)

Roman number indicates latest quarter for which data are plotted. ("II" = second quarter)

Dotted line indicates anticipated data.

Various scales are used to highlight the patterns of the individual series. Series plotted to different scales are not directly comparable. "Scale A" is an arithmetic scale, "scale L-1" is a logarithmic scale with 1 cycle in a given distance, "scale L-2" is a logarithmic scale with 2 cycles in that distance, etc.

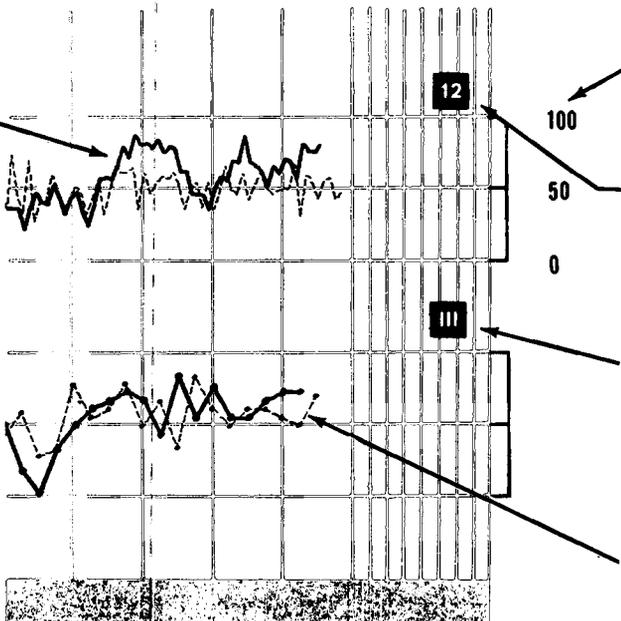
CHART 2 — Diffusion Indexes

Solid line indicates monthly data over 6- or 9-month spans.

Broken line indicates monthly data over 1-month spans.

Solid line with plotting points indicates quarterly data over various spans.

* Many of the more irregular series are shown in terms of their MCD moving averages as well as their actual monthly data. In such cases, the 4-, 5-, or 6-term moving averages are plotted 1½, 2, or 2½ months, respectively, behind the actual data. See page 2 for a description of MCD moving averages.



Scale shows percent of components rising.

Arabic number indicates latest month for which data are used in computing the indexes. ("12" = December)

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INTRODUCTION

Students of economic conditions describe the business cycle as consisting of alternating periods of expansion and contraction in production, employment, income, money flows, prices, and other economic processes. The fluctuations take place in a concerted manner, but not simultaneously. Once an expansion gets underway, it spreads from firm to firm, from industry to industry, from area to area, and from process to process, cumulating until a cyclical peak in aggregate activity is reached. Even while expansion is widespread during the upward phase of the business cycle, some activities continue to move in the opposite direction. Declines begin to spread as the expansion nears its peak and continue to spread even faster after the peak has been passed. But some activities continue to expand during the general contraction. Before long these expansions become stronger and more widespread. When they begin to dominate the situation, the upturn in aggregate activity has arrived and a new expansion is underway. This sequence is recurrent, but not periodic.

The causal relations among these various economic processes are primarily responsible for the cumulative nature of cyclical forces, and explain why expansion eventually turns into recession and recession into expansion. Cyclical fluctuations in production and employment are preceded by fluctuations in measures which relate to future rather than to current production—measures such as new orders for durable goods, the formation of new business enterprises, and accessions to payrolls. They are followed by fluctuations in various types of economic costs, such as labor costs, interest rates, fulfillment of long-term commitments, and holdings of inventories and of debts.

Although this pattern has been characteristic of American economic history, today many economists do not consider it inevitable.

Intensive research by the National Bureau of Economic Research (NBER) over many years has provided a list of those significant series that usually lead, those that usually move with, and those that usually lag behind cyclical movements in aggregate economic ac-

tivity. The series have been grouped and classified by the NBER as “leading”, “roughly coincident”, or “lagging” indicators. These indicators are defined as follows:

- ▷ *NBER Leading Indicators.*—Series that usually reach peaks or troughs before those in aggregate economic activity as measured by the roughly coincident series (see below). One group of these series pertains to activities in the labor market, another to orders and contracts, and so on.
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Other U.S. series with business cycle significance are included in this report. 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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- ▷ *Cyclical Patterns* (chart 3 and tables 6 and 7).— Current cyclical levels are compared with levels 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.

DESIGNATION OF BUSINESS CYCLE TURNING POINTS

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Monthly business cycle peaks and troughs have been dated by the NBER for the period 1854-1961. Over this span, expansion has prevailed 61 percent of the time and contraction, 39 percent. If war periods are disregarded, expansion has prevailed 56 percent of the time and contraction, 44 percent.

SEASONAL AND RELATED STATISTICAL ADJUSTMENTS

Adjustments for normal seasonal fluctuations are often necessary to bring out the underlying cyclical trends of a series. Such adjustments allow for periodic intra-year variations resulting chiefly from normal differences in weather conditions during the year and from various institutional arrangements. Some series contain considerable variation attributable to the number of working or trading days in each month. An additional adjustment is necessary in such cases to reduce this variation. Variations due to holidays are usually accounted for by the seasonal adjustment process; how-

ever, there are some cases in which a separate holiday adjustment is necessary for holidays with variable dates. Such a case is retail sales of apparel which is affected strongly by the date of Easter and, to a lesser degree, by the dates of Labor Day and Thanksgiving.

In general, the seasonal adjustment process is designed to adjust for *average* weather conditions but not for the dispersion about that average. Thus, some seasonally adjusted series, such as housing starts, will tend to be low in months of unusually bad weather and high during unusually good weather. At the Bureau of the Census, studies have been started on some series to determine the effects of abnormal weather. Although it eventually may be possible, Census methods do not at present make any adjustments for such variations.

Most of the series contained in this report are presented in seasonally adjusted form. Unadjusted data are used only for those series which appear to have no pattern of seasonal variation. (Unadjusted series are identified in table 2.) In most cases, the seasonally adjusted data used for a series are the official figures released by the source agency; therefore, several different methods of seasonal adjustment are involved. In addition, 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. For these series, seasonal adjustments have been developed by either the NBER or the Census Bureau. The adjustment factors for these series, derived by Census Method II, are shown in appendix D. Factors for series which are the sums of seasonally adjusted components or which are based on unpublished source data are not shown.

MCD MOVING AVERAGES

MCD (months for cyclical dominance) is an estimate of the appropriate span over which to observe the cyclical movements in a monthly series. This span is usually longer than a single month because month-to-month changes are often dominated by erratic movements, but shorter than the frequently used 12-month span (change from the same month a year ago), and is different for different series (see appendix C for MCD values and method of computation).

MCD is, on average, the first span of months for which the average change for the cyclical factor is greater than that of the irregular factor and remains so. It is small for smooth series and large for irregular series. The month-to-month differences between moving averages of the period equal to MCD are commensurate with the differences between seasonally

adjusted values separated by the same MCD span; thus, the month-to-month differences in a 3-month moving average are commensurate with differences in seasonally adjusted values over 3-month spans. MCD moving averages all have about the same degree of smoothness. Consequently, MCD moving averages of highly irregular series, such as business failures and Federal cash payments, will show their cyclical movements about as clearly as the seasonally adjusted data for such smooth series as industrial production.

MCD moving averages are shown in chart 1 for all series with an MCD of "5" or more. To provide an indication of the variation about these moving averages, seasonally adjusted data are also plotted beginning with 1958. Although not so smooth as more powerful moving averages (such as the weighted 13-term Henderson curve), the MCD curve is more current and has a smaller rounding bias around business cycle peaks and troughs. On balance, the MCD curve seems to offer a reasonable compromise in terms of currency, smoothness, and fidelity to the patterns of business cycle fluctuations.

Because of advance reporting and preliminary seasonal factors, the MCD's for current data are usually larger than those computed from historical series and shown in appendix C. MCD is usually computed for a fairly long period, one covering both expansions and contractions. Since the pace of change varies from phase to phase of the business cycle, such a measure will not provide an accurate estimate of the span over which to estimate cyclically significant changes at all times. Thus, MCD computed for the period 1953-63 is likely to be too high during the early stages of recovery when expansion has usually been rapid and too low during the late stages of expansion when the rate of advance has usually been small. This limitation should be borne in mind when making use of this measure.¹

ANALYTICAL MEASURES OF CURRENT CHANGE

Three kinds of analytical measures are presented—timing distributions, diffusion indexes, and directions of change. These measures aid in forming a judgment of the 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.

¹ For a more complete description of MCD and its use in studying economic series, see *Business Cycle Indicators*, Geoffrey H. Moore, editor; National Bureau of Economic Research, Inc., vol. 1, ch. 18, "Statistics for Short-Term Economic Forecasting," by Julius Shiskin (Princeton University Press: 1961).

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. This timing distribution shows 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 presented 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 leading and roughly coincident business cycle indicators are scanned each month. During a business cycle expansion, the date of the high value for each series is recorded. (For inverted series—that is, series with negative conformity to the business cycle—dates of low values are taken.) 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 may be disregarded, although it is, of course, difficult to identify an erratic value, particularly for the current month.

The letter "H" is used in table 2 to identify and highlight the current high values during the expansion. The highs designated during the current cyclical phase will not necessarily be the specific cycle peaks. (See appendix B.) As new high levels are reached during the expansion, the current highs will be moved ahead. Comparisons of the current timing distributions with those for periods around earlier business cycle 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 simply reflect a short reversal in the upward movement.

Diffusion Indexes

Diffusion indexes are simple summary measures of groups of economic series. They express, for a given aggregate series, the percent of the series components

which have risen over given spans 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 and widespread declines with sharp reductions in aggregate activity.

The diffusion indexes in this report are grouped according to the timing classification of the NBER. For monthly series, comparisons are made over 1-month spans (January-February, February-March, etc.) and generally for either 6- or 9-month spans, depending upon the irregularity of the series. The indexes based on 1-month spans are more "current" but they are also more irregular than the 6- or 9-month indexes. (See chart 2.) Quarterly series are compared over 1-quarter spans, 3-quarter spans, and 4-quarter spans.

Recent research has shown that the longer-span diffusion indexes are not only smoother, but have systematically larger amplitudes than the 1-month indexes. The 1-month indexes generally have large irregular fluctuations, but the movements may be significant when important changes are taking place, particularly around cyclical turning points. Since the longer-span diffusion indexes are centered, there is an apparent loss in currency equal to one-half the span; for example, 3 months in the case of a 6-month diffusion index. However, the most recent figure for a 6-month or longer-span index does provide the latest available information on changes *over that span*. If a significant reversal has taken place *within that span*, the 1-month indexes are likely to reveal it. Presentation of both 1-month and longer-span diffusion indexes provides an opportunity for the user to take advantage of the best features of each in interpreting current changes.

Series numbers preceded by the letter "D" designate diffusion indexes. When one of these numbers corresponds to the number of a basic indicator series, 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 6. Diffusion indexes not computed from basic series components are assigned new numbers.

Diffusion indexes that are based on business expectations 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-Index Components

Many of the component series used to make up the diffusion indexes are shown in table 5. Where possible, recent basic data for the components are shown in part A. In part B, directions of change in these components are indicated for consecutive months and, depending upon the irregularity of the diffusion index, for either 6- or 9-month spans. The directions of change are indicated by "+" for rising, "o" for unchanged, and "-" for falling. (In counting the number of components rising, a "o" is counted as one-half.)

This table provides a convenient view of changing business conditions and is helpful in making an economic interpretation of the movements in the more highly aggregated statistical measures. That is, it shows which economic activities went up, which went down, and how long such movements have persisted. The table also helps 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 various series 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 whether the current cyclical phase is an expansion or contraction.

Expansions are compared in one way by measuring changes from the immediately preceding peak levels. In table 6 of this report, data for the latest month in the current expansion (shown by number of months from the February 1961 trough) are compared with the May 1960 reference peak. For each earlier expansion, data for a like period (same number of months from the trough of the expansion) are compared with the preceding reference peak. This type of comparison is designated as changes computed *from reference peak levels and reference trough dates*. This type of comparison shows whether, and by how much, the current level of activity exceeds or falls short of the level at the preceding business cycle peak, and how the current situation compares, in this respect, with earlier expansions. For those earlier periods of expansion that were shorter than the current one, the comparisons reflect the status at a point after a new contraction had set in.

Expansions are also compared by computing changes from reference trough levels and reference trough dates (table 7). For the current expansion, this type of comparison measures the extent of the rise from the trough level (February 1961) to the level at the current month. For each earlier expansion, data for a like period (same number of months from the trough of the expansion) are compared with the level at the trough. The same situation exists here as for the comparisons shown in table 6: For earlier expansions that were shorter than the current one, the comparisons show the status at a point after a new contraction had set in.

Contractions can be 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 changes from reference peak levels and reference peak dates. These comparisons will be made during a contraction period.

In addition to comparing cyclical fluctuations on the basis of reference dates, which are the same for all series, similar comparisons may be made using the specific peak and trough dates identified for each series. (Appendix B lists specific dates for a selected group of series.) Such comparisons would be based on changes from specific peak levels and specific trough dates and on changes from specific trough levels and specific trough dates. Although these specific cycle comparisons are not currently included in this report, they have been shown in previous issues.

Nearly all series have undergone changes in definition, coverage, or estimation procedure since 1919; therefore, the historical comparisons are to be considered only approximate. Furthermore, it is sometimes necessary to use data for a closely related series for cycles prior to the period covered by the series used currently. The principal substitutions of this type are as follows:

7. New private nonfarm dwelling units started (prior to 1948: Residential building contracts, floor space, by F. W. Dodge Corp.)
41. Number of employees in nonagricultural establishments (prior to 1929: Factory employment)
52. Personal income (prior to 1929: Quarterly data as published by Barger and Klein)
54. Sales of retail stores (prior to 1929: Department store sales)
62. Index of labor cost per unit of output, total manufacturing (prior to 1948: Production worker wage cost per unit).

CHARTS

Two types of charts are used to highlight the cyclical patterns of the business cycle series: Historical time series and cyclical comparisons.

Historical Time Series (charts 1 and 2)

These charts show cyclical fluctuations against the background of expansions and contractions in general business activity from 1948 to the current month. Shaded areas on the charts indicate periods of business cycle contractions between business cycle peak dates (beginnings of shaded areas) and business cycle trough dates (ends of shaded areas). The shading for a new contraction will be entered only after a trough has been designated.

Several different ratio and arithmetic scales are used to highlight the cyclical movements of the various series. The scale selected for each series is identified in the margin of the chart. Rates of change of various series can be compared with each other only where scales are identical. See the diagram, page 6, for additional help in using these charts.

Cyclical Comparisons (chart 3)

This chart compares the movements of selected series during the current business cycle with their movements through the corresponding phases of previous business cycles. Actually, it is an extension of the concept behind table 6. While table 6 makes a comparison at one point in time, chart 3 shows these comparisons over the course of the whole business cycle. These comparisons facilitate judgments on the vigor of the current expansion relative to behavior during the expansions of earlier cycles.

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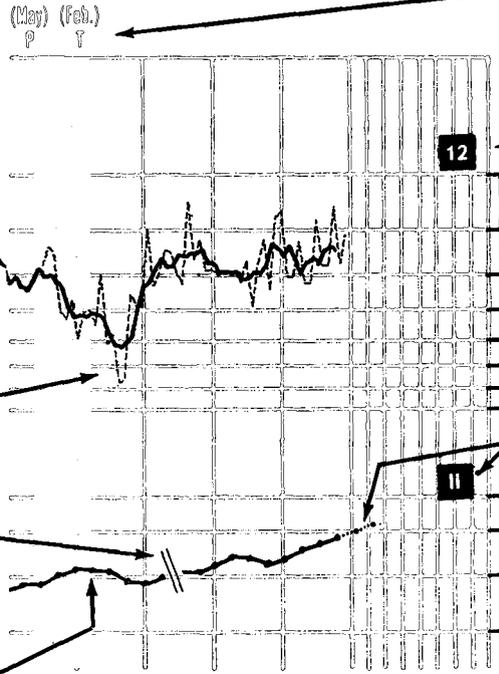
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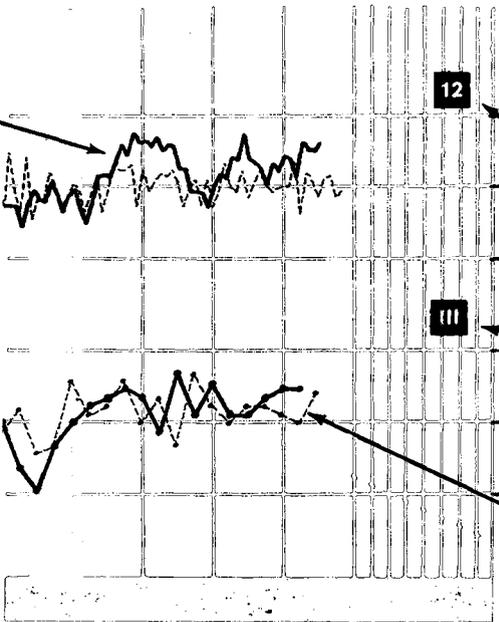
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Because of advance reporting and preliminary seasonal factors, the MCD's for current data are usually larger than those computed from historical series and shown in appendix C. MCD is usually computed for a fairly long period, one covering both expansions and contractions. Since the pace of change varies from phase to phase of the business cycle, such a measure will not provide an accurate estimate of the span over which to estimate cyclically significant changes at all times. Thus, MCD computed for the period 1953-63 is likely to be too high during the early stages of recovery when expansion has usually been rapid and too low during the late stages of expansion when the rate of advance has usually been small. This limitation should be borne in mind when making use of this measure.¹

ANALYTICAL MEASURES OF CURRENT CHANGE

Three kinds of analytical measures are presented—timing distributions, diffusion indexes, and directions of change. These measures aid in forming a judgment of the 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.

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. This timing distribution shows 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 presented 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 leading and roughly coincident business cycle indicators are scanned each month. During a business cycle expansion, the date of the high value for each series is recorded. (For inverted series—that is, series with negative conformity to the business cycle—dates of low values are taken.) 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 may be disregarded, although it is, of course, difficult to identify an erratic value, particularly for the current month.

The letter "H" is used in table 2 to identify and highlight the current high values during the expansion. The highs designated during the current cyclical phase will not necessarily be the specific cycle peaks. (See appendix B.) As new high levels are reached during the expansion, the current highs will be moved ahead. Comparisons of the current timing distributions with those for periods around earlier business cycle 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 simply reflect a short reversal in the upward movement.

Diffusion Indexes

Diffusion indexes are simple summary measures of groups of economic series. They express, for a given aggregate series, the percent of the series components

¹ For a more complete description of MCD and its use in studying economic series, see *Business Cycle Indicators*, Geoffrey H. Moore, editor; National Bureau of Economic Research, Inc., vol. 1, ch. 18, "Statistics for Short-Term Economic Forecasting," by Julius Shiskin (Princeton University Press: 1961).

which have risen over given spans 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 and widespread declines with sharp reductions in aggregate activity.

The diffusion indexes in this report are grouped according to the timing classification of the NBER. For monthly series, comparisons are made over 1-month spans (January-February, February-March, etc.) and generally for either 6- or 9-month spans, depending upon the irregularity of the series. The indexes based on 1-month spans are more "current" but they are also more irregular than the 6- or 9-month indexes. (See chart 2.) Quarterly series are compared over 1-quarter spans, 3-quarter spans, and 4-quarter spans.

Recent research has shown that the longer-span diffusion indexes are not only smoother, but have systematically larger amplitudes than the 1-month indexes. The 1-month indexes generally have large irregular fluctuations, but the movements may be significant when important changes are taking place, particularly around cyclical turning points. Since the longer-span diffusion indexes are centered, there is an apparent loss in currency equal to one-half the span; for example, 3 months in the case of a 6-month diffusion index. However, the most recent figure for a 6-month or longer-span index does provide the latest available information on changes *over that span*. If a significant reversal has taken place *within that span*, the 1-month indexes are likely to reveal it. Presentation of both 1-month and longer-span diffusion indexes provides an opportunity for the user to take advantage of the best features of each in interpreting current changes.

Series numbers preceded by the letter "D" designate diffusion indexes. When one of these numbers corresponds to the number of a basic indicator series, 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 6. Diffusion indexes not computed from basic series components are assigned new numbers.

Diffusion indexes that are based on business expectations 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-Index Components

Many of the component series used to make up the diffusion indexes are shown in table 5. Where possible, recent basic data for the components are shown in part A. In part B, directions of change in these components are indicated for consecutive months and, depending upon the irregularity of the diffusion index, for either 6- or 9-month spans. The directions of change are indicated by "+" for rising, "o" for unchanged, and "-" for falling. (In counting the number of components rising, a "o" is counted as one-half.)

This table provides a convenient view of changing business conditions and is helpful in making an economic interpretation of the movements in the more highly aggregated statistical measures. That is, it shows which economic activities went up, which went down, and how long such movements have persisted. The table also helps 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 various series 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 whether the current cyclical phase is an expansion or contraction.

Expansions are compared in one way by measuring changes from the immediately preceding peak levels. In table 6 of this report, data for the latest month in the current expansion (shown by number of months from the February 1961 trough) are compared with the May 1960 reference peak. For each earlier expansion, data for a like period (same number of months from the trough of the expansion) are compared with the preceding reference peak. This type of comparison is designated as changes computed *from reference peak levels and reference trough dates*. This type of comparison shows whether, and by how much, the current level of activity exceeds or falls short of the level at the preceding business cycle peak, and how the current situation compares, in this respect, with earlier expansions. For those earlier periods of expansion that were shorter than the current one, the comparisons reflect the status at a point after a new contraction had set in.

Expansions are also compared by computing changes *from reference trough levels and reference trough dates* (table 7). For the current expansion, this type of comparison measures the extent of the rise from the trough level (February 1961) to the level at the current month. For each earlier expansion, data for a like period (same number of months from the trough of the expansion) are compared with the level at the trough. The same situation exists here as for the comparisons shown in table 6: For earlier expansions that were shorter than the current one, the comparisons show the status at a point after a new contraction had set in.

Contractions can be 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 *changes from reference peak levels and reference peak dates*. These comparisons will be made during a contraction period.

In addition to comparing cyclical fluctuations on the basis of reference dates, which are the same for all series, similar comparisons may be made using the specific peak and trough dates identified for each series. (Appendix B lists specific dates for a selected group of series.) Such comparisons would be based on changes *from specific peak levels and specific trough dates* and on changes *from specific trough levels and specific trough dates*. Although these specific cycle comparisons are not currently included in this report, they have been shown in previous issues.

Nearly all series have undergone changes in definition, coverage, or estimation procedure since 1919; therefore, the historical comparisons are to be considered only approximate. Furthermore, it is sometimes necessary to use data for a closely related series for cycles prior to the period covered by the series used currently. The principal substitutions of this type are as follows:

7. New private nonfarm dwelling units started (prior to 1948: Residential building contracts, floor space, by F. W. Dodge Corp.)
41. Number of employees in nonagricultural establishments (prior to 1929: Factory employment)
52. Personal income (prior to 1929: Quarterly data as published by Barger and Klein)
54. Sales of retail stores (prior to 1929: Department store sales)
62. Index of labor cost per unit of output, total manufacturing (prior to 1948: Production worker wage cost per unit).

CHARTS

Two types of charts are used to highlight the cyclical patterns of the business cycle series: Historical time series and cyclical comparisons.

Historical Time Series (charts 1 and 2)

These charts show cyclical fluctuations against the background of expansions and contractions in general business activity from 1948 to the current month. Shaded areas on the charts indicate periods of business cycle contractions between business cycle peak dates (beginnings of shaded areas) and business cycle trough dates (ends of shaded areas). The shading for a new contraction will be entered only after a trough has been designated.

Several different ratio and arithmetic scales are used to highlight the cyclical movements of the various series. The scale selected for each series is identified in the margin of the chart. Rates of change of various series can be compared with each other only where scales are identical. See the diagram, page 6, for additional help in using these charts.

Cyclical Comparisons (chart 3)

This chart compares the movements of selected series during the current business cycle with their movements through the corresponding phases of previous business cycles. Actually, it is an extension of the concept behind table 6. While table 6 makes a comparison at one point in time, chart 3 shows these comparisons over the course of the whole business cycle. These comparisons facilitate judgments on the vigor of the current expansion relative to behavior during the expansions of earlier cycles.

Instead of following the usual date sequence, as in charts 1 and 2, the data in this chart are aligned according to the strategic points of the business cycle. Each of the included series is separated into four segments which encompass the three complete business cycles since 1948 and the current expansion. These segments are aligned so that the trough dates all fall at the same point on the horizontal scale and so that the levels of the preceding peaks all fall at the same point on the vertical scale.

A similar chart, based on specific cycle dates, was previously included in this report but has been discontinued for the present.

HOW TO READ CHARTS 1 AND 2

Peak (P) of cycle indicates end of expansion and beginning of Recession (shaded areas) as designated by NBER.

CHART 1 — Business Cycle Series

Trough (T) of cycle indicates end of recession and beginning of Expansion (white areas) as designated by NBER.

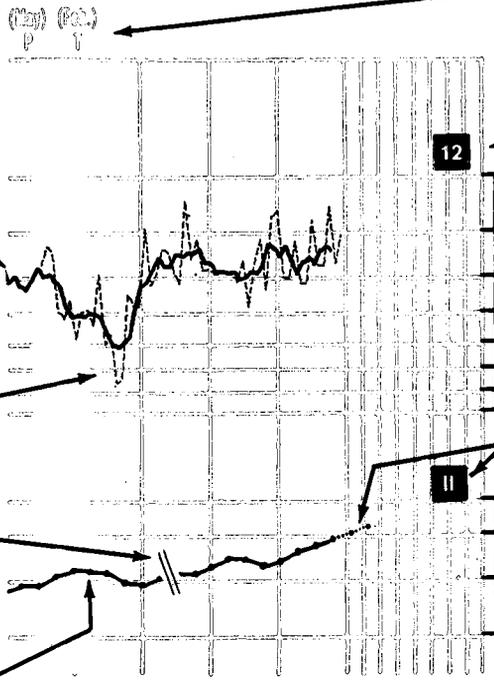
See back cover for complete titles and sources of series.

Solid line indicates monthly data. (Data may be actual monthly figures or MCD moving averages.*)

Broken line indicates actual monthly data for series where an MCD moving average* is plotted.

Parallel lines indicate a break in continuity (data not available, changes in series definitions, extreme values, etc.)

Solid line with plotting points indicates quarterly data.



Arabic number indicates latest month for which data are plotted. ("12" = December)

Roman number indicates latest quarter for which data are plotted. ("II" = second quarter)

Dotted line indicates anticipated data.

Various scales are used to highlight the patterns of the individual series. Series plotted to different scales are not directly comparable. "Scale A" is an arithmetic scale, "scale L-1" is a logarithmic scale with 1 cycle in a given distance, "scale L-2" is a logarithmic scale with 2 cycles in that distance, etc.

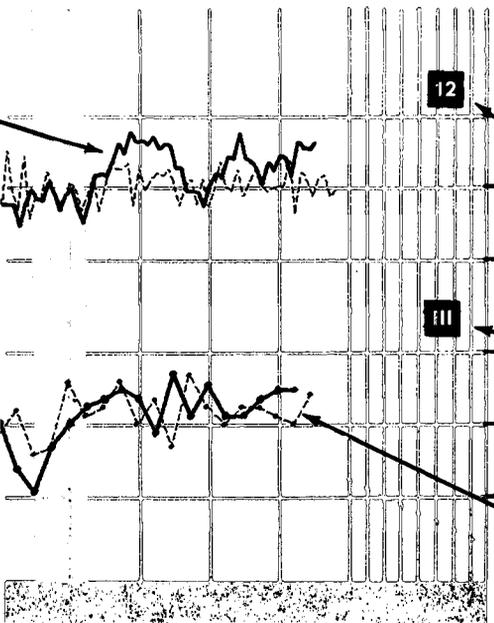
CHART 2 — Diffusion Indexes

Solid line indicates monthly data over 6- or 9-month spans.

Broken line indicates monthly data over 1-month spans.

Solid line with plotting points indicates quarterly data over various spans.

* Many of the more irregular series are shown in terms of their MCD moving averages as well as their actual monthly data. In such cases, the 4-, 5-, or 6-term moving averages are plotted 1½, 2, or 2½ months, respectively, behind the actual data. See page 2 for a description of MCD moving averages.



Scale shows percent of components rising.

Arabic number indicates latest month for which data are used in computing the indexes. ("12" = December)

Roman number indicates latest quarter for which data are used in computing the indexes. ("III" = third quarter)

Broken line with plotting points indicates quarterly data over various intervals. This line is also used to indicate anticipated quarterly data.

DESCRIPTIONS AND PROCEDURES

INTRODUCTION

Students of economic conditions describe the business cycle as consisting of alternating periods of expansion and contraction in production, employment, income, money flows, prices, and other economic processes. The fluctuations take place in a concerted manner, but not simultaneously. Once an expansion gets underway, it spreads from firm to firm, from industry to industry, from area to area, and from process to process, cumulating until a cyclical peak in aggregate activity is reached. Even while expansion is widespread during the upward phase of the business cycle, some activities continue to move in the opposite direction. Declines begin to spread as the expansion nears its peak and continue to spread even faster after the peak has been passed. But some activities continue to expand during the general contraction. Before long these expansions become stronger and more widespread. When they begin to dominate the situation, the upturn in aggregate activity has arrived and a new expansion is underway. This sequence is recurrent, but not periodic.

The causal relations among these various economic processes are primarily responsible for the cumulative nature of cyclical forces, and explain why expansion eventually turns into recession and recession into expansion. Cyclical fluctuations in production and employment are preceded by fluctuations in measures which relate to future rather than to current production—measures such as new orders for durable goods, the formation of new business enterprises, and accessions to payrolls. They are followed by fluctuations in various types of economic costs, such as labor costs, interest rates, fulfillment of long-term commitments, and holdings of inventories and of debts.

Although this pattern has been characteristic of American economic history, today many economists do not consider it inevitable.

Intensive research by the National Bureau of Economic Research (NBER) over many years has provided a list of those significant series that usually lead, those that usually move with, and those that usually lag behind cyclical movements in aggregate economic ac-

tivity. The series have been grouped and classified by the NBER as “leading”, “roughly coincident”, or “lagging” indicators. These indicators are defined as follows:

- ▷ *NBER Leading Indicators.*—Series that usually reach peaks or troughs before those in aggregate economic activity as measured by the roughly coincident series (see below). One group of these series pertains to activities in the labor market, another to orders and contracts, and so on.
- ▷ *NBER Roughly Coincident Indicators.*—Series that are direct measures of aggregate economic activity or move roughly together with it; for example, nonagricultural employment, industrial production, and retail sales.
- ▷ *NBER Lagging Indicators.*—Series, such as new plant and equipment expenditures and manufacturers’ inventories, that usually reach turning points after they are reached in aggregate economic activity.

Other U.S. series with business cycle significance are included in this report. 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.

The list of series covered and sources of the basic data are shown on the back cover of this report. Series numbers are for identification only and do not reflect series relationships or order.

METHOD OF PRESENTATION

Data are shown in this report in three general categories, as follows:

- ▷ *Basic Data* (chart 1 and tables 1 and 2).—Data are shown for business cycle indicators, additional

U.S. series with business cycle significance, and industrial production indexes for selected countries. 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 (chart 2 and tables 3 to 5).— These are measures that aid in forming a judgment of the imminence of a turning point in the business cycle, determining the extent of current changes in different parts of the economy, and pointing to developments in particular industries and places.

Cyclical Patterns (chart 3 and tables 6 and 7).— Current cyclical levels are compared with levels 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.

DESIGNATION OF BUSINESS CYCLE TURNING POINTS

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

Monthly business cycle peaks and troughs have been dated by the NBER for the period 1854-1961. Over this span, expansion has prevailed 61 percent of the time and contraction, 39 percent. If war periods are disregarded, expansion has prevailed 56 percent of the time and contraction, 44 percent.

SEASONAL AND RELATED STATISTICAL ADJUSTMENTS

Adjustments for normal seasonal fluctuations are often necessary to bring out the underlying cyclical trends of a series. Such adjustments allow for periodic intra-year variations resulting chiefly from normal differences in weather conditions during the year and from various institutional arrangements. Some series contain considerable variation attributable to the number of working or trading days in each month. An additional adjustment is necessary in such cases to reduce this variation. Variations due to holidays are usually accounted for by the seasonal adjustment process; how-

ever, there are some cases in which a separate holiday adjustment is necessary for holidays with variable dates. Such a case is retail sales of apparel which is affected strongly by the date of Easter and, to a lesser degree, by the dates of Labor Day and Thanksgiving.

In general, the seasonal adjustment process is designed to adjust for *average* weather conditions but not for the dispersion about that average. Thus, some seasonally adjusted series, such as housing starts, will tend to be low in months of unusually bad weather and high during unusually good weather. At the Bureau of the Census, studies have been started on some series to determine the effects of abnormal weather. Although it eventually may be possible, Census methods do not at present make any adjustments for such variations.

Most of the series contained in this report are presented in seasonally adjusted form. Unadjusted data are used only for those series which appear to have no pattern of seasonal variation. (Unadjusted series are identified in table 2.) In most cases, the seasonally adjusted data used for a series are the official figures released by the source agency; therefore, several different methods of seasonal adjustment are involved. In addition, 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. For these series, seasonal adjustments have been developed by either the NBER or the Census Bureau. The adjustment factors for these series, derived by Census Method II, are shown in appendix D. Factors for series which are the sums of seasonally adjusted components or which are based on unpublished source data are not shown.

MCD MOVING AVERAGES

MCD (months for cyclical dominance) is an estimate of the appropriate span over which to observe the cyclical movements in a monthly series. This span is usually longer than a single month because month-to-month changes are often dominated by erratic movements, but shorter than the frequently used 12-month span (change from the same month a year ago), and is different for different series (see appendix C for MCD values and method of computation).

MCD is, on average, the first span of months for which the average change for the cyclical factor is greater than that of the irregular factor and remains so. It is small for smooth series and large for irregular series. The month-to-month differences between moving averages of the period equal to MCD are commensurate with the differences between seasonally

adjusted values separated by the same MCD span; thus, the month-to-month differences in a 3-month moving average are commensurate with differences in seasonally adjusted values over 3-month spans. MCD moving averages all have about the same degree of smoothness. Consequently, MCD moving averages of highly irregular series, such as business failures and Federal cash payments, will show their cyclical movements about as clearly as the seasonally adjusted data for such smooth series as industrial production.

MCD moving averages are shown in chart 1 for all series with an MCD of "5" or more. To provide an indication of the variation about these moving averages, seasonally adjusted data are also plotted beginning with 1958. Although not so smooth as more powerful moving averages (such as the weighted 13-term Henderson curve), the MCD curve is more current and has a smaller rounding bias around business cycle peaks and troughs. On balance, the MCD curve seems to offer a reasonable compromise in terms of currency, smoothness, and fidelity to the patterns of business cycle fluctuations.

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The letter "H" is used in table 2 to identify and highlight the current high values during the expansion. The highs designated during the current cyclical phase will not necessarily be the specific cycle peaks. (See appendix B.) As new high levels are reached during the expansion, the current highs will be moved ahead. Comparisons of the current timing distributions with those for periods around earlier business cycle peaks are helpful for appraising the evidence of a prospective business cycle turning point.

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Series numbers preceded by the letter "D" designate diffusion indexes. When one of these numbers corresponds to the number of a basic indicator series, 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 6. Diffusion indexes not computed from basic series components are assigned new numbers.

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Contractions can be 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 changes from reference peak levels and reference peak dates. These comparisons will be made during a contraction period.

In addition to comparing cyclical fluctuations on the basis of reference dates, which are the same for all series, similar comparisons may be made using the specific peak and trough dates identified for each series. (Appendix B lists specific dates for a selected group of series.) Such comparisons would be based on changes from specific peak levels and specific trough dates and on changes from specific trough levels and specific trough dates. Although these specific cycle comparisons are not currently included in this report, they have been shown in previous issues.

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These charts show cyclical fluctuations against the background of expansions and contractions in general business activity from 1948 to the current month. Shaded areas on the charts indicate periods of business cycle contractions between business cycle peak dates (beginnings of shaded areas) and business cycle trough dates (ends of shaded areas). The shading for a new contraction will be entered only after a trough has been designated.

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Cyclical Comparisons (chart 3)

This chart compares the movements of selected series during the current business cycle with their movements through the corresponding phases of previous business cycles. Actually, it is an extension of the concept behind table 6. While table 6 makes a comparison at one point in time, chart 3 shows these comparisons over the course of the whole business cycle. These comparisons facilitate judgments on the vigor of the current expansion relative to behavior during the expansions of earlier cycles.

Instead of following the usual date sequence, as in charts 1 and 2, the data in this chart are alined according to the strategic points of the business cycle. Each of the included series is separated into four segments which encompass the three complete business cycles since 1948 and the current expansion. These segments are alined so that the trough dates all fall at the same point on the horizontal scale and so that the levels of the preceding peaks all fall at the same point on the vertical scale.

A similar chart, based on specific cycle dates, was previously included in this report but has been discontinued for the present.

Peak (P) of cycle indicates end of expansion and beginning of Recession (shaded areas) as designated by NBER.

CHART 1 — Business Cycle Series

Trough (T) of cycle indicates end of recession and beginning of Expansion (white areas) as designated by NBER.

See back cover for complete titles and sources of series.

Solid line indicates monthly data. (Data may be actual monthly figures or MCD moving averages.*)

Broken line indicates actual monthly data for series where an MCD moving average* is plotted.

Parallel lines indicate a break in continuity (data not available, changes in series definitions, extreme values, etc.)

Solid line with plotting points indicates quarterly data.

Arabic number indicates latest month for which data are plotted. ("12" = December)

Roman number indicates latest quarter for which data are plotted. ("II" = second quarter)

Dotted line indicates anticipated data.

Various scales are used to highlight the patterns of the individual series. Series plotted to different scales are not directly comparable. "Scale A" is an arithmetic scale, "scale L-1" is a logarithmic scale with 1 cycle in a given distance, "scale L-2" is a logarithmic scale with 2 cycles in that distance, etc.

CHART 2 — Diffusion Indexes

Solid line indicates monthly data over 6- or 9-month spans.

Broken line indicates monthly data over 1-month spans.

Solid line with plotting points indicates quarterly data over various spans.

* Many of the more irregular series are shown in terms of their MCD moving averages as well as their actual monthly data. In such cases, the 4-, 5-, or 6-term moving averages are plotted 1½, 2, or 2½ months, respectively, behind the actual data. See page 2 for a description of MCD moving averages.

Scale shows percent of components rising.

Arabic number indicates latest month for which data are used in computing the indexes. ("12" = December)

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DESCRIPTIONS AND PROCEDURES

INTRODUCTION

Students of economic conditions describe the business cycle as consisting of alternating periods of expansion and contraction in production, employment, income, money flows, prices, and other economic processes. The fluctuations take place in a concerted manner, but not simultaneously. Once an expansion gets underway, it spreads from firm to firm, from industry to industry, from area to area, and from process to process, cumulating until a cyclical peak in aggregate activity is reached. Even while expansion is widespread during the upward phase of the business cycle, some activities continue to move in the opposite direction. Declines begin to spread as the expansion nears its peak and continue to spread even faster after the peak has been passed. But some activities continue to expand during the general contraction. Before long these expansions become stronger and more widespread. When they begin to dominate the situation, the upturn in aggregate activity has arrived and a new expansion is underway. This sequence is recurrent, but not periodic.

The causal relations among these various economic processes are primarily responsible for the cumulative nature of cyclical forces, and explain why expansion eventually turns into recession and recession into expansion. Cyclical fluctuations in production and employment are preceded by fluctuations in measures which relate to future rather than to current production—measures such as new orders for durable goods, the formation of new business enterprises, and accessions to payrolls. They are followed by fluctuations in various types of economic costs, such as labor costs, interest rates, fulfillment of long-term commitments, and holdings of inventories and of debts.

Although this pattern has been characteristic of American economic history, today many economists do not consider it inevitable.

Intensive research by the National Bureau of Economic Research (NBER) over many years has provided a list of those significant series that usually lead, those that usually move with, and those that usually lag behind cyclical movements in aggregate economic ac-

tivity. The series have been grouped and classified by the NBER as "leading", "roughly coincident", or "lagging" indicators. These indicators are defined as follows:

- ▷ *NBER Leading Indicators.*—Series that usually reach peaks or troughs before those in aggregate economic activity as measured by the roughly coincident series (see below). One group of these series pertains to activities in the labor market, another to orders and contracts, and so on.
- ▷ *NBER Roughly Coincident Indicators.*—Series that are direct measures of aggregate economic activity or move roughly together with it; for example, nonagricultural employment, industrial production, and retail sales.
- ▷ *NBER Lagging Indicators.*—Series, such as new plant and equipment expenditures and manufacturers' inventories, that usually reach turning points after they are reached in aggregate economic activity.

Other U.S. series with business cycle significance are included in this report. 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.

The list of series covered and sources of the basic data are shown on the back cover of this report. Series numbers are for identification only and do not reflect series relationships or order.

METHOD OF PRESENTATION.

Data are shown in this report in three general categories, as follows:

- ▷ *Basic Data* (chart 1 and tables 1 and 2).—Data are shown for business cycle indicators, additional

U.S. series with business cycle significance, and industrial production indexes for selected countries. 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* (chart 2 and tables 3 to 5).— These are measures that aid in forming a judgment of the imminence of a turning point in the business cycle, determining the extent of current changes in different parts of the economy, and pointing to developments in particular industries and places.
- ▷ *Cyclical Patterns* (chart 3 and tables 6 and 7).— Current cyclical levels are compared with levels 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.

DESIGNATION OF BUSINESS CYCLE TURNING POINTS

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

Monthly business cycle peaks and troughs have been dated by the NBER for the period 1854-1961. Over this span, expansion has prevailed 61 percent of the time and contraction, 39 percent. If war periods are disregarded, expansion has prevailed 56 percent of the time and contraction, 44 percent.

SEASONAL AND RELATED STATISTICAL ADJUSTMENTS

Adjustments for normal seasonal fluctuations are often necessary to bring out the underlying cyclical trends of a series. Such adjustments allow for periodic intra-year variations resulting chiefly from normal differences in weather conditions during the year and from various institutional arrangements. Some series contain considerable variation attributable to the number of working or trading days in each month. An additional adjustment is necessary in such cases to reduce this variation. Variations due to holidays are usually accounted for by the seasonal adjustment process; how-

ever, there are some cases in which a separate holiday adjustment is necessary for holidays with variable dates. Such a case is retail sales of apparel which is affected strongly by the date of Easter and, to a lesser degree, by the dates of Labor Day and Thanksgiving.

In general, the seasonal adjustment process is designed to adjust for *average* weather conditions but not for the dispersion about that average. Thus, some seasonally adjusted series, such as housing starts, will tend to be low in months of unusually bad weather and high during unusually good weather. At the Bureau of the Census, studies have been started on some series to determine the effects of abnormal weather. Although it eventually may be possible, Census methods do not at present make any adjustments for such variations.

Most of the series contained in this report are presented in seasonally adjusted form. Unadjusted data are used only for those series which appear to have no pattern of seasonal variation. (Unadjusted series are identified in table 2.) In most cases, the seasonally adjusted data used for a series are the official figures released by the source agency; therefore, several different methods of seasonal adjustment are involved. In addition, 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. For these series, seasonal adjustments have been developed by either the NBER or the Census Bureau. The adjustment factors for these series, derived by Census Method II, are shown in appendix D. Factors for series which are the sums of seasonally adjusted components or which are based on unpublished source data are not shown.

MCD MOVING AVERAGES

MCD (months for cyclical dominance) is an estimate of the appropriate span over which to observe the cyclical movements in a monthly series. This span is usually longer than a single month because month-to-month changes are often dominated by erratic movements, but shorter than the frequently used 12-month span (change from the same month a year ago), and is different for different series (see appendix C for MCD values and method of computation).

MCD is, on average, the first span of months for which the average change for the cyclical factor is greater than that of the irregular factor and remains so. It is small for smooth series and large for irregular series. The month-to-month differences between moving averages of the period equal to MCD are commensurate with the differences between seasonally

adjusted values separated by the same MCD span; thus, the month-to-month differences in a 3-month moving average are commensurate with differences in seasonally adjusted values over 3-month spans. MCD moving averages all have about the same degree of smoothness. Consequently, MCD moving averages of highly irregular series, such as business failures and Federal cash payments, will show their cyclical movements about as clearly as the seasonally adjusted data for such smooth series as industrial production.

MCD moving averages are shown in chart 1 for all series with an MCD of "5" or more. To provide an indication of the variation about these moving averages, seasonally adjusted data are also plotted beginning with 1958. Although not so smooth as more powerful moving averages (such as the weighted 13-term Henderson curve), the MCD curve is more current and has a smaller rounding bias around business cycle peaks and troughs. On balance, the MCD curve seems to offer a reasonable compromise in terms of currency, smoothness, and fidelity to the patterns of business cycle fluctuations.

Because of advance reporting and preliminary seasonal factors, the MCD's for current data are usually larger than those computed from historical series and shown in appendix C. MCD is usually computed for a fairly long period, one covering both expansions and contractions. Since the pace of change varies from phase to phase of the business cycle, such a measure will not provide an accurate estimate of the span over which to estimate cyclically significant changes at all times. Thus, MCD computed for the period 1953-63 is likely to be too high during the early stages of recovery when expansion has usually been rapid and too low during the late stages of expansion when the rate of advance has usually been small. This limitation should be borne in mind when making use of this measure.¹

ANALYTICAL MEASURES OF CURRENT CHANGE

Three kinds of analytical measures are presented—timing distributions, diffusion indexes, and directions of change. These measures aid in forming a judgment of the 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.

¹ For a more complete description of MCD and its use in studying economic series, see *Business Cycle Indicators*, Geoffrey H. Moore, editor; National Bureau of Economic Research, Inc., vol. 1, ch. 18, "Statistics for Short-Term Economic Forecasting," by Julius Shiskin (Princeton University Press: 1961).

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. This timing distribution shows 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 presented 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 leading and roughly coincident business cycle indicators are scanned each month. During a business cycle expansion, the date of the high value for each series is recorded. (For inverted series—that is, series with negative conformity to the business cycle—dates of low values are taken.) 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 may be disregarded, although it is, of course, difficult to identify an erratic value, particularly for the current month.

The letter "H" is used in table 2 to identify and highlight the current high values during the expansion. The highs designated during the current cyclical phase will not necessarily be the specific cycle peaks. (See appendix B.) As new high levels are reached during the expansion, the current highs will be moved ahead. Comparisons of the current timing distributions with those for periods around earlier business cycle 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 simply reflect a short reversal in the upward movement.

Diffusion Indexes

Diffusion indexes are simple summary measures of groups of economic series. They express, for a given aggregate series, the percent of the series components

which have risen over given spans 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 and widespread declines with sharp reductions in aggregate activity.

The diffusion indexes in this report are grouped according to the timing classification of the NBER. For monthly series, comparisons are made over 1-month spans (January-February, February-March, etc.) and generally for either 6- or 9-month spans, depending upon the irregularity of the series. The indexes based on 1-month spans are more "current" but they are also more irregular than the 6- or 9-month indexes. (See chart 2.) Quarterly series are compared over 1-quarter spans, 3-quarter spans, and 4-quarter spans.

Recent research has shown that the longer-span diffusion indexes are not only smoother, but have systematically larger amplitudes than the 1-month indexes. The 1-month indexes generally have large irregular fluctuations, but the movements may be significant when important changes are taking place, particularly around cyclical turning points. Since the longer-span diffusion indexes are centered, there is an apparent loss in currency equal to one-half the span; for example, 3 months in the case of a 6-month diffusion index. However, the most recent figure for a 6-month or longer-span index does provide the latest available information on changes *over that span*. If a significant reversal has taken place *within that span*, the 1-month indexes are likely to reveal it. Presentation of both 1-month and longer-span diffusion indexes provides an opportunity for the user to take advantage of the best features of each in interpreting current changes.

Series numbers preceded by the letter "D" designate diffusion indexes. When one of these numbers corresponds to the number of a basic indicator series, 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 6. Diffusion indexes not computed from basic series components are assigned new numbers.

Diffusion indexes that are based on business expectations 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-Index Components

Many of the component series used to make up the diffusion indexes are shown in table 5. Where possible, recent basic data for the components are shown in part A. In part B, directions of change in these components are indicated for consecutive months and, depending upon the irregularity of the diffusion index, for either 6- or 9-month spans. The directions of change are indicated by "+" for rising, "o" for unchanged, and "-" for falling. (In counting the number of components rising, a "o" is counted as one-half.)

This table provides a convenient view of changing business conditions and is helpful in making an economic interpretation of the movements in the more highly aggregated statistical measures. That is, it shows which economic activities went up, which went down, and how long such movements have persisted. The table also helps 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 various series 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 whether the current cyclical phase is an expansion or contraction.

Expansions are compared in one way by measuring changes from the immediately preceding peak levels. In table 6 of this report, data for the latest month in the current expansion (shown by number of months from the February 1961 trough) are compared with the May 1960 reference peak. For each earlier expansion, data for a like period (same number of months from the trough of the expansion) are compared with the preceding reference peak. This type of comparison is designated as changes computed *from reference peak levels and reference trough dates*. This type of comparison shows whether, and by how much, the current level of activity exceeds or falls short of the level at the preceding business cycle peak, and how the current situation compares, in this respect, with earlier expansions. For those earlier periods of expansion that were shorter than the current one, the comparisons reflect the status at a point after a new contraction had set in.

Expansions are also compared by computing changes from *reference trough levels and reference trough dates* (table 7). For the current expansion, this type of comparison measures the extent of the rise from the trough level (February 1961) to the level at the current month. For each earlier expansion, data for a like period (same number of months from the trough of the expansion) are compared with the level at the trough. The same situation exists here as for the comparisons shown in table 6: For earlier expansions that were shorter than the current one, the comparisons show the status at a point after a new contraction had set in.

Contractions can be 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 changes from *reference peak levels and reference peak dates*. These comparisons will be made during a contraction period.

In addition to comparing cyclical fluctuations on the basis of reference dates, which are the same for all series, similar comparisons may be made using the specific peak and trough dates identified for each series. (Appendix B lists specific dates for a selected group of series.) Such comparisons would be based on changes from *specific peak levels and specific trough dates* and on changes from *specific trough levels and specific trough dates*. Although these specific cycle comparisons are not currently included in this report, they have been shown in previous issues.

Nearly all series have undergone changes in definition, coverage, or estimation procedure since 1919; therefore, the historical comparisons are to be considered only approximate. Furthermore, it is sometimes necessary to use data for a closely related series for cycles prior to the period covered by the series used currently. The principal substitutions of this type are as follows:

7. New private nonfarm dwelling units started (prior to 1948: Residential building contracts, floor space, by F. W. Dodge Corp.)
41. Number of employees in nonagricultural establishments (prior to 1929: Factory employment)
52. Personal income (prior to 1929: Quarterly data as published by Barger and Klein)
54. Sales of retail stores (prior to 1929: Department store sales)
62. Index of labor cost per unit of output, total manufacturing (prior to 1948: Production worker wage cost per unit).

CHARTS

Two types of charts are used to highlight the cyclical patterns of the business cycle series: Historical time series and cyclical comparisons.

Historical Time Series (charts 1 and 2)

These charts show cyclical fluctuations against the background of expansions and contractions in general business activity from 1948 to the current month. Shaded areas on the charts indicate periods of business cycle contractions between business cycle peak dates (beginnings of shaded areas) and business cycle trough dates (ends of shaded areas). The shading for a new contraction will be entered only after a trough has been designated.

Several different ratio and arithmetic scales are used to highlight the cyclical movements of the various series. The scale selected for each series is identified in the margin of the chart. Rates of change of various series can be compared with each other only where scales are identical. See the diagram, page 6, for additional help in using these charts.

Cyclical Comparisons (chart 3)

This chart compares the movements of selected series during the current business cycle with their movements through the corresponding phases of previous business cycles. Actually, it is an extension of the concept behind table 6. While table 6 makes a comparison at one point in time, chart 3 shows these comparisons over the course of the whole business cycle. These comparisons facilitate judgments on the vigor of the current expansion relative to behavior during the expansions of earlier cycles.

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HOW TO READ CHARTS 1 AND 2

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CHART 1 — Business Cycle Series

See back cover for complete titles and sources of series.

Solid line indicates monthly data. (Data may be actual monthly figures or MCD moving averages.*)

Broken line indicates actual monthly data for series where an MCD moving average * is plotted.

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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. This timing distribution shows 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 presented 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 leading and roughly coincident business cycle indicators are scanned each month. During a business cycle expansion, the date of the high value for each series is recorded. (For inverted series—that is, series with negative conformity to the business cycle—dates of low values are taken.) 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 may be disregarded, although it is, of course, difficult to identify an erratic value, particularly for the current month.

The letter "H" is used in table 2 to identify and highlight the current high values during the expansion. The highs designated during the current cyclical phase will not necessarily be the specific cycle peaks. (See appendix B.) As new high levels are reached during the expansion, the current highs will be moved ahead. Comparisons of the current timing distributions with those for periods around earlier business cycle 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 simply reflect a short reversal in the upward movement.

Diffusion Indexes

Diffusion indexes are simple summary measures of groups of economic series. They express, for a given aggregate series, the percent of the series components

which have risen over given spans 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 and widespread declines with sharp reductions in aggregate activity.

The diffusion indexes in this report are grouped according to the timing classification of the NBER. For monthly series, comparisons are made over 1-month spans (January-February, February-March, etc.) and generally for either 6- or 9-month spans, depending upon the irregularity of the series. The indexes based on 1-month spans are more "current" but they are also more irregular than the 6- or 9-month indexes. (See chart 2.) Quarterly series are compared over 1-quarter spans, 3-quarter spans, and 4-quarter spans.

Recent research has shown that the longer-span diffusion indexes are not only smoother, but have systematically larger amplitudes than the 1-month indexes. The 1-month indexes generally have large irregular fluctuations, but the movements may be significant when important changes are taking place, particularly around cyclical turning points. Since the longer-span diffusion indexes are centered, there is an apparent loss in currency equal to one-half the span; for example, 3 months in the case of a 6-month diffusion index. However, the most recent figure for a 6-month or longer-span index does provide the latest available information on changes *over that span*. If a significant reversal has taken place *within that span*, the 1-month indexes are likely to reveal it. Presentation of both 1-month and longer-span diffusion indexes provides an opportunity for the user to take advantage of the best features of each in interpreting current changes.

Series numbers preceded by the letter "D" designate diffusion indexes. When one of these numbers corresponds to the number of a basic indicator series, 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 6. Diffusion indexes not computed from basic series components are assigned new numbers.

Diffusion indexes that are based on business expectations 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-Index Components

Many of the component series used to make up the diffusion indexes are shown in table 5. Where possible, recent basic data for the components are shown in part A. In part B, directions of change in these components are indicated for consecutive months and, depending upon the irregularity of the diffusion index, for either 6- or 9-month spans. The directions of change are indicated by "+" for rising, "o" for unchanged, and "-" for falling. (In counting the number of components rising, a "o" is counted as one-half.)

This table provides a convenient view of changing business conditions and is helpful in making an economic interpretation of the movements in the more highly aggregated statistical measures. That is, it shows which economic activities went up, which went down, and how long such movements have persisted. The table also helps 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 various series 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 whether the current cyclical phase is an expansion or contraction.

Expansions are compared in one way by measuring changes from the immediately preceding peak levels. In table 6 of this report, data for the latest month in the current expansion (shown by number of months from the February 1961 trough) are compared with the May 1960 reference peak. For each earlier expansion, data for a like period (same number of months from the trough of the expansion) are compared with the preceding reference peak. This type of comparison is designated as changes computed *from reference peak levels and reference trough dates*. This type of comparison shows whether, and by how much, the current level of activity exceeds or falls short of the level at the preceding business cycle peak, and how the current situation compares, in this respect, with earlier expansions. For those earlier periods of expansion that were shorter than the current one, the comparisons reflect the status at a point after a new contraction had set in.

Expansions are also compared by computing changes from reference trough levels and reference trough dates (table 7). For the current expansion, this type of comparison measures the extent of the rise from the trough level (February 1961) to the level at the current month. For each earlier expansion, data for a like period (same number of months from the trough of the expansion) are compared with the level at the trough. The same situation exists here as for the comparisons shown in table 6: For earlier expansions that were shorter than the current one, the comparisons show the status at a point after a new contraction had set in.

Contractions can be 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 changes from reference peak levels and reference peak dates. These comparisons will be made during a contraction period.

In addition to comparing cyclical fluctuations on the basis of reference dates, which are the same for all series, similar comparisons may be made using the specific peak and trough dates identified for each series. (Appendix B lists specific dates for a selected group of series.) Such comparisons would be based on changes from specific peak levels and specific trough dates and on changes from specific trough levels and specific trough dates. Although these specific cycle comparisons are not currently included in this report, they have been shown in previous issues.

Nearly all series have undergone changes in definition, coverage, or estimation procedure since 1919; therefore, the historical comparisons are to be considered only approximate. Furthermore, it is sometimes necessary to use data for a closely related series for cycles prior to the period covered by the series used currently. The principal substitutions of this type are as follows:

7. New private nonfarm dwelling units started (prior to 1948: Residential building contracts, floor space, by F. W. Dodge Corp.)
41. Number of employees in nonagricultural establishments (prior to 1929: Factory employment)
52. Personal income (prior to 1929: Quarterly data as published by Barger and Klein)
54. Sales of retail stores (prior to 1929: Department store sales)
62. Index of labor cost per unit of output, total manufacturing (prior to 1948: Production worker wage cost per unit).

CHARTS

Two types of charts are used to highlight the cyclical patterns of the business cycle series: Historical time series and cyclical comparisons.

Historical Time Series (charts 1 and 2)

These charts show cyclical fluctuations against the background of expansions and contractions in general business activity from 1948 to the current month. Shaded areas on the charts indicate periods of business cycle contractions between business cycle peak dates (beginnings of shaded areas) and business cycle trough dates (ends of shaded areas). The shading for a new contraction will be entered only after a trough has been designated.

Several different ratio and arithmetic scales are used to highlight the cyclical movements of the various series. The scale selected for each series is identified in the margin of the chart. Rates of change of various series can be compared with each other only where scales are identical. See the diagram, page 6, for additional help in using these charts.

Cyclical Comparisons (chart 3)

This chart compares the movements of selected series during the current business cycle with their movements through the corresponding phases of previous business cycles. Actually, it is an extension of the concept behind table 6. While table 6 makes a comparison at one point in time, chart 3 shows these comparisons over the course of the whole business cycle. These comparisons facilitate judgments on the vigor of the current expansion relative to behavior during the expansions of earlier cycles.

Instead of following the usual date sequence, as in charts 1 and 2, the data in this chart are alined according to the strategic points of the business cycle. Each of the included series is separated into four segments which encompass the three complete business cycles since 1948 and the current expansion. These segments are alined so that the trough dates all fall at the same point on the horizontal scale and so that the levels of the preceding peaks all fall at the same point on the vertical scale.

A similar chart, based on specific cycle dates, was previously included in this report but has been discontinued for the present.

HOW TO READ CHARTS 1 AND 2

Peak (P) of cycle indicates end of expansion and beginning of Recession (shaded areas) as designated by NBER.

CHART 1 — Business Cycle Series

Trough (T) of cycle indicates end of recession and beginning of Expansion (white areas) as designated by NBER.

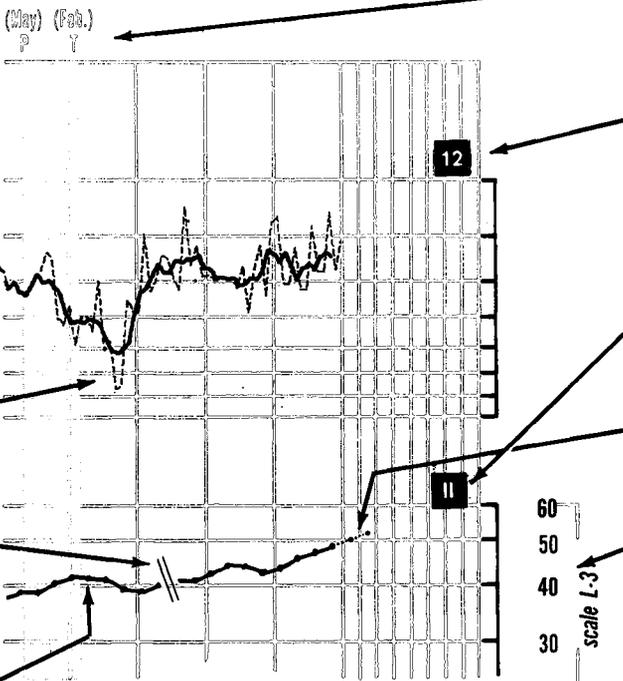
See back cover for complete titles and sources of series.

Solid line indicates monthly data. (Data may be actual monthly figures or MCD moving averages.*)

Broken line indicates actual monthly data for series where an MCD moving average* is plotted.

Parallel lines indicate a break in continuity (data not available, changes in series definitions, extreme values, etc.)

Solid line with plotting points indicates quarterly data.



Arabic number indicates latest month for which data are plotted. ("12" = December)

Roman number indicates latest quarter for which data are plotted. ("II" = second quarter)

Dotted line indicates anticipated data.

Various scales are used to highlight the patterns of the individual series. Series plotted to different scales are not directly comparable. "Scale A" is an arithmetic scale, "scale L-1" is a logarithmic scale with 1 cycle in a given distance, "scale L-2" is a logarithmic scale with 2 cycles in that distance, etc.

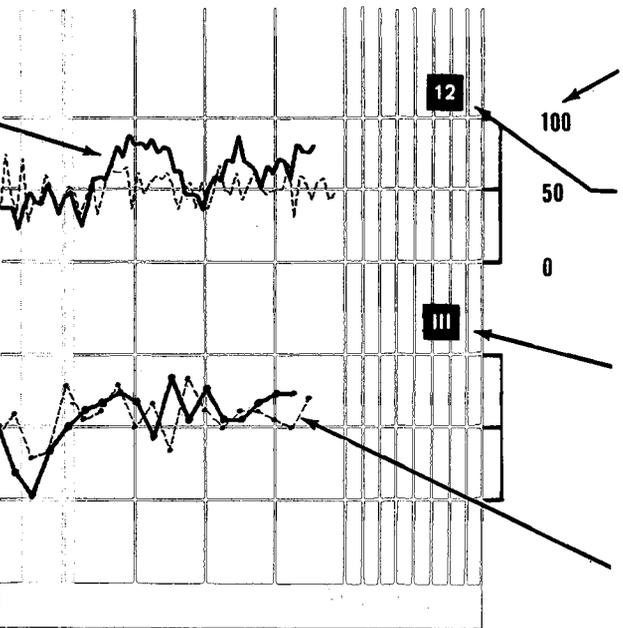
CHART 2 — Diffusion Indexes

Solid line indicates monthly data over 6- or 9-month spans.

Broken line indicates monthly data over 1-month spans.

Solid line with plotting points indicates quarterly data over various spans.

* Many of the more irregular series are shown in terms of their MCD moving averages as well as their actual monthly data. In such cases, the 4-, 5-, or 6-term moving averages are plotted 1½, 2, or 2½ months, respectively, behind the actual data. See page 2 for a description of MCD moving averages.



Scale shows percent of components rising.

Arabic number indicates latest month for which data are used in computing the indexes. ("12" = December)

Roman number indicates latest quarter for which data are used in computing the indexes. ("III" = third quarter)

Broken line with plotting points indicates quarterly data over various intervals. This line is also used to indicate anticipated quarterly data.

DESCRIPTIONS AND PROCEDURES

INTRODUCTION

Students of economic conditions describe the business cycle as consisting of alternating periods of expansion and contraction in production, employment, income, money flows, prices, and other economic processes. The fluctuations take place in a concerted manner, but not simultaneously. Once an expansion gets underway, it spreads from firm to firm, from industry to industry, from area to area, and from process to process, cumulating until a cyclical peak in aggregate activity is reached. Even while expansion is widespread during the upward phase of the business cycle, some activities continue to move in the opposite direction. Declines begin to spread as the expansion nears its peak and continue to spread even faster after the peak has been passed. But some activities continue to expand during the general contraction. Before long these expansions become stronger and more widespread. When they begin to dominate the situation, the upturn in aggregate activity has arrived and a new expansion is underway. This sequence is recurrent, but not periodic.

The causal relations among these various economic processes are primarily responsible for the cumulative nature of cyclical forces, and explain why expansion eventually turns into recession and recession into expansion. Cyclical fluctuations in production and employment are preceded by fluctuations in measures which relate to future rather than to current production—measures such as new orders for durable goods, the formation of new business enterprises, and accessions to payrolls. They are followed by fluctuations in various types of economic costs, such as labor costs, interest rates, fulfillment of long-term commitments, and holdings of inventories and of debts.

Although this pattern has been characteristic of American economic history, today many economists do not consider it inevitable.

Intensive research by the National Bureau of Economic Research (NBER) over many years has provided a list of those significant series that usually lead, those that usually move with, and those that usually lag behind cyclical movements in aggregate economic ac-

tivity. The series have been grouped and classified by the NBER as "leading", "roughly coincident", or "lagging" indicators. These indicators are defined as follows:

- ▷ *NBER Leading Indicators*.—Series that usually reach peaks or troughs before those in aggregate economic activity as measured by the roughly coincident series (see below). One group of these series pertains to activities in the labor market, another to orders and contracts, and so on.
- ▷ *NBER Roughly Coincident Indicators*.—Series that are direct measures of aggregate economic activity or move roughly together with it; for example, nonagricultural employment, industrial production, and retail sales.
- ▷ *NBER Lagging Indicators*.—Series, such as new plant and equipment expenditures and manufacturers' inventories, that usually reach turning points after they are reached in aggregate economic activity.

Other U.S. series with business cycle significance are included in this report. 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.

The list of series covered and sources of the basic data are shown on the back cover of this report. Series numbers are for identification only and do not reflect series relationships or order.

METHOD OF PRESENTATION

Data are shown in this report in three general categories, as follows:

- ▷ *Basic Data* (chart 1 and tables 1 and 2).—Data are shown for business cycle indicators, additional

U.S. series with business cycle significance, and industrial production indexes for selected countries. 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* (chart 2 and tables 3 to 5).— These are measures that aid in forming a judgment of the imminence of a turning point in the business cycle, determining the extent of current changes in different parts of the economy, and pointing to developments in particular industries and places.
- ▷ *Cyclical Patterns* (chart 3 and tables 6 and 7).— Current cyclical levels are compared with levels 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.

DESIGNATION OF BUSINESS CYCLE TURNING POINTS

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

Monthly business cycle peaks and troughs have been dated by the NBER for the period 1854-1961. Over this span, expansion has prevailed 61 percent of the time and contraction, 39 percent. If war periods are disregarded, expansion has prevailed 56 percent of the time and contraction, 44 percent.

SEASONAL AND RELATED STATISTICAL ADJUSTMENTS

Adjustments for normal seasonal fluctuations are often necessary to bring out the underlying cyclical trends of a series. Such adjustments allow for periodic intra-year variations resulting chiefly from normal differences in weather conditions during the year and from various institutional arrangements. Some series contain considerable variation attributable to the number of working or trading days in each month. An additional adjustment is necessary in such cases to reduce this variation. Variations due to holidays are usually accounted for by the seasonal adjustment process; how-

ever, there are some cases in which a separate holiday adjustment is necessary for holidays with variable dates. Such a case is retail sales of apparel which is affected strongly by the date of Easter and, to a lesser degree, by the dates of Labor Day and Thanksgiving.

In general, the seasonal adjustment process is designed to adjust for *average* weather conditions but not for the dispersion about that average. Thus, some seasonally adjusted series, such as housing starts, will tend to be low in months of unusually bad weather and high during unusually good weather. At the Bureau of the Census, studies have been started on some series to determine the effects of abnormal weather. Although it eventually may be possible, Census methods do not at present make any adjustments for such variations.

Most of the series contained in this report are presented in seasonally adjusted form. Unadjusted data are used only for those series which appear to have no pattern of seasonal variation. (Unadjusted series are identified in table 2.) In most cases, the seasonally adjusted data used for a series are the official figures released by the source agency; therefore, several different methods of seasonal adjustment are involved. In addition, 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. For these series, seasonal adjustments have been developed by either the NBER or the Census Bureau. The adjustment factors for these series, derived by Census Method II, are shown in appendix D. Factors for series which are the sums of seasonally adjusted components or which are based on unpublished source data are not shown.

MCD MOVING AVERAGES

MCD (months for cyclical dominance) is an estimate of the appropriate span over which to observe the cyclical movements in a monthly series. This span is usually longer than a single month because month-to-month changes are often dominated by erratic movements, but shorter than the frequently used 12-month span (change from the same month a year ago), and is different for different series (see appendix C for MCD values and method of computation).

MCD is, on average, the first span of months for which the average change for the cyclical factor is greater than that of the irregular factor and remains so. It is small for smooth series and large for irregular series. The month-to-month differences between moving averages of the period equal to MCD are commensurate with the differences between seasonally

adjusted values separated by the same MCD span; thus, the month-to-month differences in a 3-month moving average are commensurate with differences in seasonally adjusted values over 3-month spans. MCD moving averages all have about the same degree of smoothness. Consequently, MCD moving averages of highly irregular series, such as business failures and Federal cash payments, will show their cyclical movements about as clearly as the seasonally adjusted data for such smooth series as industrial production.

MCD moving averages are shown in chart 1 for all series with an MCD of "5" or more. To provide an indication of the variation about these moving averages, seasonally adjusted data are also plotted beginning with 1958. Although not so smooth as more powerful moving averages (such as the weighted 13-term Henderson curve), the MCD curve is more current and has a smaller rounding bias around business cycle peaks and troughs. On balance, the MCD curve seems to offer a reasonable compromise in terms of currency, smoothness, and fidelity to the patterns of business cycle fluctuations.

Because of advance reporting and preliminary seasonal factors, the MCD's for current data are usually larger than those computed from historical series and shown in appendix C. MCD is usually computed for a fairly long period, one covering both expansions and contractions. Since the pace of change varies from phase to phase of the business cycle, such a measure will not provide an accurate estimate of the span over which to estimate cyclically significant changes at all times. Thus, MCD computed for the period 1953-63 is likely to be too high during the early stages of recovery when expansion has usually been rapid and too low during the late stages of expansion when the rate of advance has usually been small. This limitation should be borne in mind when making use of this measure.¹

ANALYTICAL MEASURES OF CURRENT CHANGE

Three kinds of analytical measures are presented—timing distributions, diffusion indexes, and directions of change. These measures aid in forming a judgment of the 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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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. This timing distribution shows 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 presented 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 leading and roughly coincident business cycle indicators are scanned each month. During a business cycle expansion, the date of the high value for each series is recorded. (For inverted series—that is, series with negative conformity to the business cycle—dates of low values are taken.) 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 may be disregarded, although it is, of course, difficult to identify an erratic value, particularly for the current month.

The letter "H" is used in table 2 to identify and highlight the current high values during the expansion. The highs designated during the current cyclical phase will not necessarily be the specific cycle peaks. (See appendix B.) As new high levels are reached during the expansion, the current highs will be moved ahead. Comparisons of the current timing distributions with those for periods around earlier business cycle 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 simply reflect a short reversal in the upward movement.

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which have risen over given spans 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 and widespread declines with sharp reductions in aggregate activity.

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Recent research has shown that the longer-span diffusion indexes are not only smoother, but have systematically larger amplitudes than the 1-month indexes. The 1-month indexes generally have large irregular fluctuations, but the movements may be significant when important changes are taking place, particularly around cyclical turning points. Since the longer-span diffusion indexes are centered, there is an apparent loss in currency equal to one-half the span; for example, 3 months in the case of a 6-month diffusion index. However, the most recent figure for a 6-month or longer-span index does provide the latest available information on changes *over that span*. If a significant reversal has taken place *within that span*, the 1-month indexes are likely to reveal it. Presentation of both 1-month and longer-span diffusion indexes provides an opportunity for the user to take advantage of the best features of each in interpreting current changes.

Series numbers preceded by the letter "D" designate diffusion indexes. When one of these numbers corresponds to the number of a basic indicator series, 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 6. Diffusion indexes not computed from basic series components are assigned new numbers.

Diffusion indexes that are based on business expectations 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.

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Many of the component series used to make up the diffusion indexes are shown in table 5. Where possible, recent basic data for the components are shown in part A. In part B, directions of change in these components are indicated for consecutive months and, depending upon the irregularity of the diffusion index, for either 6- or 9-month spans. The directions of change are indicated by "+" for rising, "o" for unchanged, and "-" for falling. (In counting the number of components rising, a "o" is counted as one-half.)

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Expansions are also compared by computing changes *from reference trough levels and reference trough dates* (table 7). For the current expansion, this type of comparison measures the extent of the rise from the rough level (February 1961) to the level at the current month. For each earlier expansion, data for a like period (same number of months from the trough of the expansion) are compared with the level at the rough. The same situation exists here as for the comparisons shown in table 6: For earlier expansions that were shorter than the current one, the comparisons show the status at a point after a new contraction had set in.

Contractions can be 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 *changes from reference peak levels and reference peak dates*. These comparisons will be made during a contraction period.

In addition to comparing cyclical fluctuations on the basis of reference dates, which are the same for all series, similar comparisons may be made using the specific peak and trough dates identified for each series. Appendix B lists specific dates for a selected group of series.) Such comparisons would be based on changes *from specific peak levels and specific trough dates* and on changes *from specific trough levels and specific trough dates*. Although these specific cycle comparisons are not currently included in this report, they have been shown in previous issues.

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CHARTS

Two types of charts are used to highlight the cyclical patterns of the business cycle series: Historical time series and cyclical comparisons.

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These charts show cyclical fluctuations against the background of expansions and contractions in general business activity from 1948 to the current month. Shaded areas on the charts indicate periods of business cycle contractions between business cycle peak dates (beginnings of shaded areas) and business cycle trough dates (ends of shaded areas). The shading for a new contraction will be entered only after a trough has been designated.

Several different ratio and arithmetic scales are used to highlight the cyclical movements of the various series. The scale selected for each series is identified in the margin of the chart. Rates of change of various series can be compared with each other only where scales are identical. See the diagram, page 6, for additional help in using these charts.

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Instead of following the usual date sequence, as in charts 1 and 2, the data in this chart are aligned according to the strategic points of the business cycle. Each of the included series is separated into four segments which encompass the three complete business cycles since 1948 and the current expansion. These segments are aligned so that the trough dates all fall at the same point on the horizontal scale and so that the levels of the preceding peaks all fall at the same point on the vertical scale.

A similar chart, based on specific cycle dates, was previously included in this report but has been discontinued for the present.

HOW TO READ CHARTS 1 AND 2

Peak (P) of cycle indicates end of expansion and beginning of Recession (shaded areas) as designated by NBER.

CHART 1 — Business Cycle Series

Trough (T) of cycle indicates end of recession and beginning of Expansion (white areas) as designated by NBER.

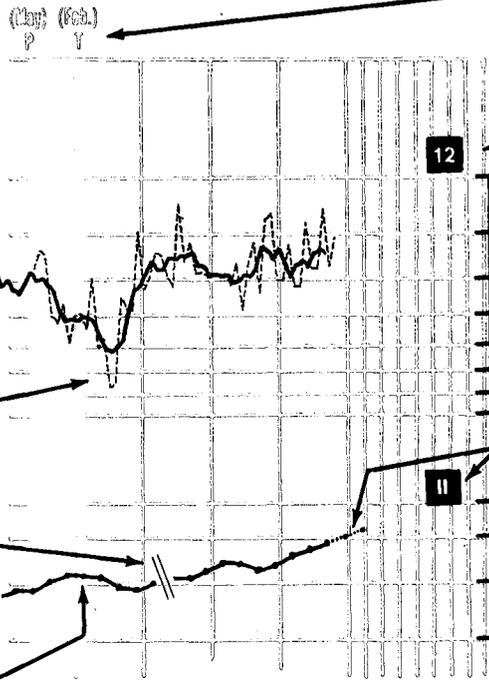
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Various scales are used to highlight the patterns of the individual series. "Scale A" is an arithmetic scale, "scale L'1" is a logarithmic scale with 1 cycle in a given distance, "scale L'2" is a logarithmic scale with 2 cycles in that distance, etc. The scales should be carefully noted because they show whether or not the plotted lines for various series are directly comparable.

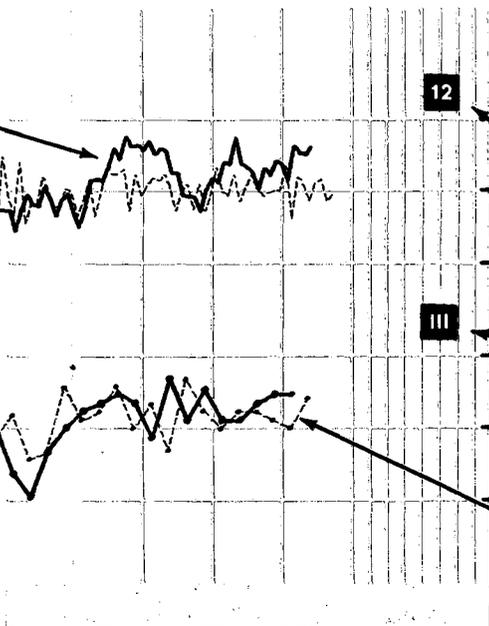
CHART 2 — Diffusion Indexes

Solid line indicates monthly data over 6- or 9-month spans.

Broken line indicates monthly data over 1-month spans.

Solid line with plotting points indicates quarterly data over various spans.

* Many of the more irregular series are shown in terms of their MCD moving averages as well as their actual monthly data. In such cases, the 4-, 5-, or 6-term moving averages are plotted 1½, 2, or 2½ months, respectively, behind the actual data. See page 2 for a description of MCD moving averages.



Scale shows percent of components rising.

Arabic number indicates latest month for which data are used in computing the indexes. ("12" = December)

Roman number indicates latest quarter for which data are used in computing the indexes. ("III" = third quarter)

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DESCRIPTIONS AND PROCEDURES

INTRODUCTION

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The causal relations among these various economic processes are primarily responsible for the cumulative nature of cyclical forces, and explain why expansion eventually turns into recession and recession into expansion. Cyclical fluctuations in production and employment are preceded by fluctuations in measures which relate to future rather than to current production—measures such as new orders for durable goods, the formation of new business enterprises, and accessions to payrolls. They are followed by fluctuations in various types of economic costs, such as labor costs, interest rates, fulfillment of long-term commitments, and holdings of inventories and of debts.

Although this pattern has been characteristic of American economic history, today many economists do not consider it inevitable.

Intensive research by the National Bureau of Economic Research (NBER) over many years has provided a list of those significant series that usually lead, those that usually move with, and those that usually lag behind cyclical movements in aggregate economic ac-

tivity. The series have been grouped and classified by the NBER as "leading", "roughly coincident", or "lagging" indicators. These indicators are defined as follows:

- ▷ *NBER Leading Indicators*.—Series that usually reach peaks or troughs before those in aggregate economic activity as measured by the roughly coincident series (see below). One group of these series pertains to activities in the labor market, another to orders and contracts, and so on.
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Other U.S. series with business cycle significance are included in this report. 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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DESIGNATION OF BUSINESS CYCLE TURNING POINTS

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Monthly business cycle peaks and troughs have been dated by the NBER for the period 1854-1961. Over this span, expansion has prevailed 61 percent of the time and contraction, 39 percent. If war periods are disregarded, expansion has prevailed 56 percent of the time and contraction, 44 percent.

SEASONAL AND RELATED STATISTICAL ADJUSTMENTS

Adjustments for normal seasonal fluctuations are often necessary to bring out the underlying cyclical trends of a series. Such adjustments allow for periodic intra-year variations resulting chiefly from normal differences in weather conditions during the year and from various institutional arrangements. Some series contain considerable variation attributable to the number of working or trading days in each month. An additional adjustment is necessary in such cases to reduce this variation. Variations due to holidays are usually accounted for by the seasonal adjustment process; how-

ever, there are some cases in which a separate holiday adjustment is necessary for holidays with variable dates. Such a case is retail sales of apparel which is affected strongly by the date of Easter and, to a lesser degree, by the dates of Labor Day and Thanksgiving.

In general, the seasonal adjustment process is designed to adjust for *average* weather conditions but not for the dispersion about that average. Thus, some seasonally adjusted series, such as housing starts, will tend to be low in months of unusually bad weather and high during unusually good weather. At the Bureau of the Census, studies have been started on some series to determine the effects of abnormal weather. Although it eventually may be possible, Census methods do not at present make any adjustments for such variations.

Most of the series contained in this report are presented in seasonally adjusted form. Unadjusted data are used only for those series which appear to have no pattern of seasonal variation. (Unadjusted series are identified in table 2.) In most cases, the seasonally adjusted data used for a series are the official figures released by the source agency; therefore, several different methods of seasonal adjustment are involved. In addition, 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. For these series, seasonal adjustments have been developed by either the NBER or the Census Bureau. The adjustment factors for these series, derived by Census Method II, are shown in appendix D. Factors for series which are the sums of seasonally adjusted components or which are based on unpublished source data are not shown.

MCD MOVING AVERAGES

MCD (months for cyclical dominance) is an estimate of the appropriate span over which to observe the cyclical movements in a monthly series. This span is usually longer than a single month because month-to-month changes are often dominated by erratic movements, but shorter than the frequently used 12-month span (change from the same month a year ago), and is different for different series (see appendix C for MCD values and method of computation).

MCD is, on average, the first span of months for which the average change for the cyclical factor is greater than that of the irregular factor and remains so. It is small for smooth series and large for irregular series. The month-to-month differences between moving averages of the period equal to MCD are commensurate with the differences between seasonally

adjusted values separated by the same MCD span; thus, the month-to-month differences in a 3-month moving average are commensurate with differences in seasonally adjusted values over 3-month spans. MCD moving averages all have about the same degree of smoothness. Consequently, MCD moving averages of highly irregular series, such as business failures and Federal cash payments, will show their cyclical movements about as clearly as the seasonally adjusted data for such smooth series as industrial production.

MCD moving averages are shown in chart 1 for all series with an MCD of "5" or more. To provide an indication of the variation about these moving averages, seasonally adjusted data are also plotted beginning with 1958. Although not so smooth as more powerful moving averages (such as the weighted 13-term Henderson curve), the MCD curve is more current and has a smaller rounding bias around business cycle peaks and troughs. On balance, the MCD curve seems to offer a reasonable compromise in terms of currency, smoothness, and fidelity to the patterns of business cycle fluctuations.

Because of advance reporting and preliminary seasonal factors, the MCD's for current data are usually larger than those computed from historical series and shown in appendix C. MCD is usually computed for a fairly long period, one covering both expansions and contractions. Since the pace of change varies from phase to phase of the business cycle, such a measure will not provide an accurate estimate of the span over which to estimate cyclically significant changes at all times. Thus, MCD computed for the period 1953-63 is likely to be too high during the early stages of recovery when expansion has usually been rapid and too low during the late stages of expansion when the rate of advance has usually been small. This limitation should be borne in mind when making use of this measure.¹

ANALYTICAL MEASURES OF CURRENT CHANGE

Three kinds of analytical measures are presented—timing distributions, diffusion indexes, and directions of change. These measures aid in forming a judgment of the 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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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. This timing distribution shows 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 presented 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 leading and roughly coincident business cycle indicators are scanned each month. During a business cycle expansion, the date of the high value for each series is recorded. (For inverted series—that is, series with negative conformity to the business cycle—dates of low values are taken.) 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 may be disregarded, although it is, of course, difficult to identify an erratic value, particularly for the current month.

The letter "H" is used in table 2 to identify and highlight the current high values during the expansion. The highs designated during the current cyclical phase will not necessarily be the specific cycle peaks. (See appendix B.) As new high levels are reached during the expansion, the current highs will be moved ahead. Comparisons of the current timing distributions with those for periods around earlier business cycle 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 simply reflect a short reversal in the upward movement.

Diffusion Indexes

Diffusion indexes are simple summary measures of groups of economic series. They express, for a given aggregate series, the percent of the series components

which have risen over given spans 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 and widespread declines with sharp reductions in aggregate activity.

The diffusion indexes in this report are grouped according to the timing classification of the NBER. For monthly series, comparisons are made over 1-month spans (January-February, February-March, etc.) and generally for either 6- or 9-month spans, depending upon the irregularity of the series. The indexes based on 1-month spans are more "current" but they are also more irregular than the 6- or 9-month indexes. (See chart 2.) Quarterly series are compared over 1-quarter spans, 3-quarter spans, and 4-quarter spans.

Recent research has shown that the longer-span diffusion indexes are not only smoother, but have systematically larger amplitudes than the 1-month indexes. The 1-month indexes generally have large irregular fluctuations, but the movements may be significant when important changes are taking place, particularly around cyclical turning points. Since the longer-span diffusion indexes are centered, there is an apparent loss in currency equal to one-half the span; for example, 3 months in the case of a 6-month diffusion index. However, the most recent figure for a 6-month or longer-span index does provide the latest available information on changes *over that span*. If a significant reversal has taken place *within that span*, the 1-month indexes are likely to reveal it. Presentation of both 1-month and longer-span diffusion indexes provides an opportunity for the user to take advantage of the best features of each in interpreting current changes.

Series numbers preceded by the letter "D" designate diffusion indexes. When one of these numbers corresponds to the number of a basic indicator series, 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 6. Diffusion indexes not computed from basic series components are assigned new numbers.

Diffusion indexes that are based on business expectations 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-Index Components

Many of the component series used to make up the diffusion indexes are shown in table 5. Where possible, recent basic data for the components are shown in part A. In part B, directions of change in these components are indicated for consecutive months and, depending upon the irregularity of the diffusion index, for either 6- or 9-month spans. The directions of change are indicated by "+" for rising, "o" for unchanged, and "-" for falling. (In counting the number of components rising, a "o" is counted as one-half.)

This table provides a convenient view of changing business conditions and is helpful in making an economic interpretation of the movements in the more highly aggregated statistical measures. That is, it shows which economic activities went up, which went down, and how long such movements have persisted. The table also helps 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 various series 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 whether the current cyclical phase is an expansion or contraction.

Expansions are compared in one way by measuring changes from the immediately preceding peak levels. In table 6 of this report, data for the latest month in the current expansion (shown by number of months from the February 1961 trough) are compared with the May 1960 reference peak. For each earlier expansion, data for a like period (same number of months from the trough of the expansion) are compared with the preceding reference peak. This type of comparison is designated as changes computed *from reference peak levels and reference trough dates*. This type of comparison shows whether, and by how much, the current level of activity exceeds or falls short of the level at the preceding business cycle peak, and how the current situation compares, in this respect, with earlier expansions. For those earlier periods of expansion that were shorter than the current one, the comparisons reflect status at reference peak levels.

Expansions are also compared by computing changes *from reference trough levels and reference trough dates* (table 7). For the current expansion, this type of comparison measures the extent of the rise from the trough level (February 1961) to the level at the current month. For each earlier expansion, data for a like period (same number of months from the trough of the expansion) are compared with the level at the trough. The same situation exists here as for the comparisons shown in table 6: For earlier expansions that were shorter than the current one, the comparisons show the status at reference peak levels.

Contractions can be 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 changes *from reference peak levels and reference peak dates*. These comparisons will be made during a contraction period.

In addition to comparing cyclical fluctuations on the basis of reference dates, which are the same for all series, similar comparisons may be made using the specific peak and trough dates identified for each series. (Appendix B lists specific dates for a selected group of series.) Such comparisons would be based on changes *from specific peak levels and specific trough dates* and on changes *from specific trough levels and specific trough dates*. Although these specific cycle comparisons are not currently included in this report, they have been shown in previous issues.

Nearly all series have undergone changes in definition, coverage, or estimation procedure since 1919; therefore, the historical comparisons are to be considered only approximate. Furthermore, it is sometimes necessary to use data for a closely related series for cycles prior to the period covered by the series used currently. The principal substitutions of this type are as follows:

7. New private nonfarm dwelling units started (prior to 1948: Residential building contracts, floor space, by F. W. Dodge Corp.)
41. Number of employees in nonagricultural establishments (prior to 1929: Factory employment)
52. Personal income (prior to 1929: Quarterly data as published by Barger and Klein)
54. Sales of retail stores (prior to 1929: Department store sales)
62. Index of labor cost per unit of output, total manufacturing (prior to 1948: Production worker wage cost per unit).

CHARTS

Two types of charts are used to highlight the cyclical patterns of the business cycle series: Historical time series and cyclical comparisons.

Historical Time Series (charts 1 and 2)

These charts show cyclical fluctuations against the background of expansions and contractions in general business activity from 1948 to the current month. Shaded areas on the charts indicate periods of business cycle contractions between business cycle peak dates (beginnings of shaded areas) and business cycle trough dates (ends of shaded areas). The shading for a new contraction will be entered only after a trough has been designated.

Several different ratio and arithmetic scales are used to highlight the cyclical movements of the various series. The scale selected for each series is identified in the margin of the chart. Rates of change of various series can be compared with each other only where scales are identical. See the diagram, page 6, for additional help in using these charts.

Cyclical Comparisons (chart 3)

This chart compares the movements of selected series during the current business cycle with their movements through the corresponding phases of previous business cycles. Actually, it is an extension of the concept behind table 6. While table 6 makes a comparison at one point in time, chart 3 shows these comparisons over the course of the whole business cycle. These comparisons facilitate judgments on the vigor of the current expansion relative to behavior during the expansions of earlier cycles.

Instead of following the usual date sequence, as in charts 1 and 2, the data in this chart are alined according to the strategic points of the business cycle. Each of the included series is separated into four segments which encompass the three complete business cycles since 1948 and the current expansion. These segments are alined so that the trough dates all fall at the same point on the horizontal scale and so that the levels of the preceding peaks all fall at the same point on the vertical scale.

A similar chart, based on specific cycle dates, was previously included in this report but has been discontinued for the present.

HOW TO READ CHARTS 1 AND 2

Peak (P) of cycle indicates end of expansion and beginning of Recession (shaded areas) as designated by NBER.

CHART 1 — Business Cycle Series

Trough (T) of cycle indicates end of recession and beginning of Expansion (white areas) as designated by NBER.

See back cover for complete titles and sources of series.

Arabic number indicates latest month for which data are plotted. ("12" = December)

Solid line indicates monthly data. (Data may be actual monthly figures or MCD moving averages.*)

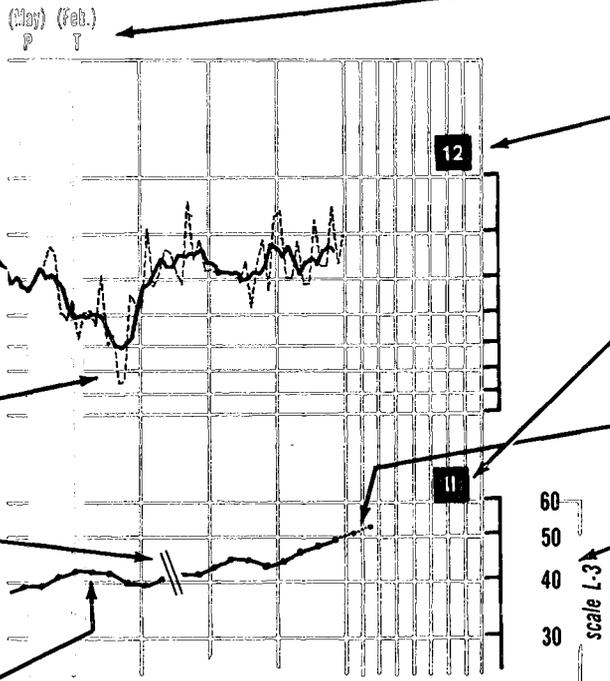
Roman number indicates latest quarter for which data are plotted. ("II" = second quarter)

Broken line indicates actual monthly data for series where an MCD moving average* is plotted.

Dotted line indicates anticipated data.

Parallel lines indicate a break in continuity (data not available, changes in series definitions, extreme values, etc.)

Solid line with plotting points indicates quarterly data.



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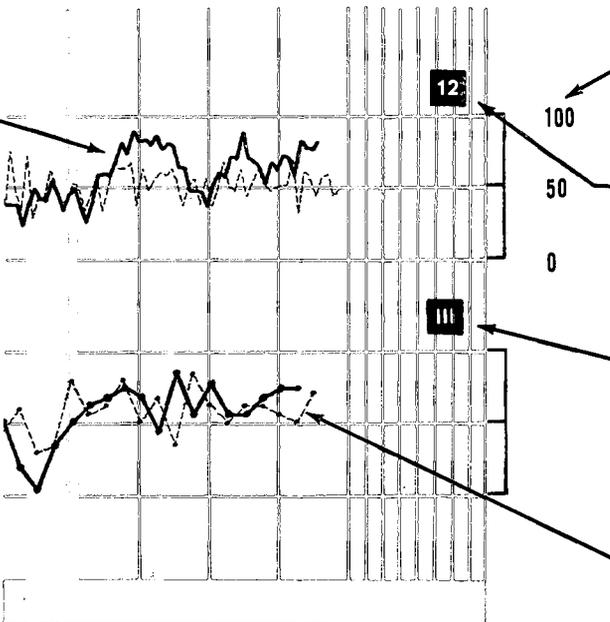
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To compile timing distributions for the current cyclical phase, the data for the leading and roughly coincident business cycle indicators are scanned each month. During a business cycle expansion, the date of the high value for each series is recorded. (For inverted series—that is, series with negative conformity to the business cycle—dates of low values are taken.) 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 may be disregarded, although it is, of course, difficult to identify an erratic value, particularly for the current month.

The letter "H" is used in table 2 to identify and highlight the current high values during the expansion. The highs designated during the current cyclical phase will not necessarily be the specific cycle peaks. (See appendix B.) As new high levels are reached during the expansion, the current highs will be moved ahead. Comparisons of the current timing distributions with those for periods around earlier business cycle 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 simply reflect a short reversal in the upward movement.

Diffusion Indexes

Diffusion indexes are simple summary measures of groups of economic series. They express, for a given aggregate series, the percent of the series components

which have risen over given spans 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 and widespread declines with sharp reductions in aggregate activity.

The diffusion indexes in this report are grouped according to the timing classification of the NBER. For monthly series, comparisons are made over 1-month spans (January-February, February-March, etc.) and generally for either 6- or 9-month spans, depending upon the irregularity of the series. The indexes based on 1-month spans are more "current" but they are also more irregular than the 6- or 9-month indexes. (See chart 2.) Quarterly series are compared over 1-quarter spans, 3-quarter spans, and 4-quarter spans.

Recent research has shown that the longer-span diffusion indexes are not only smoother, but have systematically larger amplitudes than the 1-month indexes. The 1-month indexes generally have large irregular fluctuations, but the movements may be significant when important changes are taking place, particularly around cyclical turning points. Since the longer-span diffusion indexes are centered, there is an apparent loss in currency equal to one-half the span; for example, 3 months in the case of a 6-month diffusion index. However, the most recent figure for a 6-month or longer-span index does provide the latest available information on changes *over that span*. If a significant reversal has taken place *within that span*, the 1-month indexes are likely to reveal it. Presentation of both 1-month and longer-span diffusion indexes provides an opportunity for the user to take advantage of the best features of each in interpreting current changes.

Series numbers preceded by the letter "D" designate diffusion indexes. When one of these numbers corresponds to the number of a basic indicator series, 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 6. Diffusion indexes not computed from basic series components are assigned new numbers.

Diffusion indexes that are based on business expectations 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-Index Components

Many of the component series used to make up the diffusion indexes are shown in table 5. Where possible, recent basic data for the components are shown in part A. In part B, directions of change in these components are indicated for consecutive months and, depending upon the irregularity of the diffusion index, for either 6- or 9-month spans. The directions of change are indicated by "+" for rising, "o" for unchanged, and "-" for falling. (In counting the number of components rising, a "o" is counted as one-half.)

This table provides a convenient view of changing business conditions and is helpful in making an economic interpretation of the movements in the more highly aggregated statistical measures. That is, it shows which economic activities went up, which went down, and how long such movements have persisted. The table also helps to show how a recession or recovery spreads from one sector of the economy to another.

COMPARISONS
EXPANSION PERIODS

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 various series 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 whether the current cyclical phase is an expansion or contraction.

Expansions are compared in one way by measuring changes from the immediately preceding peak levels. In table 6 of this report, data for the latest month in the current expansion (shown by number of months from the February 1961 trough) are compared with the May 1960 reference peak. For each earlier expansion, data for a like period (same number of months from the trough of the expansion) are compared with the preceding reference peak. This type of comparison is designated as changes computed *from reference peak levels and reference trough dates*. This type of comparison shows whether, and by how much, the current level of activity exceeds or falls short of the level at the preceding business cycle peak, and how the current situation compares, in this respect, with earlier expansions. For those earlier periods of expansion that were shorter than the current one, the comparisons reflect the status at a point after a new contraction had set in.

Expansions are also compared by computing changes *from reference trough levels and reference trough dates* (table 7). For the current expansion, this type of comparison measures the extent of the rise from the trough level (February 1961) to the level at the current month. For each earlier expansion, data for a like period (same number of months from the trough of the expansion) are compared with the level at the trough. The same situation exists here as for the comparisons shown in table 6: For earlier expansions that were shorter than the current one, the comparisons show the status at reference peak levels.

Contractions can be 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 changes *from reference peak levels and reference peak dates*. These comparisons will be made during a contraction period.

In addition to comparing cyclical fluctuations on the basis of reference dates, which are the same for all series, similar comparisons may be made using the specific peak and trough dates identified for each series. (Appendix B lists specific dates for a selected group of series.) Such comparisons would be based on changes *from specific peak levels and specific trough dates* and on changes *from specific trough levels and specific trough dates*. Although these specific cycle comparisons are not currently included in this report, they have been shown in previous issues.

Nearly all series have undergone changes in definition, coverage, or estimation procedure since 1919; therefore, the historical comparisons are to be considered only approximate. Furthermore, it is sometimes necessary to use data for a closely related series for cycles prior to the period covered by the series used currently. The principal substitutions of this type are as follows:

7. New private nonfarm dwelling units started (prior to 1948: Residential building contracts, floor space, by F. W. Dodge Corp.)
41. Number of employees in nonagricultural establishments (prior to 1929: Factory employment)
52. Personal income (prior to 1929: Quarterly data as published by Barger and Klein)
54. Sales of retail stores (prior to 1929: Department store sales)
62. Index of labor cost per unit of output, total manufacturing (prior to 1948: Production worker wage cost per unit).

CHARTS

Two types of charts are used to highlight the cyclical patterns of the business cycle series: Historical time series and cyclical comparisons.

Historical Time Series (charts 1 and 2)

These charts show cyclical fluctuations against the background of expansions and contractions in general business activity from 1948 to the current month. Shaded areas on the charts indicate periods of business cycle contractions between business cycle peak dates (beginnings of shaded areas) and business cycle trough dates (ends of shaded areas). The shading for a new contraction will be entered only after a trough has been designated.

Several different ratio and arithmetic scales are used to highlight the cyclical movements of the various series. The scale selected for each series is identified in the margin of the chart. Rates of change of various series can be compared with each other only where scales are identical. See the diagram, page 6, for additional help in using these charts.

Cyclical Comparisons (chart 3)

This chart compares the movements of selected series during the current business cycle with their movements through the corresponding phases of previous business cycles. Actually, it is an extension of the concept behind table 6. While table 6 makes a comparison at one point in time, chart 3 shows these comparisons over the course of the whole business cycle. These comparisons facilitate judgments on the vigor of the current expansion relative to behavior during the expansions of earlier cycles.

Instead of following the usual date sequence, as in charts 1 and 2, the data in this chart are alined according to the strategic points of the business cycle. Each of the included series is separated into four segments which encompass the three complete business cycles since 1948 and the current expansion. These segments are alined so that the trough dates all fall at the same point on the horizontal scale and so that the levels of the preceding peaks all fall at the same point on the vertical scale.

A similar chart, based on specific cycle dates, was previously included in this report but has been discontinued for the present.

HOW TO READ CHARTS 1 AND 2

Peak (P) of cycle indicates end of expansion and beginning of Recession (shaded areas) as designated by NBER.

CHART 1 — Business Cycle Series

Trough (T) of cycle indicates end of recession and beginning of Expansion (white areas) as designated by NBER.

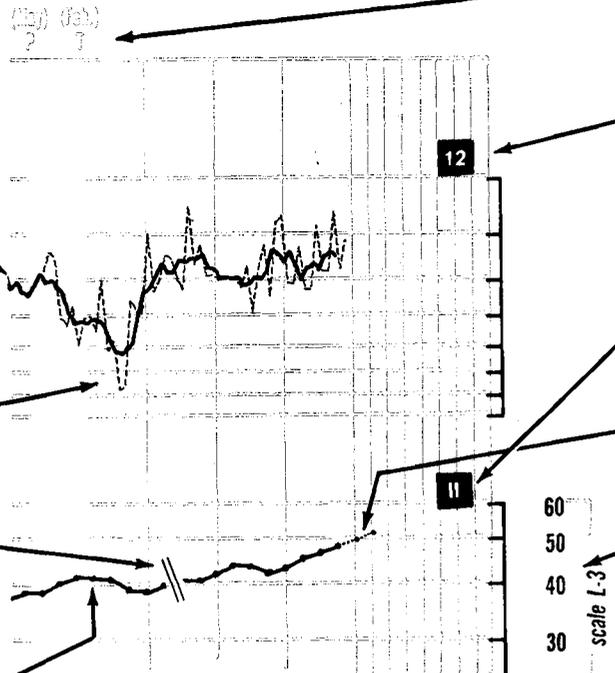
See back cover for complete titles and sources of series.

Solid line indicates monthly data. (Data may be actual monthly figures or MCD moving averages.*)

Broken line indicates actual monthly data for series where an MCD moving average* is plotted.

Parallel lines indicate a break in continuity (data not available, changes in series definitions, extreme values, etc.)

Solid line with plotting points indicates quarterly data.



Arabic number indicates latest month for which data are plotted. ("12" = December)

Roman number indicates latest quarter for which data are plotted. ("II" = second quarter)

Dotted line indicates anticipated data.

Various scales are used to highlight the patterns of the individual series. "Scale A" is an arithmetic scale, "scale L'1" is a logarithmic scale with 1 cycle in a given distance, "scale L'2" is a logarithmic scale with 2 cycles in that distance, etc. The scales should be carefully noted because they show whether or not the plotted lines for various series are directly comparable.

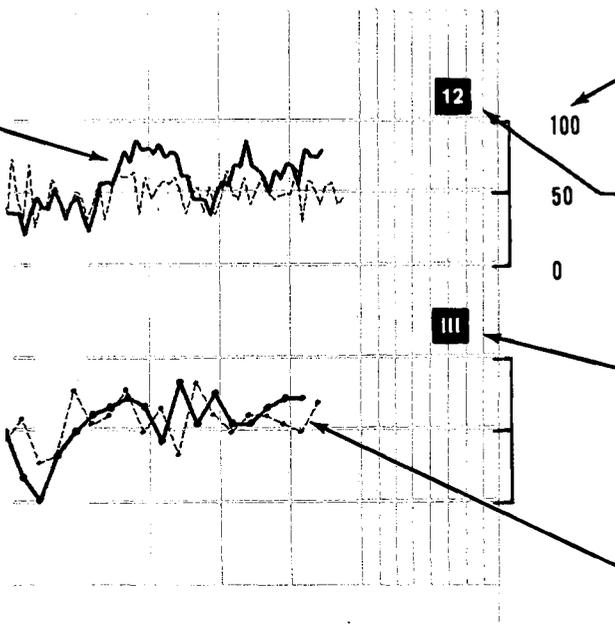
CHART 2 — Diffusion Indexes

Solid line indicates monthly data over 6- or 9-month spans.

Broken line indicates monthly data over 1-month spans.

Solid line with plotting points indicates quarterly data over various spans.

* Many of the more irregular series are shown in terms of their MCD moving averages as well as their actual monthly data. In such cases, the 4-, 5-, or 6-term moving averages are plotted 1½, 2, or 2½ months, respectively, behind the actual data. See page 2 for a description of MCD moving averages.



Scale shows percent of components rising.

Arabic number indicates latest month for which data are used in computing the indexes. ("12" = December)

Roman number indicates latest quarter for which data are used in computing the indexes. ("III" = third quarter)

Broken line with plotting points indicates quarterly data over various intervals. This line is also used to indicate anticipated quarterly data.

DESCRIPTIONS AND PROCEDURES

INTRODUCTION

Students of economic conditions describe the business cycle as consisting of alternating periods of expansion and contraction in production, employment, income, money flows, prices, and other economic processes. The fluctuations take place in a concerted manner, but not simultaneously. Once an expansion gets underway, it spreads from firm to firm, from industry to industry, from area to area, and from process to process, cumulating until a cyclical peak in aggregate activity is reached. Even while expansion is widespread during the upward phase of the business cycle, some activities continue to move in the opposite direction. Declines begin to spread as the expansion nears its peak and continue to spread even faster after the peak has been passed. But some activities continue to expand during the general contraction. Before long these expansions become stronger and more widespread. When they begin to dominate the situation, the upturn in aggregate activity has arrived and a new expansion is underway. This sequence is recurrent, but not periodic.

The causal relations among these various economic processes are primarily responsible for the cumulative nature of cyclical forces, and explain why expansion eventually turns into recession and recession into expansion. Cyclical fluctuations in production and employment are preceded by fluctuations in measures which relate to future rather than to current production—measures such as new orders for durable goods, the formation of new business enterprises, and accessions to payrolls. They are followed by fluctuations in various types of economic costs, such as labor costs, interest rates, fulfillment of long-term commitments, and holdings of inventories and of debts.

Although this pattern has been characteristic of American economic history, today many economists do not consider it inevitable.

Intensive research by the National Bureau of Economic Research (NBER) over many years has provided a list of those significant series that usually lead, those that usually move with, and those that usually lag behind cyclical movements in aggregate economic ac-

tivity. The series have been grouped and classified by the NBER as "leading", "roughly coincident", or "lagging" indicators. These indicators are defined as follows:

- ▷ *NBER Leading Indicators.*—Series that usually reach peaks or troughs before those in aggregate economic activity as measured by the roughly coincident series (see below). One group of these series pertains to activities in the labor market, another to orders and contracts, and so on.
- ▷ *NBER Roughly Coincident Indicators.*—Series that are direct measures of aggregate economic activity or move roughly together with it; for example, nonagricultural employment, industrial production, and retail sales.
- ▷ *NBER Lagging Indicators.*—Series, such as new plant and equipment expenditures and manufacturers' inventories, that usually reach turning points after they are reached in aggregate economic activity.

Other U.S. series with business cycle significance are included in this report. 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.

The list of series covered and sources of the basic data are shown on the back cover of this report. Series numbers are for identification only and do not reflect series relationships or order.

METHOD OF PRESENTATION

Data are shown in this report in three general categories, as follows:

- ▷ *Basic Data* (chart 1 and tables 1 and 2).—Data are shown for business cycle indicators, additional

U.S. series with business cycle significance, and industrial production indexes for selected countries. 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* (chart 2 and tables 3 to 5).— These are measures that aid in forming a judgment of the imminence of a turning point in the business cycle, determining the extent of current changes in different parts of the economy, and pointing to developments in particular industries and places.
- ▷ *Cyclical Patterns* (chart 3 and tables 6 and 7).— Current cyclical levels are compared with levels 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.

DESIGNATION OF BUSINESS CYCLE TURNING POINTS

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

Monthly business cycle peaks and troughs have been dated by the NBER for the period 1854-1961. Over this span, expansion has prevailed 61 percent of the time and contraction, 39 percent. If war periods are disregarded, expansion has prevailed 56 percent of the time and contraction, 44 percent.

SEASONAL AND RELATED STATISTICAL ADJUSTMENTS

Adjustments for normal seasonal fluctuations are often necessary to bring out the underlying cyclical trends of a series. Such adjustments allow for periodic intra-year variations resulting chiefly from normal differences in weather conditions during the year and from various institutional arrangements. Some series contain considerable variation attributable to the number of working or trading days in each month. An additional adjustment is necessary in such cases to reduce this variation. Variations due to holidays are usually accounted for by the seasonal adjustment process; how-

ever, there are some cases in which a separate holiday adjustment is necessary for holidays with variable dates. Such a case is retail sales of apparel which is affected strongly by the date of Easter and, to a lesser degree, by the dates of Labor Day and Thanksgiving.

In general, the seasonal adjustment process is designed to adjust for *average* weather conditions but not for the dispersion about that average. Thus, some seasonally adjusted series, such as housing starts, will tend to be low in months of unusually bad weather and high during unusually good weather. At the Bureau of the Census, studies have been started on some series to determine the effects of abnormal weather. Although it eventually may be possible, Census methods do not at present make any adjustments for such variations.

Most of the series contained in this report are presented in seasonally adjusted form. Unadjusted data are used only for those series which appear to have no pattern of seasonal variation. (Unadjusted series are identified in table 2.) In most cases, the seasonally adjusted data used for a series are the official figures released by the source agency; therefore, several different methods of seasonal adjustment are involved. In addition, 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. For these series, seasonal adjustments have been developed by either the NBER or the Census Bureau. The adjustment factors for these series, derived by Census Method II, are shown in appendix D. Factors for series which are the sums of seasonally adjusted components or which are based on unpublished source data are not shown.

MCD MOVING AVERAGES

MCD (months for cyclical dominance) is an estimate of the appropriate span over which to observe the cyclical movements in a monthly series. This span is usually longer than a single month because month-to-month changes are often dominated by erratic movements, but shorter than the frequently used 12-month span (change from the same month a year ago), and is different for different series (see appendix C for MCD values and method of computation).

MCD is, on average, the first span of months for which the average change for the cyclical factor is greater than that of the irregular factor and remains so. It is small for smooth series and large for irregular series. The month-to-month differences between moving averages of the period equal to MCD are commensurate with the differences between seasonally

adjusted values separated by the same MCD span; thus, the month-to-month differences in a 3-month moving average are commensurate with differences in seasonally adjusted values over 3-month spans. MCD moving averages all have about the same degree of smoothness. Consequently, MCD moving averages of highly irregular series, such as business failures and Federal cash payments, will show their cyclical movements about as clearly as the seasonally adjusted data for such smooth series as industrial production.

MCD moving averages are shown in chart 1 for all series with an MCD of "5" or more. To provide an indication of the variation about these moving averages, seasonally adjusted data are also plotted beginning with 1958. Although not so smooth as more powerful moving averages (such as the weighted 13-term Henderson curve), the MCD curve is more current and has a smaller rounding bias around business cycle peaks and troughs. On balance, the MCD curve seems to offer a reasonable compromise in terms of currency, smoothness, and fidelity to the patterns of business cycle fluctuations.

Because of advance reporting and preliminary seasonal factors, the MCD's for current data are usually larger than those computed from historical series and shown in appendix C. MCD is usually computed for a fairly long period, one covering both expansions and contractions. Since the pace of change varies from phase to phase of the business cycle, such a measure will not provide an accurate estimate of the span over which to estimate cyclically significant changes at all times. Thus, MCD computed for the period 1953-63 is likely to be too high during the early stages of recovery when expansion has usually been rapid and too low during the late stages of expansion when the rate of advance has usually been small. This limitation should be borne in mind when making use of this measure.¹

ANALYTICAL MEASURES OF CURRENT CHANGE

Three kinds of analytical measures are presented—timing distributions, diffusion indexes, and directions of change. These measures aid in forming a judgment of the 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.

¹ For a more complete description of MCD and its use in studying economic series, see *Business Cycle Indicators*, Geoffrey H. Moore, editor; National Bureau of Economic Research, Inc., vol. 1, ch. 18, "Statistics for Short-Term Economic Forecasting," by Julius Shiskin (Princeton University Press: 1961).

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. This timing distribution shows 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 presented 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 leading and roughly coincident business cycle indicators are scanned each month. During a business cycle expansion, the date of the high value for each series is recorded. (For inverted series—that is, series with negative conformity to the business cycle—dates of low values are taken.) 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 may be disregarded, although it is, of course, difficult to identify an erratic value, particularly for the current month.

The letter "H" is used in table 2 to identify and highlight the current high values during the expansion. The highs designated during the current cyclical phase will not necessarily be the specific cycle peaks. (See appendix B.) As new high levels are reached during the expansion, the current highs will be moved ahead. Comparisons of the current timing distributions with those for periods around earlier business cycle 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 simply reflect a short reversal in the upward movement.

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Diffusion indexes are simple summary measures of groups of economic series. They express, for a given aggregate series, the percent of the series components

which have risen over given spans 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 and widespread declines with sharp reductions in aggregate activity.

The diffusion indexes in this report are grouped according to the timing classification of the NBER. For monthly series, comparisons are made over 1-month spans (January-February, February-March, etc.) and generally for either 6- or 9-month spans, depending upon the irregularity of the series. The indexes based on 1-month spans are more "current" but they are also more irregular than the 6- or 9-month indexes. (See chart 2.) Quarterly series are compared over 1-quarter spans, 3-quarter spans, and 4-quarter spans.

Recent research has shown that the longer-span diffusion indexes are not only smoother, but have systematically larger amplitudes than the 1-month indexes. The 1-month indexes generally have large irregular fluctuations, but the movements may be significant when important changes are taking place, particularly around cyclical turning points. Since the longer-span diffusion indexes are centered, there is an apparent loss in currency equal to one-half the span; for example, 3 months in the case of a 6-month diffusion index. However, the most recent figure for a 6-month or longer-span index does provide the latest available information on changes *over that span*. If a significant reversal has taken place *within that span*, the 1-month indexes are likely to reveal it. Presentation of both 1-month and longer-span diffusion indexes provides an opportunity for the user to take advantage of the best features of each in interpreting current changes.

Series numbers preceded by the letter "D" designate diffusion indexes. When one of these numbers corresponds to the number of a basic indicator series, 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 6. Diffusion indexes not computed from basic series components are assigned new numbers.

Diffusion indexes that are based on business expectations 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-Index Components

Many of the component series used to make up the diffusion indexes are shown in table 5. Where possible, recent basic data for the components are shown in part A. In part B, directions of change in these components are indicated for consecutive months and, depending upon the irregularity of the diffusion index, for either 6- or 9-month spans. The directions of change are indicated by "+" for rising, "o" for unchanged, and "-" for falling. (In counting the number of components rising, a "o" is counted as one-half.)

This table provides a convenient view of changing business conditions and is helpful in making an economic interpretation of the movements in the more highly aggregated statistical measures. That is, it shows which economic activities went up, which went down, and how long such movements have persisted. The table also helps 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 various series 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 whether the current cyclical phase is an expansion or contraction.

Expansions are compared in one way by measuring changes from the immediately preceding peak levels. In table 6 of this report, data for the latest month in the current expansion (shown by number of months from the February 1961 trough) are compared with the May 1960 reference peak. For each earlier expansion, data for a like period (same number of months from the trough of the expansion) are compared with the preceding reference peak. This type of comparison is designated as changes computed *from reference peak levels and reference trough dates*. This type of comparison shows whether, and by how much, the current level of activity exceeds or falls short of the level at the preceding business cycle peak, and how the current situation compares, in this respect, with earlier expansions. For those earlier periods of expansion that were shorter than the current one, the comparisons reflect status at reference peak levels.

Expansions are also compared by computing changes from reference trough levels and reference trough dates (table 7). For the current expansion, this type of comparison measures the extent of the rise from the trough level (February 1961) to the level at the current month. For each earlier expansion, data for a like period (same number of months from the trough of the expansion) are compared with the level at the trough. The same situation exists here as for the comparisons shown in table 6: For earlier expansions that were shorter than the current one, the comparisons show the status at reference peak levels.

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In addition to comparing cyclical fluctuations on the basis of reference dates, which are the same for all series, similar comparisons may be made using the specific peak and trough dates identified for each series. (Appendix B lists specific dates for a selected group of series.) Such comparisons would be based on changes from specific peak levels and specific trough dates and on changes from specific trough levels and specific trough dates. Although these specific cycle comparisons are not currently included in this report, they have been shown in previous issues.

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CHARTS

Two types of charts are used to highlight the cyclical patterns of the business cycle series: Historical time series and cyclical comparisons.

Historical Time Series (charts 1 and 2)

These charts show cyclical fluctuations against the background of expansions and contractions in general business activity from 1948 to the current month. Shaded areas on the charts indicate periods of business cycle contractions between business cycle peak dates (beginnings of shaded areas) and business cycle trough dates (ends of shaded areas). The shading for a new contraction will be entered only after a trough has been designated.

Several different ratio and arithmetic scales are used to highlight the cyclical movements of the various series. The scale selected for each series is identified in the margin of the chart. Rates of change of various series can be compared with each other only where scales are identical. See the diagram, page 6, for additional help in using these charts.

Cyclical Comparisons (chart 3)

This chart compares the movements of selected series during the current business cycle with their movements through the corresponding phases of previous business cycles. Actually, it is an extension of the concept behind table 6. While table 6 makes a comparison at one point in time, chart 3 shows these comparisons over the course of the whole business cycle. These comparisons facilitate judgments on the vigor of the current expansion relative to behavior during the expansions of earlier cycles.

Instead of following the usual date sequence, as in charts 1 and 2, the data in this chart are aligned according to the strategic points of the business cycle. Each of the included series is separated into four segments which encompass the three complete business cycles since 1948 and the current expansion. These segments are aligned so that the trough dates all fall at the same point on the horizontal scale and so that the levels of the preceding peaks all fall at the same point on the vertical scale.

A similar chart, based on specific cycle dates, was previously included in this report but has been discontinued for the present.

HOW TO READ CHARTS 1 AND 2

Peak (P) of cycle indicates end of expansion and beginning of Recession (shaded areas) as designated by NBER.

CHART 1 — Business Cycle Series

Trough (T) of cycle indicates end of recession and beginning of Expansion (white areas) as designated by NBER.

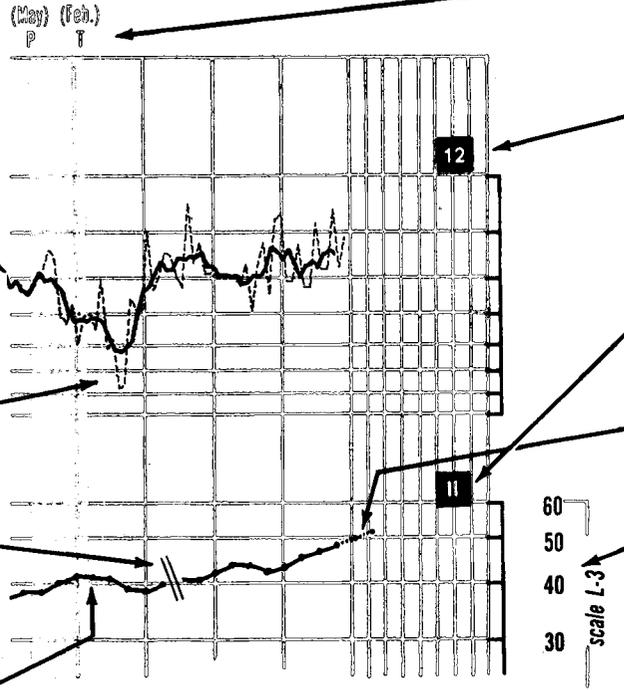
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Solid line with plotting points indicates quarterly data.



Arabic number indicates latest month for which data are plotted. ("12" = December)

Roman number indicates latest quarter for which data are plotted. ("II" = second quarter)

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Various scales are used to highlight the patterns of the individual series. "Scale A" is an arithmetic scale, "scale L'1" is a logarithmic scale with 1 cycle in a given distance, "scale L'2" is a logarithmic scale with 2 cycles in that distance, etc. The scales should be carefully noted because they show whether or not the plotted lines for various series are directly comparable.

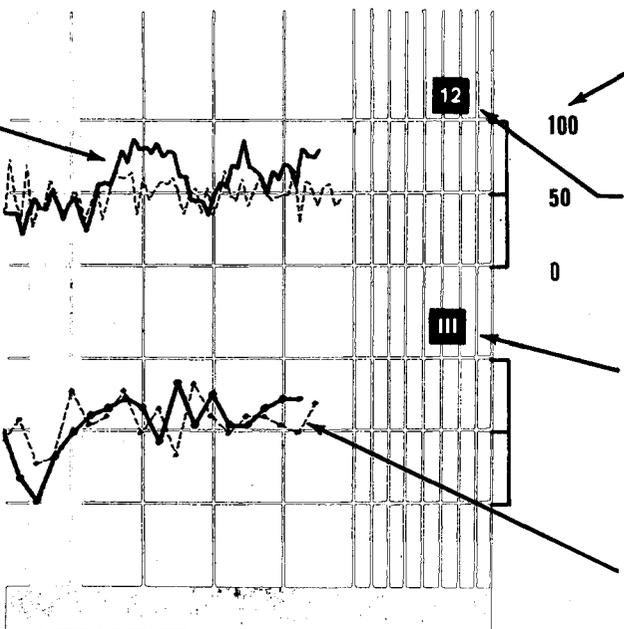
CHART 2 — Diffusion Indexes

Solid line indicates monthly data over 6- or 9-month spans.

Broken line indicates monthly data over 1-month spans.

Solid line with plotting points indicates quarterly data over various spans.

* Many of the more irregular series are shown in terms of their MCD moving averages as well as their actual monthly data. In such cases, the 4-, 5-, or 6-term moving averages are plotted 1½, 2, or 2½ months, respectively, behind the actual data. See page 2 for a description of MCD moving averages.



Scale shows percent of components rising.

Arabic number indicates latest month for which data are used in computing the indexes. ("12" = December)

Roman number indicates latest quarter for which data are used in computing the indexes. ("III" = third quarter)

Broken line with plotting points indicates quarterly data over various intervals. This line is also used to indicate anticipated quarterly data.

DESCRIPTIONS AND PROCEDURES

INTRODUCTION

Students of economic conditions describe the business cycle as consisting of alternating periods of expansion and contraction in production, employment, income, money flows, prices, and other economic processes. The fluctuations take place in a concerted manner, but not simultaneously. Once an expansion gets underway, it spreads from firm to firm, from industry to industry, from area to area, and from process to process, cumulating until a cyclical peak in aggregate activity is reached. Even while expansion is widespread during the upward phase of the business cycle, some activities continue to move in the opposite direction. Declines begin to spread as the expansion nears its peak and continue to spread even faster after the peak has been passed. But some activities continue to expand during the general contraction. Before long these expansions become stronger and more widespread. When they begin to dominate the situation, the upturn in aggregate activity has arrived and a new expansion is underway. This sequence is recurrent, but not periodic.

The causal relations among these various economic processes are primarily responsible for the cumulative nature of cyclical forces, and explain why expansion eventually turns into recession and recession into expansion. Cyclical fluctuations in production and employment are preceded by fluctuations in measures which relate to future rather than to current production—measures such as new orders for durable goods, the formation of new business enterprises, and accessions to payrolls. They are followed by fluctuations in various types of economic costs, such as labor costs, interest rates, fulfillment of long-term commitments, and holdings of inventories and of debts.

Although this pattern has been characteristic of American economic history, today many economists do not consider it inevitable.

Intensive research by the National Bureau of Economic Research (NBER) over many years has provided a list of those significant series that usually lead, those that usually move with, and those that usually lag behind cyclical movements in aggregate economic ac-

tivity. The series have been grouped and classified by the NBER as "leading", "roughly coincident", or "lagging" indicators. These indicators are defined as follows:

- ▶ *NBER Leading Indicators.*—Series that usually reach peaks or troughs before those in aggregate economic activity as measured by the roughly coincident series (see below). One group of these series pertains to activities in the labor market, another to orders and contracts, and so on.
- ▶ *NBER Roughly Coincident Indicators.*—Series that are direct measures of aggregate economic activity or move roughly together with it; for example, nonagricultural employment, industrial production, and retail sales.
- ▶ *NBER Lagging Indicators.*—Series, such as new plant and equipment expenditures and manufacturers' inventories, that usually reach turning points after they are reached in aggregate economic activity.

Other U.S. series with business cycle significance are included in this report. 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.

The list of series covered and sources of the basic data are shown on the back cover of this report. Series numbers are for identification only and do not reflect series relationships or order.

METHOD OF PRESENTATION

Data are shown in this report in three general categories, as follows:

- ▶ *Basic Data* (chart 1 and tables 1 and 2).—Data are shown for business cycle indicators, additional

U.S. series with business cycle significance, and industrial production indexes for selected countries. 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* (chart 2 and tables 3 to 5).— These are measures that aid in forming a judgment of the imminence of a turning point in the business cycle, determining the extent of current changes in different parts of the economy, and pointing to developments in particular industries and places.
- ▶ *Cyclical Patterns* (chart 3 and tables 6 and 7).— Current cyclical levels are compared with levels 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.

DESIGNATION OF BUSINESS CYCLE TURNING POINTS

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

Monthly business cycle peaks and troughs have been dated by the NBER for the period 1854-1961. Over this span, expansion has prevailed 61 percent of the time and contraction, 39 percent. If war periods are disregarded, expansion has prevailed 56 percent of the time and contraction, 44 percent.

SEASONAL AND RELATED STATISTICAL ADJUSTMENTS

Adjustments for normal seasonal fluctuations are often necessary to bring out the underlying cyclical trends of a series. Such adjustments allow for periodic intra-year variations resulting chiefly from normal differences in weather conditions during the year and from various institutional arrangements. Some series contain considerable variation attributable to the number of working or trading days in each month. An additional adjustment is necessary in such cases to reduce this variation. Variations due to holidays are usually accounted for by the seasonal adjustment process; how-

ever, there are some cases in which a separate holiday adjustment is necessary for holidays with variable dates. Such a case is retail sales of apparel which is affected strongly by the date of Easter and, to a lesser degree, by the dates of Labor Day and Thanksgiving.

In general, the seasonal adjustment process is designed to adjust for *average* weather conditions but not for the dispersion about that average. Thus, some seasonally adjusted series, such as housing starts, will tend to be low in months of unusually bad weather and high during unusually good weather. At the Bureau of the Census, studies have been started on some series to determine the effects of abnormal weather. Although it eventually may be possible, Census methods do not at present make any adjustments for such variations.

Most of the series contained in this report are presented in seasonally adjusted form. Unadjusted data are used only for those series which appear to have no pattern of seasonal variation. (Unadjusted series are identified in table 2.) In most cases, the seasonally adjusted data used for a series are the official figures released by the source agency; therefore, several different methods of seasonal adjustment are involved. In addition, 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. For these series, seasonal adjustments have been developed by either the NBER or the Census Bureau. The adjustment factors for these series, derived by Census Method II, are shown in appendix D. Factors for series which are the sums of seasonally adjusted components or which are based on unpublished source data are not shown.

MCD MOVING AVERAGES

MCD (months for cyclical dominance) is an estimate of the appropriate span over which to observe the cyclical movements in a monthly series. This span is usually longer than a single month because month-to-month changes are often dominated by erratic movements, but shorter than the frequently used 12-month span (change from the same month a year ago), and is different for different series (see appendix C for MCD values and method of computation).

MCD is, on average, the first span of months for which the average change for the cyclical factor is greater than that of the irregular factor and remains so. It is small for smooth series and large for irregular series. The month-to-month differences between moving averages of the period equal to MCD are commensurate with the differences between seasonally

adjusted values separated by the same MCD span; thus, the month-to-month differences in a 3-month moving average are commensurate with differences in seasonally adjusted values over 3-month spans. MCD moving averages all have about the same degree of smoothness. Consequently, MCD moving averages of highly irregular series, such as business failures and Federal cash payments, will show their cyclical movements about as clearly as the seasonally adjusted data for such smooth series as industrial production.

MCD moving averages are shown in chart 1 for all series with an MCD of "5" or more. To provide an indication of the variation about these moving averages, seasonally adjusted data are also plotted beginning with 1958. Although not so smooth as more powerful moving averages (such as the weighted 13-term Henderson curve), the MCD curve is more current and has a smaller rounding bias around business cycle peaks and troughs. On balance, the MCD curve seems to offer a reasonable compromise in terms of currency, smoothness, and fidelity to the patterns of business cycle fluctuations.

Because of advance reporting and preliminary seasonal factors, the MCD's for current data are usually larger than those computed from historical series and shown in appendix C. MCD is usually computed for a fairly long period, one covering both expansions and contractions. Since the pace of change varies from phase to phase of the business cycle, such a measure will not provide an accurate estimate of the span over which to estimate cyclically significant changes at all times. Thus, MCD computed for the period 1953-63 is likely to be too high during the early stages of recovery when expansion has usually been rapid and too low during the late stages of expansion when the rate of advance has usually been small. This limitation should be borne in mind when making use of this measure.¹

ANALYTICAL MEASURES OF CURRENT CHANGE

Three kinds of analytical measures are presented—timing distributions, diffusion indexes, and directions of change. These measures aid in forming a judgment of the 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.

¹ For a more complete description of MCD and its use in studying economic series, see *Business Cycle Indicators*, Geoffrey H. Moore, editor; National Bureau of Economic Research, Inc., vol. 1, ch. 18, "Statistics for Short-Term Economic Forecasting," by Julius Shiskin (Princeton University Press: 1961).

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. This timing distribution shows 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 presented 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 leading and roughly coincident business cycle indicators are scanned each month. During a business cycle expansion, the date of the high value for each series is recorded. (For inverted series—that is, series with negative conformity to the business cycle—dates of low values are taken.) 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 may be disregarded, although it is, of course, difficult to identify an erratic value, particularly for the current month.

The letter "H" is used in table 2 to identify and highlight the current high values during the expansion. The highs designated during the current cyclical phase will not necessarily be the specific cycle peaks. (See appendix B.) As new high levels are reached during the expansion, the current highs will be moved ahead. Comparisons of the current timing distributions with those for periods around earlier business cycle 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 simply reflect a short reversal in the upward movement.

Diffusion Indexes

Diffusion indexes are simple summary measures of groups of economic series. They express, for a given aggregate series, the percent of the series components

which have risen over given spans 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 and widespread declines with sharp reductions in aggregate activity.

The diffusion indexes in this report are grouped according to the timing classification of the NBER. For monthly series, comparisons are made over 1-month spans (January-February, February-March, etc.) and generally for either 6- or 9-month spans, depending upon the irregularity of the series. The indexes based on 1-month spans are more "current" but they are also more irregular than the 6- or 9-month indexes. (See chart 2.) Quarterly series are compared over 1-quarter spans, 3-quarter spans, and 4-quarter spans.

Recent research has shown that the longer-span diffusion indexes are not only smoother, but have systematically larger amplitudes than the 1-month indexes. The 1-month indexes generally have large irregular fluctuations, but the movements may be significant when important changes are taking place, particularly around cyclical turning points. Since the longer-span diffusion indexes are centered, there is an apparent loss in currency equal to one-half the span; for example, 3 months in the case of a 6-month diffusion index. However, the most recent figure for a 6-month or longer-span index does provide the latest available information on changes *over that span*. If a significant reversal has taken place *within that span*, the 1-month indexes are likely to reveal it. Presentation of both 1-month and longer-span diffusion indexes provides an opportunity for the user to take advantage of the best features of each in interpreting current changes.

Series numbers preceded by the letter "D" designate diffusion indexes. When one of these numbers corresponds to the number of a basic indicator series, 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 6. Diffusion indexes not computed from basic series components are assigned new numbers.

Diffusion indexes that are based on business expectations 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-Index Components

Many of the component series used to make up the diffusion indexes are shown in table 5. Where possible, recent basic data for the components are shown in part A. In part B, directions of change in these components are indicated for consecutive months and, depending upon the irregularity of the diffusion index, for either 6- or 9-month spans. The directions of change are indicated by "+" for rising, "o" for unchanged, and "-" for falling. (In counting the number of components rising, a "o" is counted as one-half.)

This table provides a convenient view of changing business conditions and is helpful in making an economic interpretation of the movements in the more highly aggregated statistical measures. That is, it shows which economic activities went up, which went down, and how long such movements have persisted. The table also helps 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 various series 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 whether the current cyclical phase is an expansion or contraction.

Expansions are compared in one way by measuring changes from the immediately preceding peak levels. In table 6 of this report, data for the latest month in the current expansion (shown by number of months from the February 1961 trough) are compared with the May 1960 reference peak. For each earlier expansion, data for a like period (same number of months from the trough of the expansion) are compared with the preceding reference peak. This type of comparison is designated as changes computed *from reference peak levels and reference trough dates*. This type of comparison shows whether, and by how much, the current level of activity exceeds or falls short of the level at the preceding business cycle peak, and how the current situation compares, in this respect, with earlier expansions. For those earlier periods of expansion that were shorter than the current one, the comparisons reflect status at reference peak levels.

Expansions are also compared by computing changes from *reference trough levels and reference trough dates* (table 7). For the current expansion, this type of comparison measures the extent of the rise from the trough level (February 1961) to the level at the current month. For each earlier expansion, data for a like period (same number of months from the trough of the expansion) are compared with the level at the trough. The same situation exists here as for the comparisons shown in table 6: For earlier expansions that were shorter than the current one, the comparisons show the status at reference peak levels.

Contractions can be 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 changes from *reference peak levels and reference peak dates*. These comparisons will be made during a contraction period.

In addition to comparing cyclical fluctuations on the basis of reference dates, which are the same for all series, similar comparisons may be made using the specific peak and trough dates identified for each series. (Appendix B lists specific dates for a selected group of series.) Such comparisons would be based on changes from *specific peak levels and specific trough dates* and on changes from *specific trough levels and specific trough dates*. Although these specific cycle comparisons are not currently included in this report, they have been shown in previous issues.

Nearly all series have undergone changes in definition, coverage, or estimation procedure since 1919; therefore, the historical comparisons are to be considered only approximate. Furthermore, it is sometimes necessary to use data for a closely related series for cycles prior to the period covered by the series used currently. The principal substitutions of this type are as follows:

7. New private nonfarm dwelling units started (prior to 1948: Residential building contracts, floor space, by F. W. Dodge Corp.)
41. Number of employees in nonagricultural establishments (prior to 1929: Factory employment)
52. Personal income (prior to 1929: Quarterly data as published by Barger and Klein)
54. Sales of retail stores (prior to 1929: Department store sales)
62. Index of labor cost per unit of output, total manufacturing (prior to 1948: Production worker wage cost per unit).

Two types of charts are used to highlight the cyclical patterns of the business cycle series: Historical time series and cyclical comparisons.

Historical Time Series (charts 1 and 2)

These charts show cyclical fluctuations against the background of expansions and contractions in general business activity from 1948 to the current month. Shaded areas on the charts indicate periods of business cycle contractions between business cycle peak dates (beginnings of shaded areas) and business cycle trough dates (ends of shaded areas). The shading for a new contraction will be entered only after a trough has been designated.

Several different ratio and arithmetic scales are used to highlight the cyclical movements of the various series. The scale selected for each series is identified in the margin of the chart. Rates of change of various series can be compared with each other only where scales are identical. See the diagram, page 6, for additional help in using these charts.

Cyclical Comparisons (chart 3)

This chart compares the movements of selected series during the current business cycle with their movements through the corresponding phases of previous business cycles. Actually, it is an extension of the concept behind table 6. While table 6 makes a comparison at one point in time, chart 3 shows these comparisons over the course of the whole business cycle. These comparisons facilitate judgments on the vigor of the current expansion relative to behavior during the expansions of earlier cycles.

Instead of following the usual date sequence, as in charts 1 and 2, the data in this chart are alined according to the strategic points of the business cycle. Each of the included series is separated into four segments which encompass the three complete business cycles since 1948 and the current expansion. These segments are alined so that the trough dates all fall at the same point on the horizontal scale and so that the levels of the preceding peaks all fall at the same point on the vertical scale.

A similar chart, based on specific cycle dates, was previously included in this report but has been discontinued for the present.

HOW TO READ CHARTS

Peak (P) of cycle indicates end of expansion and beginning of Recession (shaded areas) as designated by NBER.

CHART 1 — Business Cycle Series

Trough (T) of cycle indicates end of recession and beginning of Expansion (white areas) as designated by NBER.

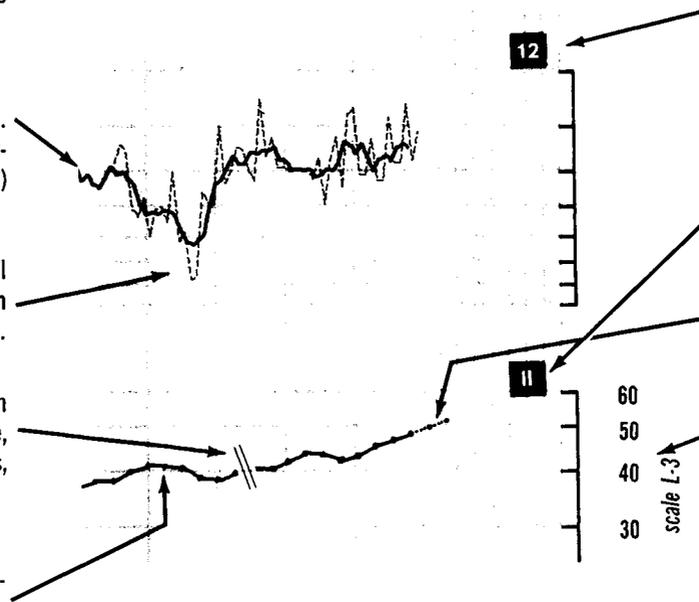
See **back cover** for complete titles and sources of series.

Solid line indicates monthly data. (Data may be actual monthly figures or MCD moving averages.*)

Broken line indicates actual monthly data for series where an MCD moving average* is plotted.

Parallel lines indicate a break in continuity (data not available, changes in series definitions, extreme values, etc.)

Solid line with plotting points indicates quarterly data.



Arabic number indicates latest month for which data are plotted. ("12" = December)

Roman number indicates latest quarter for which data are plotted. ("II" = second quarter)

Dotted line indicates anticipated data.

Various scales are used to highlight the patterns of the individual series. "Scale A" is an arithmetic scale with 1 cycle in a given distance, "scale L'1" is a logarithmic scale with 2 cycles in that distance, etc. The scales should be carefully noted because they show whether or not the plotted lines for various series are directly comparable.

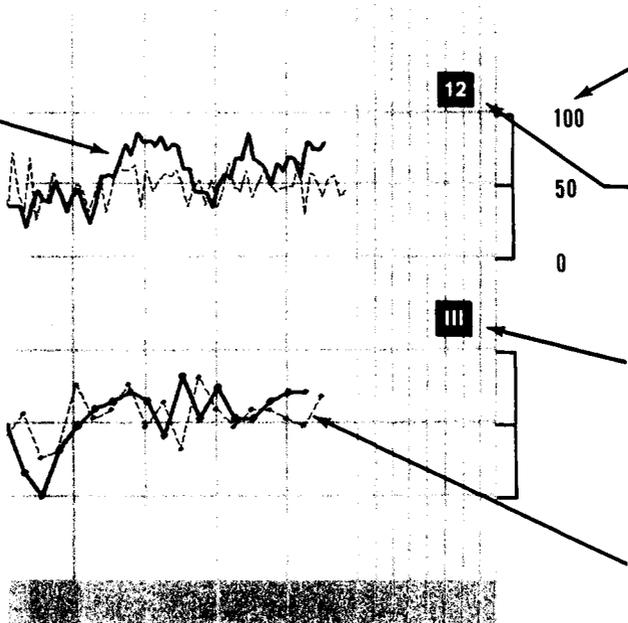
CHART 2 — Diffusion Indexes

Solid line indicates monthly data over 6- or 9-month spans.

Broken line indicates monthly data over 1-month spans.

Solid line with plotting points indicates quarterly data over various spans.

* Many of the more irregular series are shown in terms of their MCD moving averages as well as their actual monthly data. In such cases, the 4-, 5-, or 6-term moving averages are plotted 1½, 2, or 2½ months, respectively, behind the actual data. See page 2 for a description of MCD moving averages.



Scale shows percent of components rising.

Arabic number indicates latest month for which data are used in computing the indexes. ("12" = December)

Roman number indicates latest quarter for which data are used in computing the indexes. ("III" = third quarter)

Broken line with plotting points indicates quarterly data over various intervals. This line is also used to indicate anticipated quarterly data.

DESCRIPTIONS AND PROCEDURES

INTRODUCTION

The business cycle is generally described as consisting of alternating periods of expansion and contraction in aggregate economic activity—that is, the complex of activities represented by such concepts as total production, employment, income, consumption, trade, and the flow of funds. Although a recurrent pattern has been characteristic of American economic history, many economists do not consider it inevitable.

The causal relations among various economic processes are primarily responsible for the cumulative nature of cyclical forces and explain why expansions have eventually turned into recessions and recessions into expansions. Cyclical fluctuations in production and employment are preceded by fluctuations in measures which relate to future rather than current production—measures such as new orders for durable goods, formation of new business enterprises, and accessions to payrolls. They are followed by fluctuations in various economic costs, such as labor costs, interest rates, fulfillment of long-term commitments, and holdings of inventories and debts.

TIMING CLASSIFICATION

On the basis of many years of research, the National Bureau of Economic Research (NBER) has compiled a list of indicators of aggregate economic activity and has classified these indicators according to whether they usually lead, roughly coincide with, or lag behind the cyclical movements in aggregate activity. The 1966 list, as issued by the NBER, is the basis for the presentation of U.S. series in *BUSINESS CYCLE DEVELOPMENTS*. Prior to April 1967, their 1960 list was used. The series have been grouped and classified by the NBER as “leading,” “roughly coincident,” or “lag-

ging” indicators. These indicators are described as follows:

NBER Leading Indicators.—Series that usually reach peaks or troughs before those in aggregate economic activity as measured by the roughly coincident series (see below). One group of these series pertains to orders and contracts, another to inventory investment, and so on.

NBER Roughly Coincident Indicators.—Series that are direct measures of aggregate economic activity or move roughly together with it; for example, non-agricultural employment, industrial production, and retail sales.

NBER Lagging Indicators.—Series, such as new plant and equipment expenditures and manufacturers' inventories, that usually reach turning points after they are reached in aggregate economic activity.

Also included in BCD are (a) “Other selected U.S. series,” economic activities which are important in analyzing business cycles but have a less consistent relation to them, and (b) industrial production indexes for several countries which have important trade relations with the United States.

The business cycle turning dates used in this report are those designated by the NBER. They mark the approximate dates when aggregate economic activity reached its cyclical high (peak) or low (trough) levels. As a matter of general practice, a business cycle turning date will not be designated until at least 6 months after it has occurred. (See appendix A for peak and trough dates.)

ECONOMIC PROCESS CLASSIFICATION

A secondary principle of classification, economic process, supplements the timing classification. All series are cross-classified according to these two principles. The major economic process categories are employment and unemployment; production, income, consumption, and trade; fixed capital investment; inventories and inventory investment; prices, costs, and profits; money and credit; foreign trade and payments; and Federal Government activity.

"SHORT LIST" OF INDICATORS

A short, substantially unduplicated list of principal indicators provides a convenient way of summarizing the current situation and outlook. The NBER has identified, for this purpose, a short list of 25. This list includes 12 leading, 7 roughly coincident, and 6 lagging indicators; 21 are monthly and 4 are quarterly. These series are identified throughout BCD.

METHOD OF PRESENTATION

This report consists of three major sections as follows:

Basic Data (chart 1, tables 1 and 2).—Data for all series are shown for the current and prior periods in both graphic and tabular form. Thus, a broad view of past and current business cycle fluctuations is provided.

Analytical Measures (chart 2, tables 3 to 5).—Measures are presented which help to determine the magnitude and scope of current changes in different processes, industries, and areas, and aid in evaluating the prospects of a turning point in the business cycle.

Cyclical Patterns (chart 3).—Comparisons are made between current cyclical levels and previous business cycles.

A list of titles and sources for all series is shown on the back cover of this report. The series numbers are for identification only and do not reflect series relationships or order.

CONCEPTS AND PROCEDURES

Several other concepts and procedures used in this report are summarized below:

Adjustments for average seasonal fluctuations are often necessary to bring out the underlying cyclical trends of a series. In most cases, the seasonally ad-

justed data used for a series are the official figures released by the source agency. In addition, 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. The *seasonal adjustment* process usually accounts for variations due to holidays; however, there are some cases in which a separate *holiday adjustment* is needed for holidays with variable dates.

Months for cyclical dominance (*MCD*) is an estimate of the appropriate span over which to observe the cyclical movements in a monthly series. *MCD moving averages* are shown in chart 1 for series with an *MCD* of "5" or more; however, to provide an indication of the variation about these moving averages, monthly data are also plotted.

Diffusion indexes are simple summary measures which express what percentage of the components of an aggregate series has risen over given time spans. Their turning points tend to lead those of the aggregate. Series numbers preceded by "D" designate diffusion indexes. Many of the component series used to make up the diffusion indexes are shown in table 5.

During the current expansion, *high values* for the indicators are identified in table 2. These values are not necessarily cyclical peak values, but are simply the highest values reached to date.

Certain *appendix materials* are presented regularly in this report. These materials include historical data, adjustment factors, peak and trough dates, and other information helpful in interpreting trends in the indicators.

REFERENCES

Fuller explanations of the use of indicators of aggregate economic activity in analyzing current business conditions and prospects may be found in the following references:

- (1) Alexander, Sidney S. "Rate of Change Approaches to Forecasting—Diffusion Indexes and First Differences," *The Economic Journal*, June 1958, pp. 288-301.
- (2) Broida, Arthur L. "Diffusion Indexes," *American Statistician* vol. IX, No. 2 (June 1955), pp. 7-16.
- (3) Burns, Arthur F. and Mitchell, Wesley C. *Measuring Business Cycles*. New York: National Bureau of Economic Research, Inc., 1946.

- (4) Daly, D. J. and White, D. A. "Economic Indicators in the 1960's," *Proceedings of the Business and Economics Statistics Section, American Statistical Association*, August 1966, pt. V, pp. 64-75.
- (5) Gordon, R. A. "Alternative Approaches to Forecasting: The Recent Work of the National Bureau," *The Review of Economics and Statistics* vol. XLIV, No. 3 (August 1962), pp. 284-291.
- (6) Lempert, Leonard H. "Leading Indicators," *How Business Economists Forecast* (William F. Butler and Robert A. Kavesh, Ed.) pt. I, ch. 2, pp. 31-47. Englewood Cliffs, N.J.: Prentice-Hall, 1966.
- (7) Moore, Geoffrey H., Editor, *Business Cycle Indicators*. New York: National Bureau of Economic Research, Inc., 1961.
- (8) Moore, Geoffrey H. and Shiskin, Julius. *Indicators of Business Expansions and Contractions*, Occasional Paper 103. New York: National Bureau of Economic Research, Inc., 1967.
- (9) Morris, Frank E. "The Predictive Values of the National Bureau's Leading Indicators," *Business Cycle Indicators* vol. I, ch. 4, pp. 110-119. New York: National Bureau of Economic Research, Inc., 1961.
- (10) Okun, Arthur M. "On the Appraisal of Cyclical Turning Point Predictors," *Journal of Business*, April 1960, pp. 101-120.
- (11) Shiskin, Julius. *Business Cycle Indicators: The Known and the Unknown*. Paper presented at the 34th session of the International Statistical Institute, Ottawa, Canada, August 24, 1963. Washington: Bureau of the Census, 1963.
- (12) Shiskin, Julius. *Signals of Recession and Recovery*, Occasional Paper 77. New York: National Bureau of Economic Research, Inc., 1961.

HOW TO READ CHARTS 1 AND 2

Peak (P) of cycle indicates end of expansion and beginning of Recession (shaded areas) as designated by NBER.

Series numbers are for identification only and do not reflect series relationships or order. Series are arranged in charts and tables according to their classification by timing and economic process.

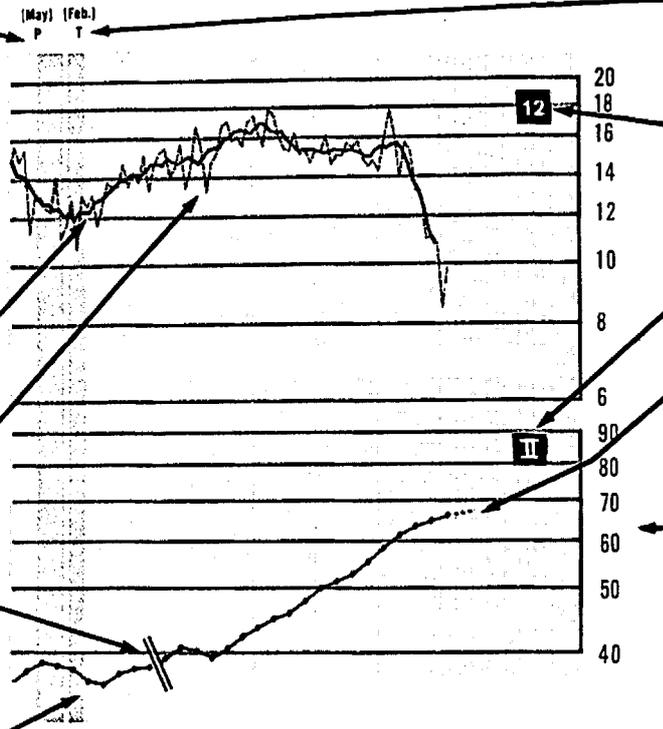
Solid line indicates monthly data. (Data may be actual monthly figures or MCD moving averages.*)

Broken line indicates actual monthly data for series where an MCD moving average* is plotted.

Parallel lines indicate a break in continuity (data not available, changes in series definitions, extreme values, etc.)

Solid line with plotting points indicates quarterly data.

CHART 1 – Business Cycle Series



Trough (T) of cycle indicates end of recession and beginning of Expansion as designated by NBER.

Arabic number indicates latest month for which data are plotted. ("12" = December)

Roman number indicates latest quarter for which data are plotted. ("II" = second quarter)

Dotted line indicates anticipated data.

Various scales are used to highlight the patterns of the individual series. "Scale A" is an arithmetic scale, "scale L-1" is a logarithmic scale with 1 cycle in a given distance, "scale L-2" is a logarithmic scale with 2 cycles in that distance, etc. The scales should be carefully noted because they show whether or not the plotted lines for various series are directly comparable.

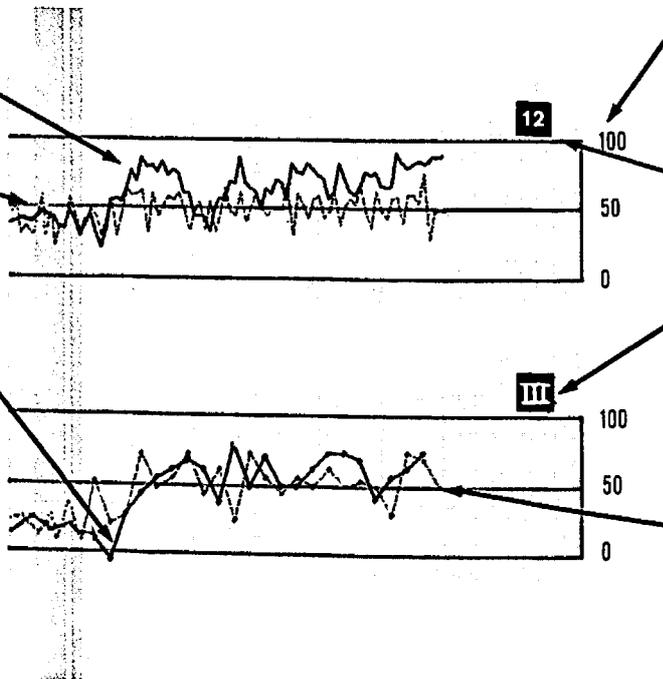
Solid line indicates monthly data over 6- or 9-month spans.

Broken line indicates monthly data over 1-month spans.

Solid line with plotting points indicates quarterly data over various spans.

* Many of the more irregular series are shown in terms of their MCD moving averages as well as their actual monthly data. In such cases, the 4-, 5-, or 6-term moving averages are plotted 1½, 2, or 2½ months, respectively, behind the actual data. See appendix C for a description of MCD moving averages.

CHART 2 – Diffusion Indexes



Scale shows percent of components rising.

Arabic number indicates latest month for which data are used in computing the indexes. ("12" = December)

Roman number indicates latest quarter for which data are used in computing the indexes. ("III" = third quarter)

Broken line with plotting points indicates quarterly data over various intervals. This line is also used to indicate anticipated quarterly data.

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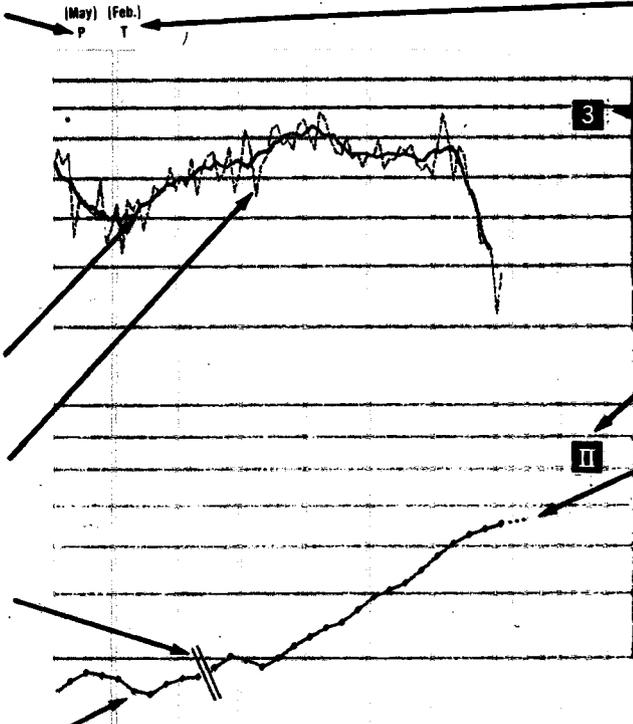
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Trough (T) of cycle indicates end of recession and beginning of Expansion as designated by NBER.

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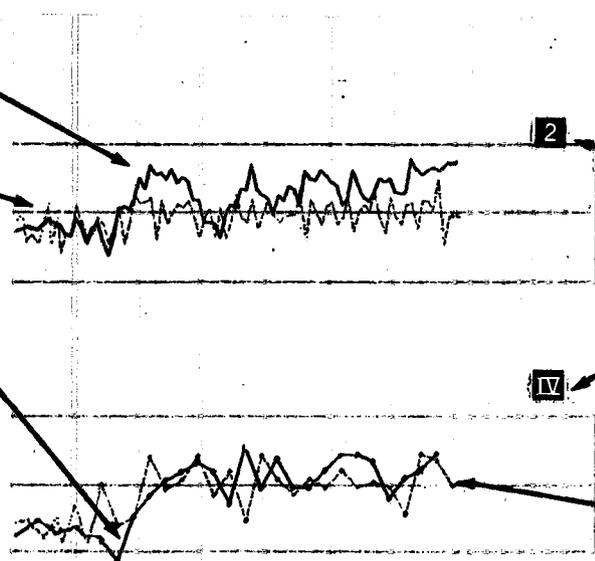
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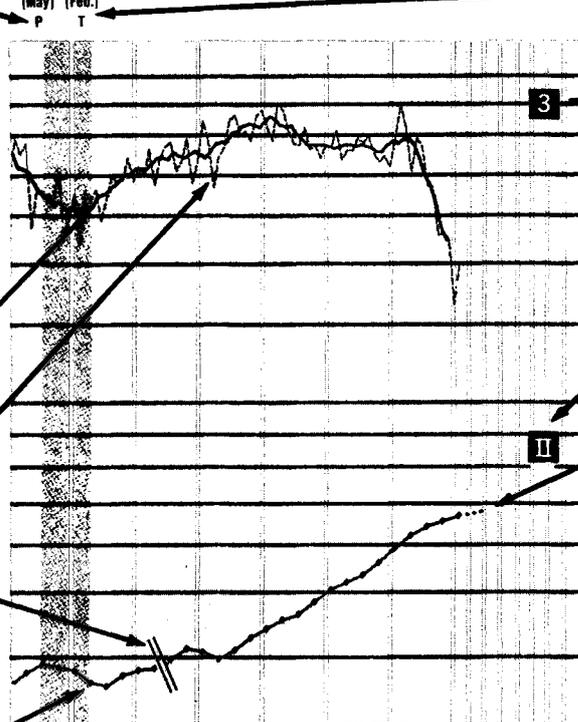
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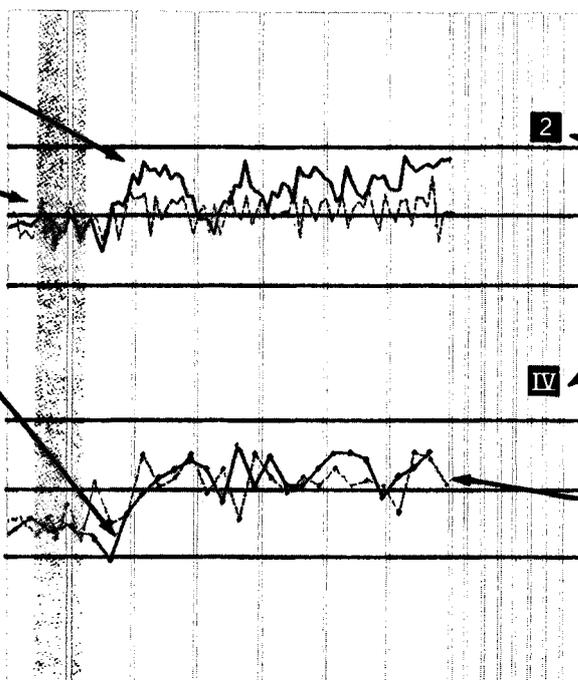
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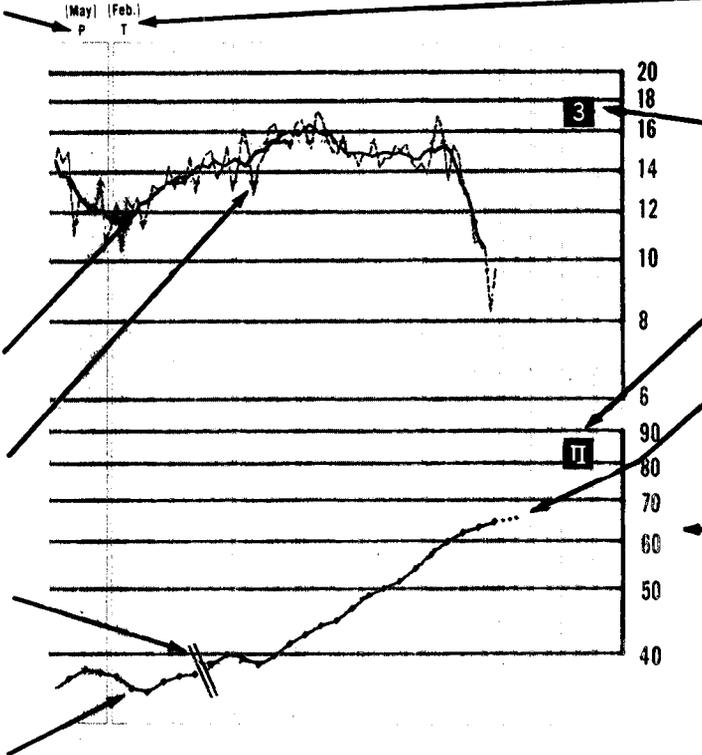
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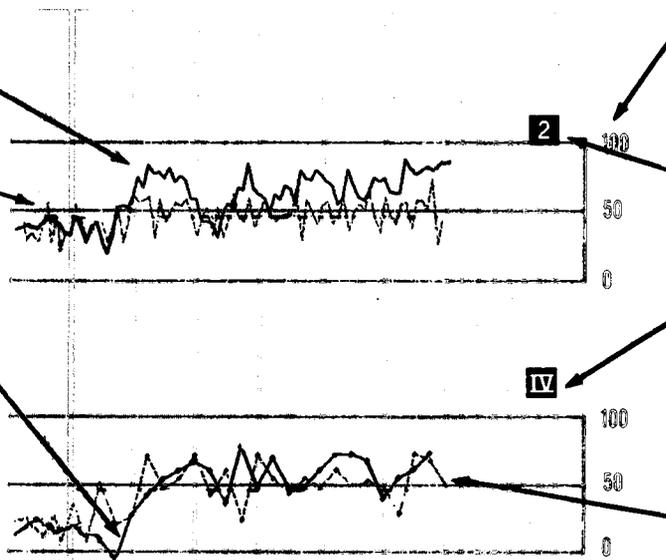
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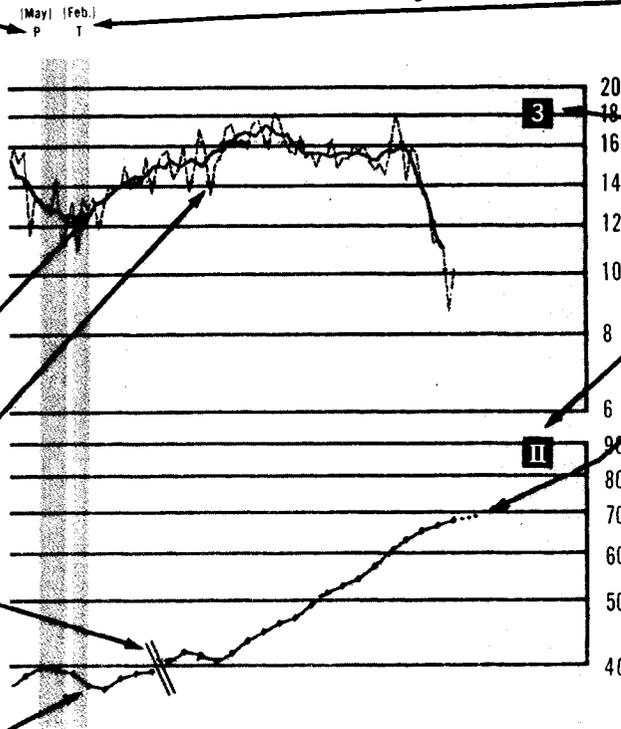
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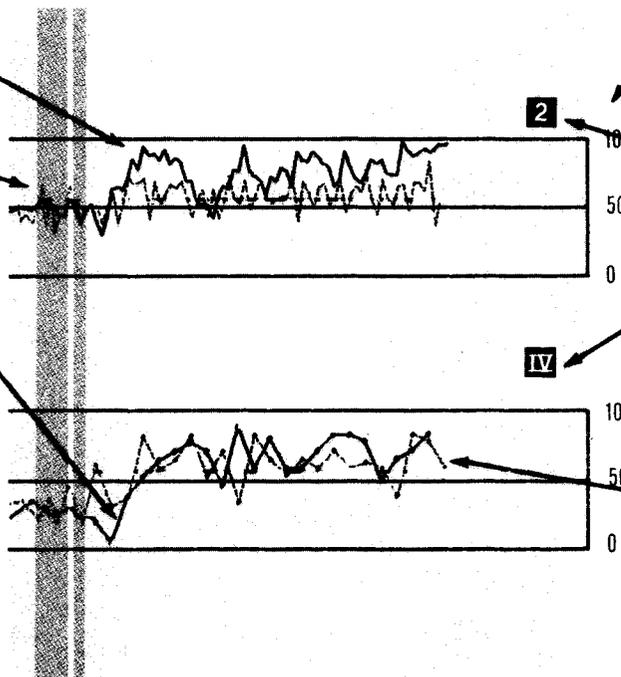
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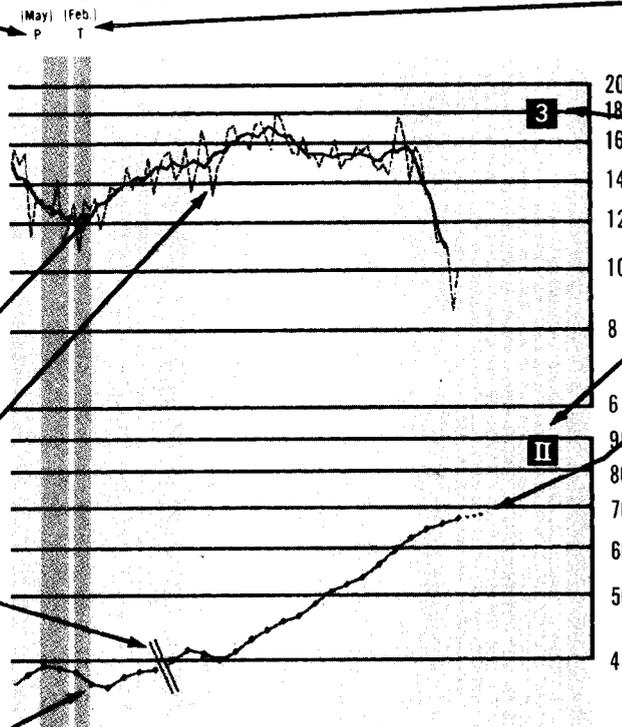
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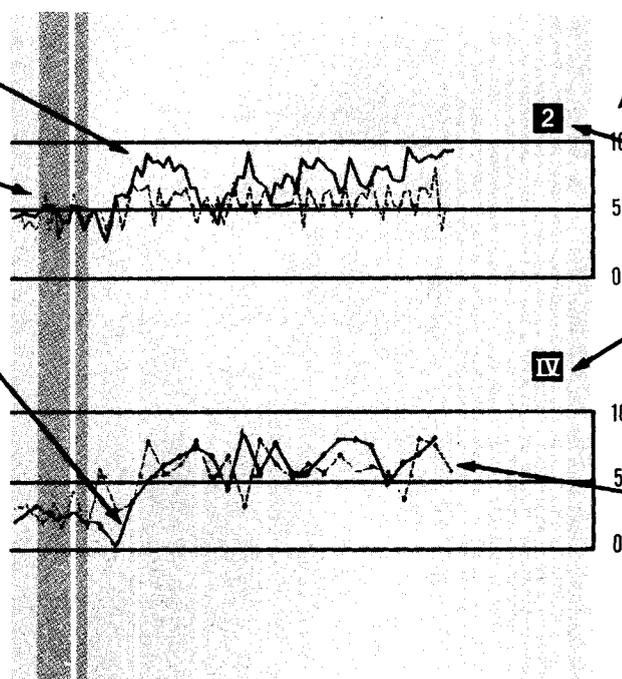
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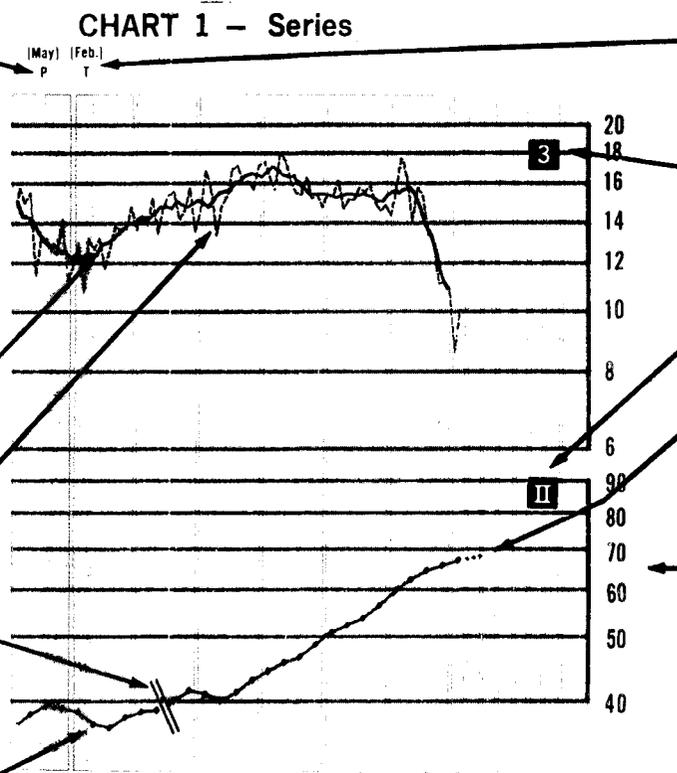
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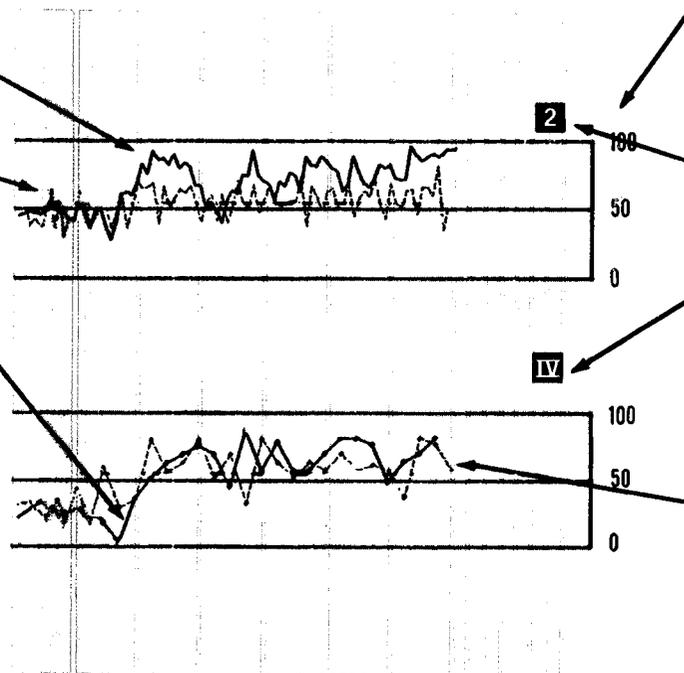
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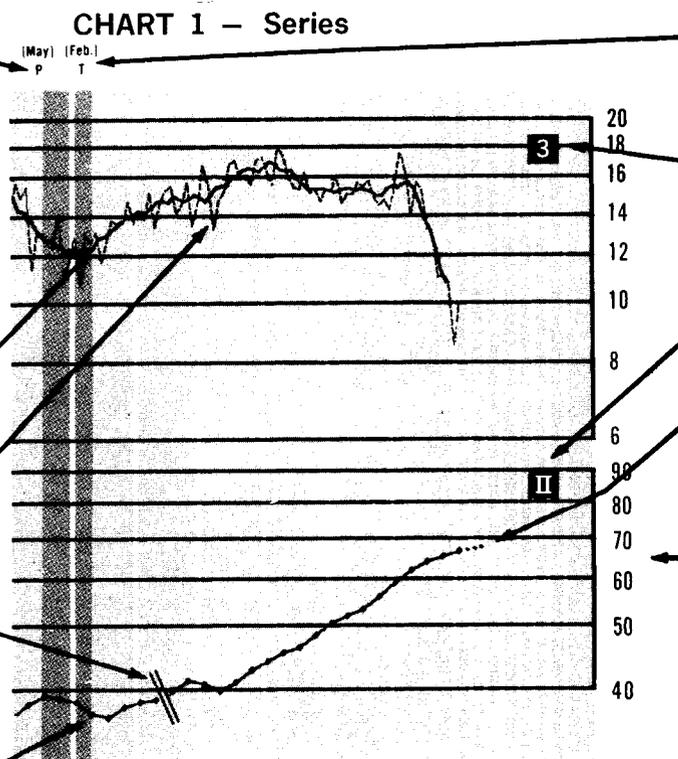
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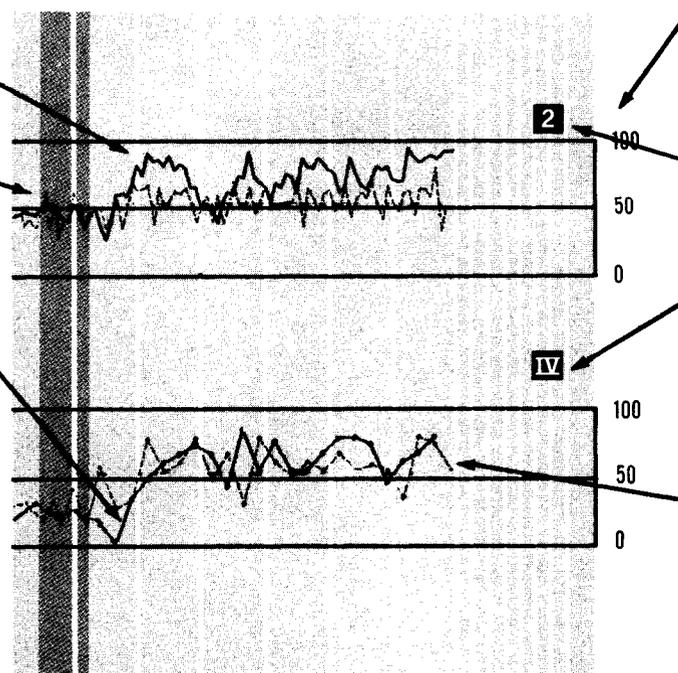
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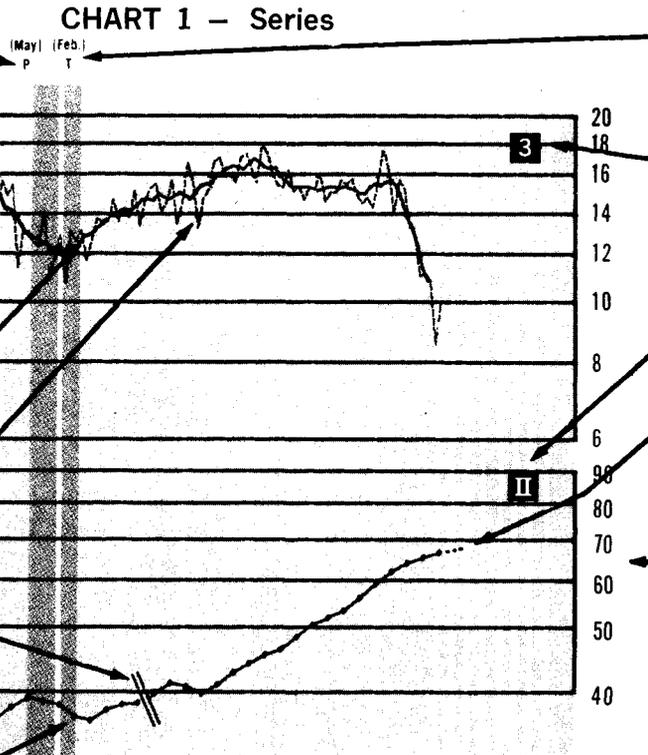
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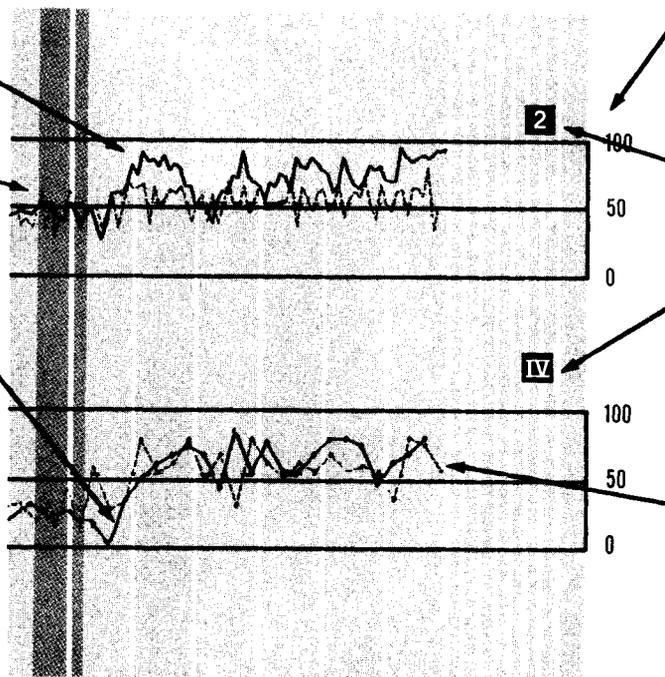
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Arabic number indicates latest month for which data are used in computing the indexes. ("2" = February)

Roman number indicates latest quarter for which data are used in computing the indexes. ("IV" = fourth quarter)

Broken line with plotting points indicates quarterly data over various intervals. This line is also used to indicate anticipated quarterly data.

HOW TO LOCATE A SERIES

To locate a series in **BCD**, consult the **Index—Series Finding Guide** in the back of the book where series are arranged into eight groups by economic process and cross referenced by timing classification in the first column. The back cover, which lists series titles (followed by a Roman numeral denoting economic process group) and sources in numerical order within each timing group, may also be helpful to some readers.

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INTRODUCTION

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The causal relations among various economic processes are primarily responsible for the cumulative nature of cyclical forces and explain why expansions have eventually turned into recessions and recessions into expansions. Cyclical fluctuations in production and employment are preceded by fluctuations in measures which relate to future rather than current production—measures such as new orders for durable goods, formation of new business enterprises, and accessions to payrolls. They are followed by fluctuations in various economic costs, such as labor costs, interest rates, fulfillment of long-term commitments, and holdings of inventories and debts.

TIMING CLASSIFICATION

On the basis of many years of research, the National Bureau of Economic Research (NBER) has compiled a list of indicators of aggregate economic activity and has classified these indicators according to whether they usually lead, roughly coincide with, or lag behind the cyclical movements in aggregate activity. The 1966 list, as issued by the NBER, is the basis for the presentation of U.S. series in *BUSINESS CYCLE DEVELOPMENTS*. Prior to April 1967, their 1960 list was used. The series have been grouped and classified by the NBER as “leading,” “roughly coincident,” or “lag-

ging” indicators. These indicators are described as follows:

Leading Indicators.—Series that usually reach peaks or troughs before those in aggregate economic activity as measured by the roughly coincident series (see below). One group of these series pertains to orders and contracts, another to inventory investment, and so on.

Roughly Coincident Indicators.—Series that are direct measures of aggregate economic activity or move roughly together with it; for example, nonagricultural employment, industrial production, and retail sales.

Lagging Indicators.—Series, such as new plant and equipment expenditures and manufacturers’ inventories, that usually reach turning points after they are reached in aggregate economic activity.

Also included in BCD are (a) “Other Selected U.S. Series,” economic activities which are important in analyzing business cycles but have a less consistent relation to them; (b) “U.S. Series Under Consideration,” indicators that measure important economic relationships but have not been classified by economic process and timing and, therefore, not yet incorporated into the list of 88 indicators; and (c) indexes of industrial production, consumer prices, and stock prices for several countries which have important trade relations with the United States.

The business cycle turning dates used in this report are those designated by the NBER. They mark the approximate dates when aggregate economic activity reached its cyclical high (peak) or low (trough) levels. As a matter of general practice, a business cycle turning date will not be designated until at least 6 months after it has occurred. (See appendix A for peak and trough dates.)

ECONOMIC PROCESS CLASSIFICATION

A secondary principle of classification, economic process, supplements the timing classification. All series are cross-classified according to these two principles. The major economic process categories are employment and unemployment; production, income, consumption, and trade; fixed capital investment; inventories and inventory investment; prices, costs, and profits; money and credit; foreign trade and payments; and Federal Government activity.

"SHORT LIST" OF INDICATORS

A short, substantially unduplicated list of principal indicators provides a convenient way of summarizing the current situation and outlook. The NBER has identified, for this purpose, a short list of 25. This list includes 12 leading, 7 roughly coincident, and 6 lagging indicators; 21 are monthly and 4 are quarterly. These series are identified throughout BCD.

METHOD OF PRESENTATION

This report consists of two major sections as follows:

Basic Data (chart 1, tables 1 and 2).—Data for all series are shown for the current and prior periods in both graphic and tabular form. Thus, a broad view of past and current business cycle fluctuations is provided.

Analytical Measures (chart 2, tables 3 and 4).—Measures are presented which help to determine the magnitude and scope of current changes in different processes, industries, and areas, and aid in evaluating the prospects of a turning point in the business cycle.

A list of titles and sources for all series is shown on the back cover of this report. The series numbers are for identification only and do not reflect series relationships or order.

CONCEPTS AND PROCEDURES

Several other concepts and procedures used in this report are summarized below:

Adjustments for average seasonal fluctuations are often necessary to bring out the underlying cyclical trends of a series. In most cases, the seasonally adjusted data used for a series are the official figures released by the source agency. In addition, 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. The *seasonal adjustment* process usually accounts for variations due to holidays; however, there are some cases in which a separate *holiday adjustment* is needed for holidays with variable dates.

Months for cyclical dominance (*MCD*) is an estimate of the appropriate span over which to observe the cyclical movements in a monthly series. *MCD moving averages* are shown in chart 1 for series with an *MCD* of "5" or more; however, to provide an indication of the variation about these moving averages, monthly data are also plotted.

Diffusion indexes are simple summary measures which express what percentage of the components of an aggregate series has risen over given time spans. Their turning points tend to lead those of the aggregate. Series numbers preceded by "D" designate diffusion indexes. Many of the component series used to make up the diffusion indexes are shown in table 4.

During the current expansion, *high values* for the indicators are identified in table 2. These values are not necessarily cyclical peak values, but are simply the highest values reached to date.

Certain *appendix materials* are presented regularly in this report. These materials include historical data, adjustment factors, peak and trough dates, and other information helpful in interpreting trends in the indicators.

REFERENCES

Fuller explanations of the use of indicators of aggregate economic activity in analyzing current business conditions and prospects may be found in the following references:

- (1) Alexander, Sidney S. "Rate of Change Approaches to Forecasting—Diffusion Indexes and First Differences," *The Economic Journal*, June 1958, pp. 288-301.
- (2) Broida, Arthur L. "Diffusion Indexes," *American Statistician* vol. IX, No. 2 (June 1955), pp. 7-16.
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HOW TO READ CHARTS 1 AND 2

Peak (P) of cycle indicates end of expansion and beginning of Recession (shaded areas) as designated by NBER.

Series numbers are for identification only and do not reflect series relationships or order. Series are arranged in charts and tables according to their classification by timing and economic process.

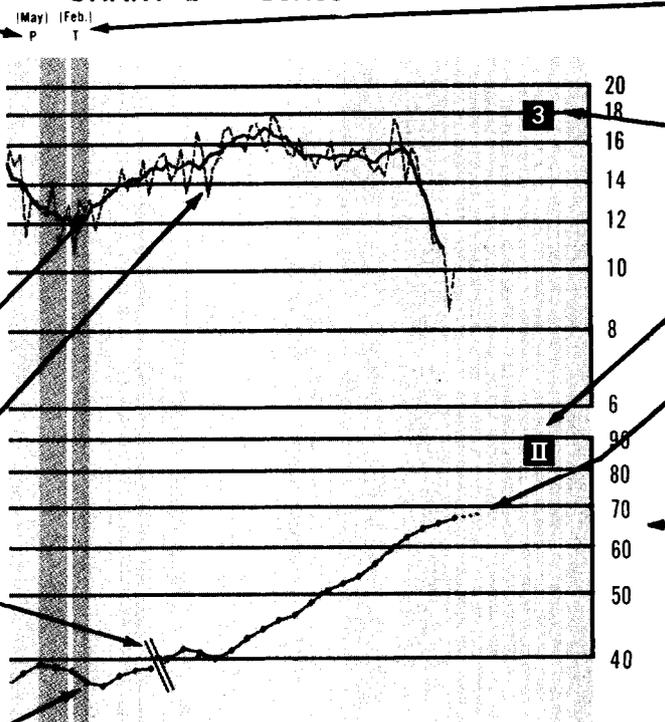
Solid line indicates monthly data. (Data may be actual monthly figures or MCD moving averages.*)

Broken line indicates actual monthly data for series where an MCD moving average* is plotted.

Parallel lines indicate a break in continuity (data not available, changes in series definitions, extreme values, etc.).

Solid line with plotting points indicates quarterly data.

CHART 1 – Series



Trough (T) of cycle indicates end of recession and beginning of Expansion as designated by NBER.

Arabic number indicates latest month for which data are plotted. ("3" = March)

Roman number indicates latest quarter for which data are plotted. ("II" = second quarter)

Dotted line indicates anticipated data.

Various scales are used to highlight the patterns of the individual series. "Scale A" is an arithmetic scale, "scale L-1" is a logarithmic scale with 1 cycle in a given distance, "scale L-2" is a logarithmic scale with 2 cycles in that distance, etc. The scales should be carefully noted because they show whether or not the plotted lines for various series are directly comparable.

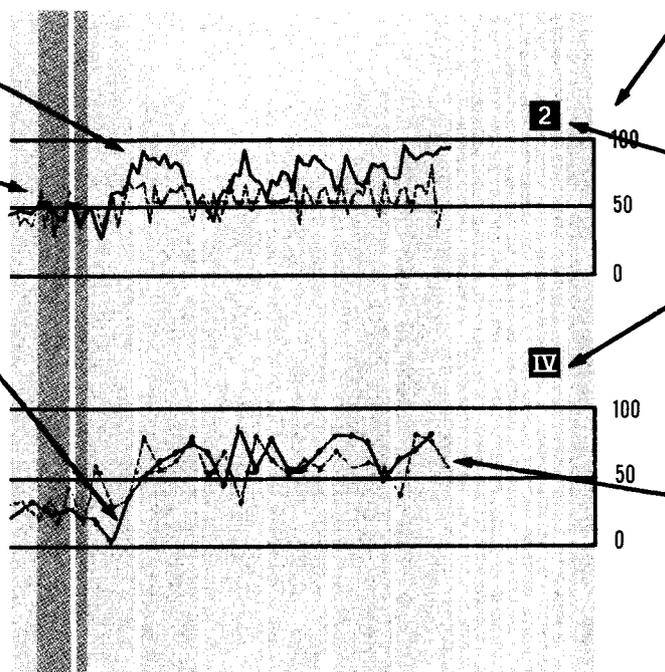
CHART 2 – Diffusion Indexes

Solid line indicates monthly data over 6- or 9-month spans.

Broken line indicates monthly data over 1-month spans.

Solid line with plotting points indicates quarterly data over various spans.

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Scale shows percent of components rising.

Arabic number indicates latest month for which data are used in computing the indexes. ("2" = February)

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Lagging Indicators.—Series, such as new plant and equipment expenditures and manufacturers' inventories, that usually reach turning points after they are reached in aggregate economic activity.

Also included in BCD are (a) “Series Unclassified by Cyclical Timing,” economic activities which are important in analyzing business cycles but have a less consistent relation to them; (b) “Series Unclassified by Cyclical Timing and Economic Process,” indicators that measure important economic relationships but have not been classified by economic process and timing and, therefore, not yet incorporated into the list of 88 indicators; and (c) indexes of industrial production, consumer prices, and stock prices for several countries which have important trade relations with the United States.

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A secondary principle of classification, economic process, supplements the timing classification. All series are cross-classified according to these two principles. The major economic process categories are employment and unemployment; production, income, consumption, and trade; fixed capital investment; inventories and inventory investment; prices, costs, and profits; money and credit; foreign trade and payments; and Federal Government activity.

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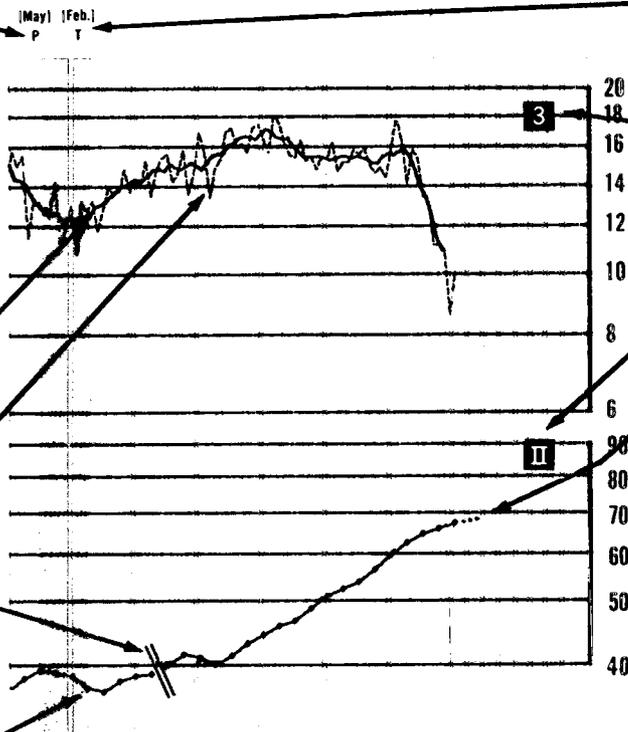
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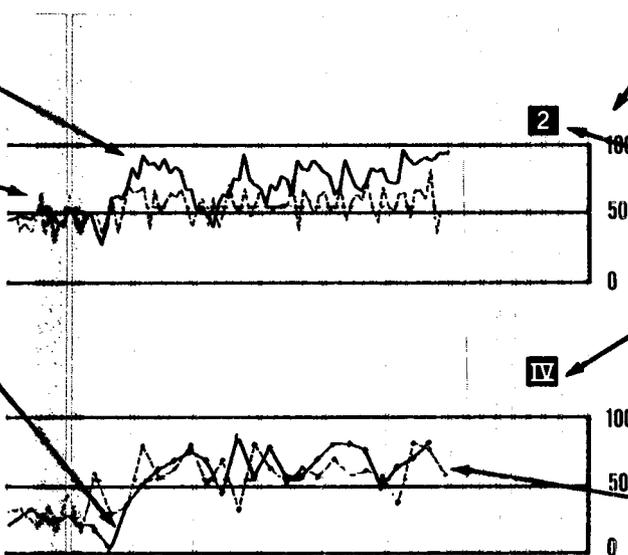
CHART 2 – Diffusion Indexes

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BACKGROUND

The National Bureau of Economic Research, Inc. (NBER) has, since 1938, maintained a list of indicators of aggregate economic activity, and has periodically subjected that list to extensive review. The third revision of the original list was published in March 1967 and in the following month became the basis for the presentation of U.S. series in BUSINESS CYCLE DEVELOPMENTS. Previous issues of BCD were based on the 1960 NBER list.

The revised list of indicators include some new series, discontinues some of those on the previous list,

and assigns timing classifications to some series formerly unclassified by timing. The method of preparing the new list, the reasons for adding or dropping series, and an explanation of the classification system are described in *Indicators of Business Expansions and Contractions*. (See reference 8, page 3.) The three major features of the new list are the classification of series by cyclical timing, the classification by economic process, and the short list of indicators.

TIMING CLASSIFICATION

Cyclical timing is the major principle of classification employed in the new list. Timing at both peaks and troughs is taken into account in grouping the series into leading, roughly coincident, and lagging indicators. These three groups are described as follows:

Leading Indicators—36 series that usually reach peaks or troughs before those in aggregate economic activity as measured by the roughly coincident series (see below). One group of these series pertains to orders and contracts, another to inventory investment, and so on.

Roughly Coincident Indicators—25 series that are direct measures of aggregate economic activity or move roughly together with it; for example, non-agricultural employment, industrial production, and retail sales.

Lagging Indicators—11 series, such as new plant and equipment expenditures and manufacturers' inventories, that usually reach turning points after they are reached in aggregate economic activity.

In addition, the new list contains a group of 15 series unclassified by cyclical timing. These are series

which have an important role in business cycles but do not display a consistent timing relation to them.

Also included in BCD, but not on the NBER list, are (1) a group of series which, although they measure significant economic relationships, remain unclassified by cyclical timing and economic process; and (2) indexes of industrial production, consumer prices, and stock prices for several countries which have important trade relations with the United States.

The historical business cycle turning dates used in this report are those designated by the NBER. They mark the approximate dates when, according to the NBER, aggregate economic activity reached its cyclical high or low levels. As a matter of general practice, neither new reference turning dates nor the shading for recessions will be entered in BCD until after both the new reference peak and the new reference trough bounding the shaded area have been designated. This policy is followed because of the conceptual and empirical difficulties of designating a current recession and the practical difficulties of terminating the shading for a current recession without including part of a new expansion. (See appendix A for historical peak and trough dates.)

ECONOMIC PROCESS CLASSIFICATION

A secondary principle of classification, economic process, supplements the timing classification. Series are cross-classified according to both principles. Eight major economic process categories are used: (I) Employment and Unemployment, 14 series; (II) Production, Income, Consumption, and Trade, 8 series; (III) Fixed Capital Investment, 14 series; (IV) Inventories and Inventory Investment, 9 series; (V) Prices, Costs, and Profits, 11 series; (VI) Money and Credit, 17 series; (VII) Foreign Trade and Payments, 6 series; and (VIII) Federal Government Activities, 8 series. Most of these major categories are subdivided into minor economic processes that exhibit rather distinct differences in cyclical timing.

SHORT LIST OF INDICATORS

A short, substantially unduplicated list of principal indicators provides a convenient way to summarize the current situation and outlook. Thus, a short list of 25 indicators, taken from the full list, has been designated by the NBER. This list includes 12 leading, seven roughly coincident, and six lagging indicators;

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CONCEPTS AND PROCEDURES

Several other concepts and procedures used in this report are summarized below:

Adjustments for average seasonal fluctuations are often necessary to bring out the underlying cyclical trends of a series. In most cases, the seasonally adjusted data used for a series are the official figures released by the source agency. In addition, 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. The *seasonal adjustment* process usually accounts for variations due to holidays; however, there are some cases in which a separate *holiday adjustment* is needed for holidays with variable dates.

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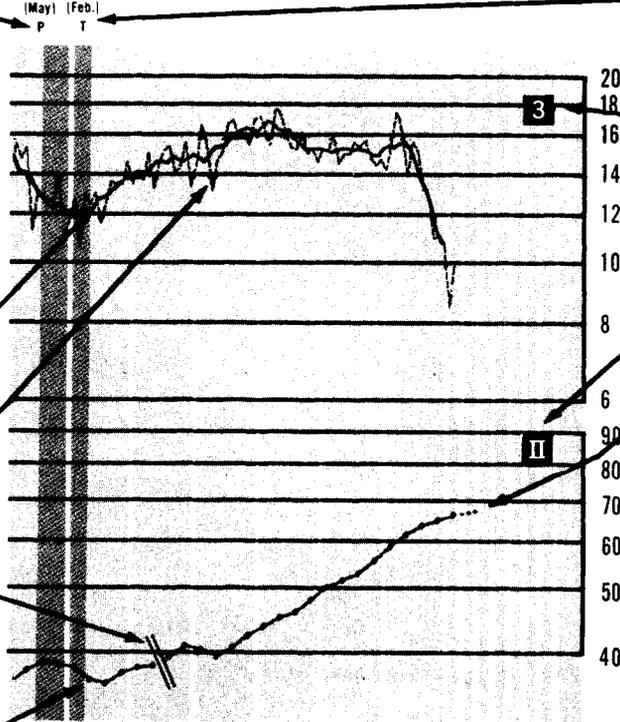
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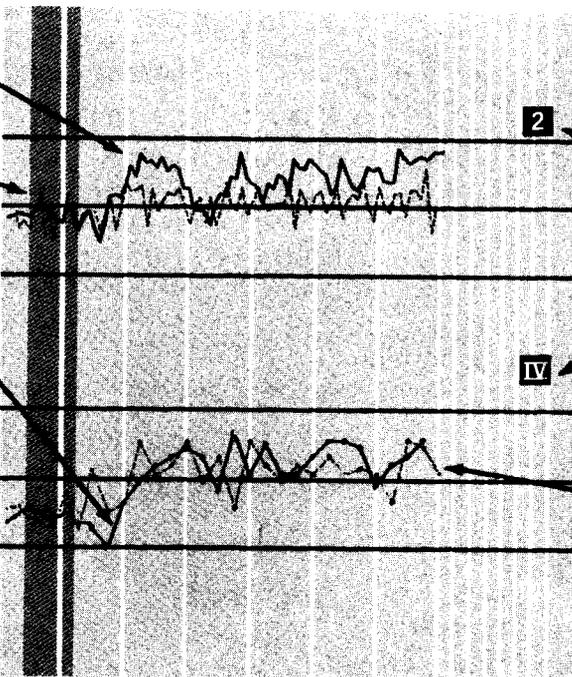
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Scale shows percent of components rising.

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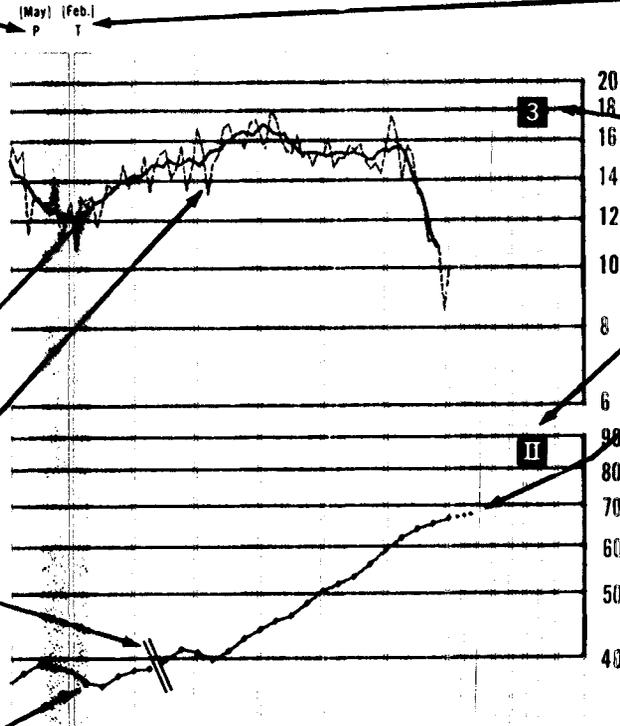
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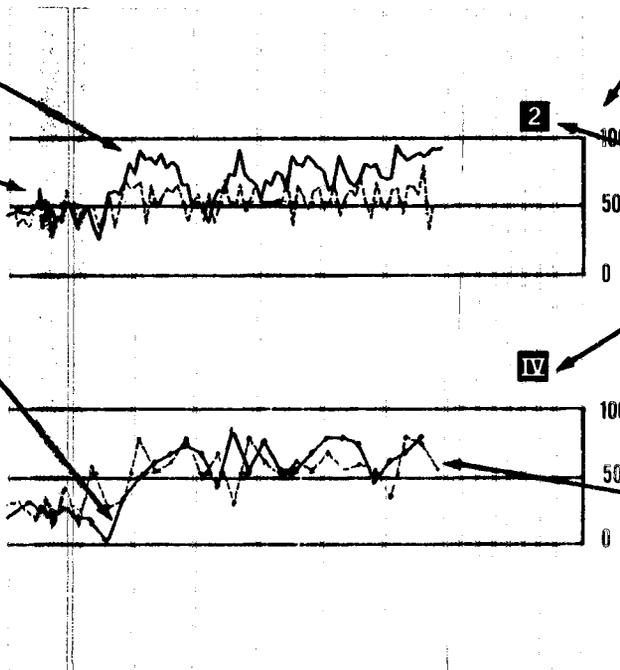
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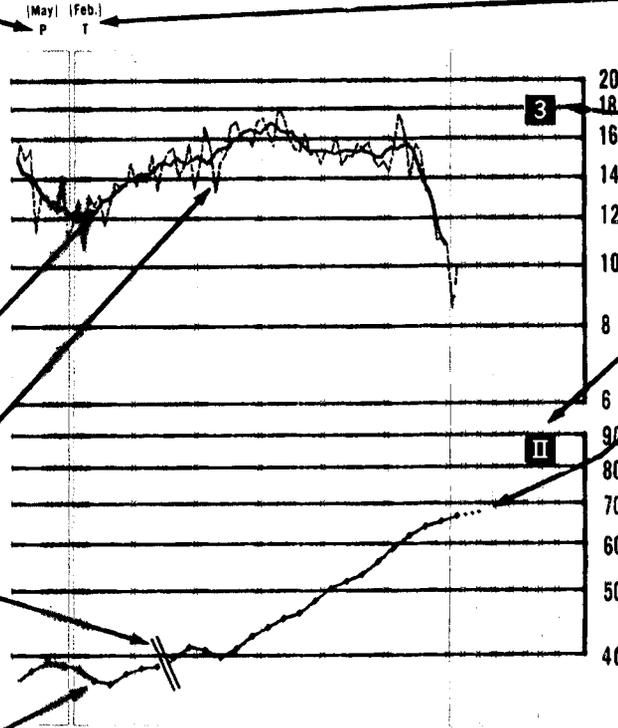
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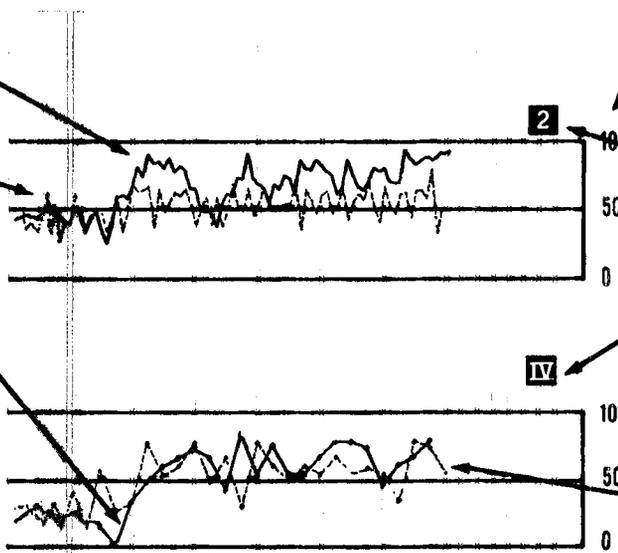
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HOW TO READ CHARTS

Peak (P) of cycle indicates end of expansion and beginning of Recession (shaded areas) as designated by NBER.

Series numbers are for identification only and do not reflect series relationships or order. Series are arranged in charts and tables according to their classification by timing and economic process.

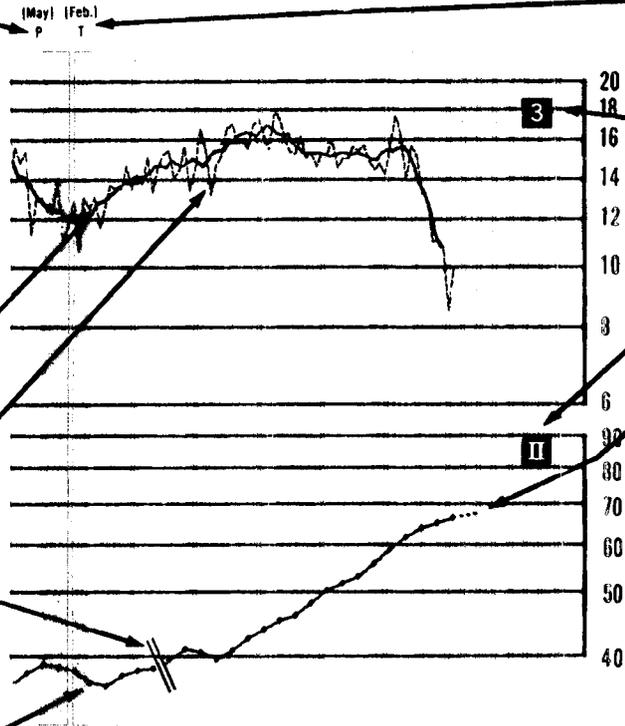
Solid line indicates monthly data. (Data may be actual monthly figures or MCD moving averages.*)

Broken line indicates actual monthly data for series where an MCD moving average* is plotted.

Parallel lines indicate a break in continuity (data not available, changes in series definitions, extreme values, etc.).

Solid line with plotting points indicates quarterly data.

CHART 1 - Series



Trough (T) of cycle indicates end of recession and beginning of Expansion as designated by NBER.

Arabic number indicates latest month for which data are plotted. ("3" = March)

Roman number indicates latest quarter for which data are plotted. ("II" = second quarter)

Dotted line indicates anticipated data.

Various scales are used to highlight the patterns of the individual series. "Scale A" is an arithmetic scale, "scale L-1" is a logarithmic scale with 1 cycle in a given distance. "scale L-2" is a logarithmic scale with 2 cycles in that distance, etc. The scales should be carefully noted because they show whether or not the plotted lines for various series are directly comparable.

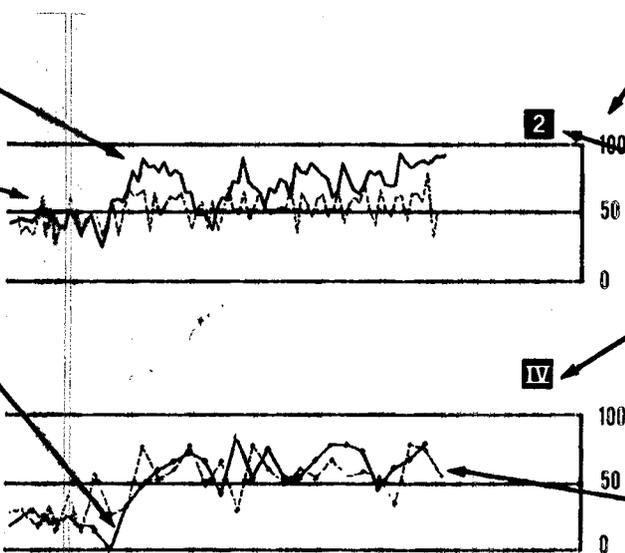
CHART 2 - Diffusion Indexes

Solid line indicates monthly data over 6- or 9-month spans.

Broken line indicates monthly data over 1-month spans.

Solid line with plotting points indicates quarterly data over various spans.

* Many of the more irregular series are shown in terms of their MCD moving averages as well as their actual monthly data. In such cases, the 4-, 5-, or 6-term moving averages are plotted 1½, 2, or 2½ months, respectively, behind the actual data. See appendix C for a description of MCD moving averages.



Scale shows percent of components rising.

Arabic number indicates latest month for which data are used in computing the indexes. ("2" = February)

Roman number indicates latest quarter for which data are used in computing the indexes. ("IV" = fourth quarter)

Broken line with plotting points indicates quarterly data over various intervals. This line is also used to indicate anticipated quarterly data.

HOW TO LOCATE A SERIES

To locate a series in **BCD**, consult the **Index—Series Finding Guide** in the back of the book where series are arranged into eight groups by economic process and cross referenced by timing classification in the first column. The back cover, which lists series titles (followed by a Roman numeral denoting economic process group) and sources in numerical order within each timing group, may also be helpful to some readers.

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CONCEPTS AND PROCEDURES

Several other concepts and procedures used in this report are summarized below:

Adjustments for average seasonal fluctuations are often necessary to bring out the underlying cyclical trends of a series. In most cases, the seasonally adjusted data used for a series are the official figures released by the source agency. In addition, 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. The *seasonal adjustment* process usually accounts for variations due to holidays; however, there are some cases in which a separate *holiday adjustment* is needed for holidays with variable dates.

Months for cyclical dominance (*MCD*) is an estimate of the appropriate span over which to observe the cyclical movements in a monthly series. *MCD moving averages* are shown in chart 1 for series with an *MCD* of "5" or more; however, to provide an indication of the variation about these moving averages, monthly data are also plotted.

Diffusion indexes are simple summary measures which express the percentage of the components of an aggregate series rising over given time spans. Their turning points tend to lead those of the aggregate. Series numbers preceded by "D" designate diffusion indexes. Many of the component series used to make up the diffusion indexes are shown in table 4.

During the current expansion, *high values* for the indicators are identified in table 2. These values are not necessarily cyclical peak values, but are simply the highest values reached to date.

Certain *appendix materials* are presented regularly in this report. These materials include historical data, adjustment factors, peak and trough dates, and other information helpful in interpreting trends in the indicators.

REFERENCES

More comprehensive explanations of the use of indicators of aggregate economic activity in analyzing current business conditions and prospects may be found in the following references:

- (1) Alexander, Sidney S. "Rate of Change Approaches to Forecasting—Diffusion Indexes and First Differences," *The Economic Journal*, June 1958, pp. 288-301.
- (2) Broida, Arthur L. "Diffusion Indexes," *American Statistician*, vol. IX, No. 2 (June 1955), pp. 7-16.
- (3) Burns, Arthur F. and Mitchell, Wesley C. *Measuring Business Cycles*. New York: National Bureau of Economic Research, Inc., 1946.
- (4) Daly, D. J. and White, D. A. "Economic Indicators in the 1960's," *Proceedings of the Business and Economics Statistics Section, American Statistical Association*, August 1966, pt. V, pp. 64-75.
- (5) Gordon, R. A. "Alternative Approaches to Forecasting: The Recent Work of the National Bureau," *The Review of Economics and Statistics*, vol. XLIV, No. 3 (August 1962), pp. 284-291.
- (6) Lempert, Leonard H. "Leading Indicators," *How Business Economists Forecast* (William F. Butler and Robert A. Kavesh, Ed.) pt. I, ch. 2, pp. 31-47. Englewood Cliffs, N.J.: Prentice-Hall, 1966.
- (7) Moore, Geoffrey H., Editor, *Business Cycle Indicators*. New York: National Bureau of Economic Research, Inc., 1961.
- (8) Moore, Geoffrey H. and Shiskin, Julius. *Indicators of Business Expansions and Contractions*, Occasional Paper 103. New York: National Bureau of Economic Research, Inc., 1967.
- (9) Morris, Frank E. "The Predictive Value of the National Bureau's Leading Indicators," *Business Cycle Indicators*, vol. I, ch. 4, pp. 110-119. New York: National Bureau of Economic Research, Inc., 1961.
- (10) Okun, Arthur M. "On the Appraisal of Cyclical Turning Point Predictors," *Journal of Business*, April 1960, pp. 101-120.
- (11) Shiskin, Julius. *Business Cycle Indicators: The Known and the Unknown*. Paper presented at the 34th session of the International Statistical Institute, Ottawa, Canada, August 24, 1963. Washington: Bureau of the Census, 1963.
- (12) Shiskin, Julius. *Signals of Recession and Recovery*, Occasional Paper 77. New York: National Bureau of Economic Research, Inc., 1961.

HOW TO READ CHARTS

Peak (P) of cycle indicates end of expansion and beginning of Recession (shaded areas) as designated by NBER.

Series numbers are for identification only and do not reflect series relationships or order. Series are arranged in charts and tables according to their classification by timing and economic process.

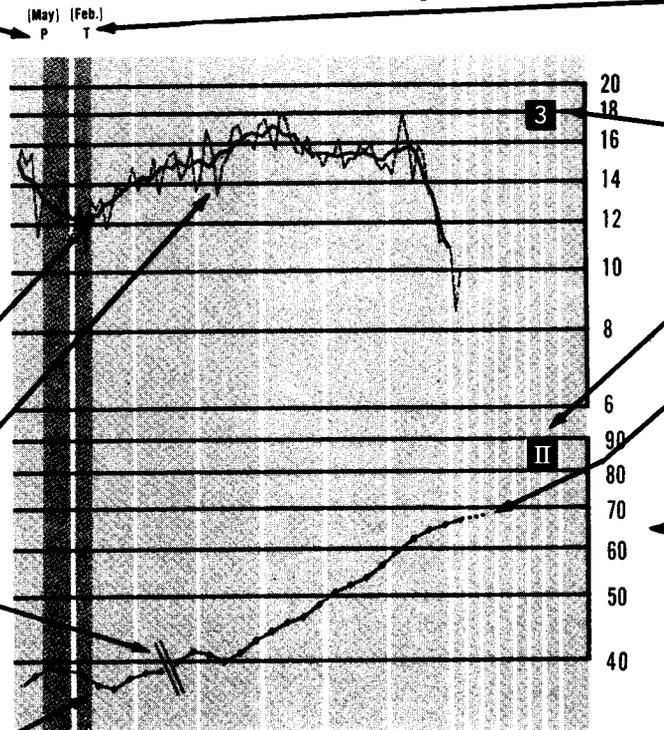
Solid line indicates monthly data. (Data may be actual monthly figures or MCD moving averages.*)

Broken line indicates actual monthly data for series where an MCD moving average* is plotted.

Parallel lines indicate a break in continuity (data not available, changes in series definitions, extreme values, etc.).

Solid line with plotting points indicates quarterly data.

CHART 1 – Business Cycle Series



Trough (T) of cycle indicates end of recession and beginning of Expansion as designated by NBER.

Arabic number indicates latest month for which data are plotted. ("3" = March)

Roman number indicates latest quarter for which data are plotted. ("II" = second quarter)

Dotted line indicates anticipated data.

Various scales are used to highlight the patterns of the individual series. "Scale A" is an arithmetic scale, "scale L-1" is a logarithmic scale with 1 cycle in a given distance, "scale L-2" is a logarithmic scale with 2 cycles in that distance, etc. The scales should be carefully noted because they show whether or not the plotted lines for various series are directly comparable.

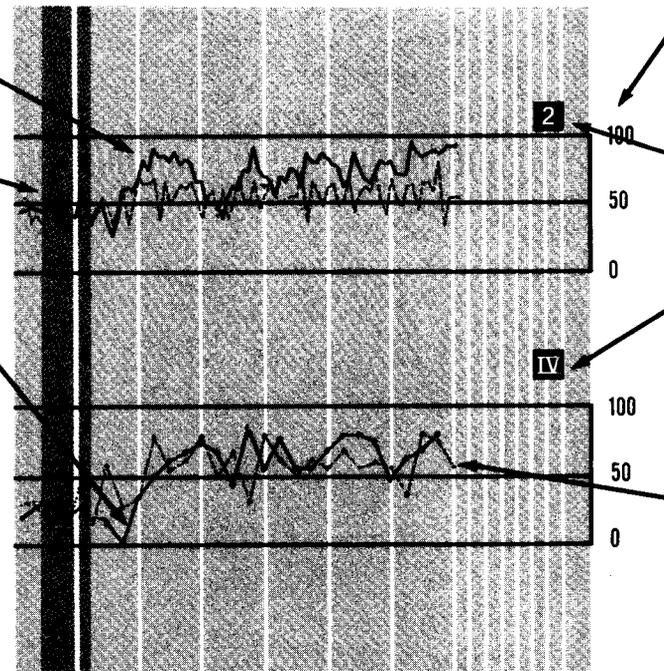
CHART 2 – Diffusion Indexes

Solid line indicates monthly data over 6- or 9-month spans.

Broken line indicates monthly data over 1-month spans.

Solid line with plotting points indicates quarterly data over various spans.

* Many of the more irregular series are shown in terms of their MCD moving averages as well as their actual monthly data. In such cases, the 4-, 5-, or 6-term moving averages are plotted 1½, 2, or 2½ months, respectively, behind the actual data. See appendix C for a description of MCD moving averages.



Scale shows percent of components rising.

Arabic number indicates latest month for which data are used in computing the indexes. ("2" = February)

Roman number indicates latest quarter for which data are used in computing the indexes. ("IV" = fourth quarter)

Broken line with plotting points indicates quarterly data over various intervals. This line is also used to indicate anticipated quarterly data.

HOW TO LOCATE A SERIES

To locate a series in **BCD**, consult the **Index—Series Finding Guide** in the back of the book where series are arranged into eight groups by economic process and cross referenced by timing classification in the first column. The back cover, which lists series titles (followed by a Roman numeral denoting economic process group) and sources in numerical order within each timing group, may also be helpful to some readers.