to us less promising than efforts to learn about the inter-
relations among the cyclical movements of different eco-
nomic processes. Towards this end the National Bureau of 
Economic Research has been making a detailed analysis of cyclical fluctuations as 
registered in time series covering many years in this 
country and Western Europe. If these efforts prosper, they 
should become a better guide than we have at present to 
the best methods of anticipating the future.

To sum up: Table 2 demonstrates that the cyclical up-
turns in a considerable number of American time series have been distributed consistently fairly evenly around the months 
that we have selected as reference dates for revival. Cer-
tain series have had most or all of the dates with which 
comparisons can be made; but they have been led by intervals 
that have varied from one instance to the next. Because 
of these variations, we cannot trust the indications of any 
single series concerning the month which will later be 
chosen as the reference date around which the revival cen-
ters. I am formulating judgments about the future date 
with care to follow the current movements of a collection of 
series representing different types of economic activity and 
selecting the month of the relative regularity with which they have turned upward in earlier 
revivals.

The chief hazard in forming judgments from such a collection is that cyclical movements may end up in a 'double bottom'. Several of the depressions of which we have fair statistical knowledge show two troughs about 
equally low separated by a mild upturn. The behavior of 
general business in 1932-33 is a notable example. Business 
reached a trough about July 1932, experienced a substan-
tial upturn in the autumn, a relapse in the winter, and a 
new low point in March 1933. A large proportion of the 
makes for a March-May cycle of business conditions partici-
pated in the abortive upturn of the autumn of 1932 and in 
the relapse that followed. (footnote18 concluded)

The cause of cyclical upturns and downswings before correspon-
ding reference dates for revivals and recessions. But the data on 
longer business in 1932-33 is not the most important prac-
tical problem is to extend the scope of such data and to supple-
ment them with data on cancellations. A person who attempted 
without a better understanding of the situation to give careful atten-
tion to the rate of growth of the industries covered. If he found, 
for example, that cutbacks are excessively numerous in his 
field, he would probably find it desirable to assign a 
weight to them smaller than is suggested by their gross or net 
output. The large erratic fluctuations found in most series on 
orders are another source of difficulty; it may prove desirable to 
add up the movement in assigning weights, series with 
relatively mild erratic fluctuations receiving increased 
weights and series with exceptionally violent erratic fluctuations 
receiving reduced weights. It is not worth while to carry speci-
fication very far at this time. But it should be noticed that a good 
index of orders is likely to prove a better forecaster of business-
ecyclic recessions than of business-cyclic revivals.

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So far as we know, there is no certain way of telling at 
the time it begins whether an insipient revival will suffer a 
relapse or develop into a cyclical expansion. Yet the occa-
sions are frequent when speculation about the future course 
of business is demanded by pressing present needs. Those 
whose hard duty it is to make these guesses have the 
best chance of being substantially right if they combine an 
understanding of current business data with some knowledge of the his-
tory of business cycles, such information as is available 
concerning important factors arising outside the realm of 
business, and a firm determination not to let their hopes 
and fears color their judgments more than is inevitable.

Henry S. Daman, one of the Directors of the National Bureau 
who knows the novelty and the difficulty of business forecasting 
from long experience, points out the close analogy between 
the problems of an executive confronting a cyclical contraction and 
a physician treating an illness.

'Thousands of business men,' Mr. Daman says, 'are 
taking and must take steps based upon their diagnoses of 
the situation. Sometimes they are justified; sometimes they 
are mistaken; they must act. No two cycles are alike—neither 
are any two cases of typhoid. The doctor is helped if he knows 
the "generality" of cases and all the tools (though all imperfect) 
indicators, yet he must weigh and adjust his case in hand as 
unique, for the business economist and the business manager.

The doctor even today must face the causes and exact 
form of the malady of which he is so often ignorant or unin-
certain or impossible; sometimes years ago this was true in most of 
his cases; progress has been made because it had to be made.'

Announcement

'THE SCIENTIFIC SOCIETY AND THE UNKOWN FUTURE'

In response to numerous requests the National Bureau has 
reprinted the introductory chapter of Frederick R. Macau-
ly's Some Theoretical Problems suggested by the Move-
ments of Interest Rates, Bond Yields and Stock Prices in 
the United States since 1855 (386 pp., 33 tables, 32 charts, 
$5). It believes that many readers of 'The Social Sciences 
and the Unknown Future' will wish to see how Dr. 
Macaulay solves the problems he sets before. A charming 
refutation that Chesteron gives a partial clue to the na-
ture of these solutions; the table of contents indicates the 
field covered by the analysis; Dr. Mitchell's Fireace 
warns against accepting the data intended to illustrate the 
notion that the particular problems presented later in 
the book.

Subscribers wishing to do the National Bureau a good 
turn can stimulate their friends' interest in its work by 
sending them copies of this booklet. The National Bureau 
will attend to mailing for its subscribers (at 25 cents a 
copy, post-paid) to all lists of 10 or more. Single copies 
cost 35 cents.

NATIONAL BUREAU OF ECONOMIC RESEARCH BULLETIN—Annual Subscription (Five Issues), $1.00

Single copies, this issue, twenty-five cents

National Bureau of Economic Research

1940 BROADWAY, NEW YORK

BULLETIN 69

WESLEY C. MITCHELL AND ARTHUR F. BURNS

WESLEY C. MITCHELL AND ARTHUR F. BURNS

1. THE AIMS OF THIS BULLETIN

This bulletin rests upon an analysis of the timing of 
cyclical revivals in the United States of 487 statistical 
series in monthly or quarterly form, of which many cover 
the post-War period alone, while a few run back to the 
1890's or earlier. What we have to offer is a digest of past 
experience, which we take to be on the whole the best 
technique of what to expect in the near future.

But one of the clearest teachings of experience is that 
every business cycle has features that are peculiar to it. 
Accordingly, no one should look at the past expects that 
what happened during any earlier business revival will re-
peat itself exactly during the next revival. Even average 
experience over several revivals establishes no more than 
a presumption concerning the general character of the de-
velopments that may be anticipated when next the business 
tide begins to rise. Whatever judgments are formed ought 
to be based, not upon the behavior of one or two or 
two indices of business conditions, but upon the behavior of a consider-
able number of statistical series that represent a wide variety 
of economic processes, and upon a careful study of the salient 
factors that are influencing current business policies.

Hence we have drawn up a list of statistical series differ-
ing widely in other respects, which in that each has 
proved in the past to be a fairly consistent indicator of 
cyclical movements in general business. We regard this 
list not as a 'forecasting' machine, but rather as a registering 
device that may be useful to those who are trying to in-
vestigate the months around which the cyclical revivals and recessions 
in individual series centered. To that end we compare the 
timing of the cyclical turns in individual series with our 
tentative dates of the peaks and troughs of business cycles, 
and then revise these tentative dates in whatever way the 
first results suggest. Some leaders lead with considerable 
regularity the turning dates that we accept for business 
cycles; for fuller explanations of the National Bureau's methods 
of measuring cyclical behavior, see Bulletin 57.
National Bureau of Economic Research

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cyclical turns in each series with the corresponding refer-
cence dates in Table I. Of course the reference dates are
subject to error, particularly in the earlier decades, for
which few monthly series are available. Also the cyclical
turns which the current cycle reached its peak, though we sup-
pose that this date was late in 1936 or in the spring of
1937.

The leads and lags of individual series at revivals or
recessions are determined by comparing the dates of the series
with our reference dates. This process results in a bias in our
timing measurements of individual series in the sense that
leads are more numerous than lags.

Any error that we may make in deciding the reference dates affects the absolute magnitude of the timing measures, but it is in no way affects the sequence in time of the cyclical turns that occur in indi-
vidual series during a business cycle revival or recession. Also
the average sequence of individual series is unaffected by errors in
our reference dates. Our results will not be affected by the
error in our reference dates if the average sequence of
individual series is unaffected by the error.

In deciding reference dates of business cycles we have
found that the peaks are often 'reassessed' or that the peaks are
doubly or triple peaks. Our general rule in cases of double
peaks is to take the later date as marking the cyclical turn. Of
course, this procedure results in a bias in our timing
measurements of individual series in the sense that leads are
more numerous than lags.

A puzzling question is raised in three or four other instances when mechanical matching of specific-cycle troughs
with reference troughs, but they do not occur frequently in the group of series presented in this bulletin. When other
two specific-cycle troughs may be related to a reference trough, our general rule is to choose that specific-cycle trough which deviates from the reference
trough by a smaller percentage of the duration of the refer-
ence phase within which it falls. This mechanical rule at
times gives obviously false results, and we have not used it in
those few instances where that happened.

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trough by a smaller percentage of the duration of the refer-
ence phase within which it falls. This mechanical rule at
times gives obviously false results, and we have not used it in
those few instances where that happened.

III. CRITERIA FOR SELECTING TRUSTWORTHY STATISTICAL
INDICATORS OF CYCICAL REVIVALS AND RECESSIONS

An ideal statistical indicator of cyclical revivals and rec-
cessions would have the following characteristics:

1) It would cover half a century or longer, thus showing its
relation to business cycles under a variety of con-
ditions.

2) It would lead the month around which cyclical revival
centered, thus allowing for an involuntary include-
ment of a period better, six months. It would also lead the central month of
every cyclical recession by an involuntary interval,
which might differ from that lead of a revival.

3) It would show no erratic movements; that is, it would
swing smoothly up from each cyclical trough to the
next cyclical peak and then swing smoothly down to
the next trough, so that every change in direction would
be but one production of a cyclical revival or recession.

4) Its cyclical movements would be pronounced enough to
be readily recognized, and give some indication of the
relative amplitude of the coming change.

5) It would be so related to general business activity as to
establish as much confidence as the nature of such things
allows that its future behavior in regard to business
cycles will be like its past behavior.

Even if we could fix the central month of every revival
and recession with assurance, we could find no series that
possesses all these characteristics. What we have done is
to accept our reference dates as fair working approxi-
mations to three central months, and then to select
those series that approach the 'ideal' statistical indicator
most closely. Most of the series are shorter than we
like; the intervals of the leads or lags always vary appreci-
ablely from cycle to cycle, and the series that usually
lead at revivals or recessions lag occasionally; all
show some erratic movements, so that an upturn during a
cyclical contraction may not mean that a general revival
is 'just around the corner', and a downturn during expan-
sion may not mean that a general recession is imminent;
the relation of the series that we have selected to general
business activity is such as to establish a presumption of
their diagnostic, and perhaps in some measure of their
prognostic, value; but we can never be sure that unusual
conditions may not make any series behave in an un-
predictable manner, even at an expansion.

It is because of the past shortcomings of the most trust-
worthly indicators we have been able to find that we think it
is unsafe to base judgments of current conditions upon the
behavior of any one series, or of a few series. The likeli-
hood of being misled is reduced, though not eliminated; if
one uses a considerable number of series, each with a good
past record as an indicator, and representing in the aggre-
gate a wide range of business activities.

Table 1

<table>
<thead>
<tr>
<th>Reference Dates and Durations of Business Cycles</th>
<th>United States, 1851-1935</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expansion</td>
<td>Contraction</td>
</tr>
<tr>
<td>December</td>
<td>May</td>
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<tr>
<td>1853-55</td>
<td>1856-57</td>
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<td>1855-56</td>
<td>1857-58</td>
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<td>1925-26</td>
<td>1927-28</td>
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<tr>
<td>1927-28</td>
<td>1929-30</td>
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<tr>
<td>Average duration, 20 cycles</td>
<td>22</td>
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</tbody>
</table>
IV. STATISTICAL SERIES THAT HAVE BEEN RELATIVELY CONSISTENT INDICATORS OF BUSINESS-CYCLE REVOLVES

From the 487 American monthly or quarterly series analyzed, 62 have been selected each year that have been reliably consistent in their timing in relation to business-cycle revivals and that at the same time are of sufficiently general interest to warrant some attention by students of current economic conditions. Most of these series are fairly good indicators also of cyclical recessions; but we confine this bulletin to indicators of cyclical revivals.

The series listed in Table 2 in the order of the average timing of their cyclical upturns, beginning with the series that lead the procession of revival by the longest average intervals and ending with the series that lag farthest behind. These averages are based upon whatever periods the series numbered on lines 63 to 68, and 71 to 75 have lagged at two-thirds or more of the reference revivals that occurred within the periods covered by the data. The series numbered on lines 63 to 68, and 71 to 75 have lagged at two-thirds or more of the reference revivals that occurred within the periods covered.8 Series that have made their cyclical upturns within three months of the reference dates for revivals in two-thirds or more of the instances are also included; for these series have considerable consistency in cyclical timing, whether they alternate between leading and coincident cycles at nearly the same periods upward shortly before or shortly after the reference dates.8 To facilitate the reading of Table 2 we explain the captions and symbols column by column.

Column 3, 'Period covered by specific cycles,' gives the date of the initial trough of the first specific cycle that we recognize in the series and the date of the terminal trough of the cycle with which our analysis closes. By specific cycles we mean movements in an individual series, as distinguished from business cycles, which are the whole conjures of cyclical movements in most of the economic areas. These two kinds of cycles have approximately the same periods. The entries in columns 4 and 5 are the same in about two-thirds of the series. In a few series this identity is fortuitous; one specific cycle may stretch over the period covered at another time two specific cycles may occur within the period occupied by one business cycle. Those series which show a one-to-one correspondence apply to each segment of the series taken by itself, not to the series as a whole.

Column 13 and 14 report upon the erratic movements to which each series is subject. Erratic movements are those that show the number of months that the recorisons of specific cycles lead or lag at reference revivals; the entry in column 15 shows the average fall of the specific cycles, not the rise; and the entry in column 16 shows the average rise, not the fall.9 A series that usually makes its cyclical turns near the middle of reference expansions and near the middle of reference contractions can be treated as having either a positive or an inverted relation to business cycles. Three series on bond yields appear at the bottom of Table 2 because they have exceptionally long lags at reference revivals. But when a process reacts fairly consistently to business cycles, long lags of its specific-cycle revivals at reference revivals must mean that its specific-cycle recorisons lead the reference revivals by substantial intervals. Hence the timing of bond yields is shown in Table 2 on an inverted as well as on a positive basis. For a similar reason a double set of entries is made for bond sales on the New York Stock Exchange.9

A LIST OF THE MOST TRUSTWORTHY INDICATORS OF BUSINESS-CYCLE REVOLVES

Critical examination of Table 2 shows the respects in which and the degrees to which the different series fall short of the requirements of an ideal indicator of business conditions that were set forth above. No doubt each of the 71 series may make a contribution to judgments about the occurrence of a cyclical revival. But some are more trustworthy indicators than others, and we consider only the most trustworthy for consideration on that ground. If we can determine which these series are we shall have a much shorter list—and the brevity will be an advantage, provided that it is not gained by reducing overmuch the variety of activities represented.

We have considered the following factors in making this final selection from our materials: Other things equal, a series is more useful as an early indicator of revivals in general business

1. The longer its average lead at past revivals

2. The more uniform these leads are in occurrence and magnitude

3. The closer its specific cycles come to having a one-to-one correspondence to business cycles

4. The more clearly defined its specific cycles

The amplitudes of the series that are analyzed inversely are computed from the amplitudes of the reference cycles, that is, they are expressed as percentages of the average value of a series from the peak of one specific cycle to the peak of the next specific cycle.
### Table 3: Timing of 71 Series at Business-Cycle Peaks in the United States: Three Event-Moments and Their Cyclical Amplitudes

<table>
<thead>
<tr>
<th>Line and number</th>
<th>Period by dollar ($)</th>
<th>No. of peaks</th>
<th>Number of decays</th>
<th>Average length</th>
<th>Average amplitude</th>
<th>Range of peaks</th>
<th>Number of series in which data are available</th>
<th>Amplitude</th>
<th>Amplitude of specific cycle</th>
<th>Amplitude of general cycle</th>
<th>Amplitude of specific cycle as % of general cycle</th>
</tr>
</thead>
</table>
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5) The less intense its erratic movements in comparison with the amplitude of its specific cycles
6) The fewer the changes in the direction of its month-to-month movements
7) The smaller and more regular the seasonal variations that have to be ‘elimated’ before the specific cycles can be studied
8) The larger the number of past revivals covered by the series.

The farther back in time any irregularities in conformity to business-cycle revivals occurred

The broader the range of activities represented by the series.

The more stable the economic significance of the period represented.

But other things never are equal. When a series ranks high as judged by one or two of these criteria, it ranks lower as judged by others. Hence we have drawn up an annotated list of the series that we consider to be the most trustworthy indicators of revivals. We include series that may have some prognostic value on account of their long average leads, and also series that have short average leads or no leads, but that show notably narrow ranges in their cyclical timing and therefore have confirmatory value concerning the occurrence of a general business revival. The annotations show both the respects in which the series merit high rank and their shortcomings. We state also the line in Table 2 on which each series may be found and the source in which it is currently reported.

TOTAL LIABILITIES OF BUSINESS FAILURES (Line 5)
Average lead 9 months. A long series that moves inversely. Our analysis covers 12 business cycles, but 14 rev.
20. Thirteen leads, one lag. Range of timing, 17 to 6 months. Leads consistently long, shortest being 6 months and longest 11 months. Failed during War and single cycle out of 9 months. April 1901. Erratic movements are pronounced and changes in direction frequent; but in neighborhood of cyclical revivals the erratic movements are moderate. Seasonal large but tolerable yearly. These remarks are based upon Heat-

STOCK PRODUCTION (Line 22)
Average lead 4 months. No lags or coincidences. Covers 5 cycles. Timing range narrow, -3 to +1. Shows an extra specific cycle, but it is of slight amplitude and occur-

TEN-MILES OF FREIGHT RATED (Line 23)
Average lead 4 months. No lags or coincidences. One to-

STEEL-SHEET PRODUCTION (Line 28)
Average lead 3 months. Record shorter than pig iron (9 cycles compared with 15). One-to-one correspondence. One lag, one coincidence. Range -4 to +6. Erratic moves somewhat more intense, changes in direction more frequent and seasonality larger, than in pig iron. Chief advan-

INDUSTRIAL BUILDING CONTRACTS, FLOOR SPACE (Line 43)
Average lead 3 months. No lags, one coincidence. One-to-

PASSENGER CAR PRODUCTION (Line 11)
Average lead 6 months. No lags or coincidences. Covers only 5 cycles but they bear a one-to-one correspondence to business cycles. Leads range from 1 to 14 months; they are smaller in the last three than in the first three revivals. Reversals of direction relatively infrequent; but erratic movements moderate, and seasonal large and unstable. Source: Bureau of the Census, Automobiles.

INNER TUBE PRODUCTION (Line 12)
Average lead 6 months. No lags, one coincidence. One-to-

INDEX OF WHOLESALE PRICES, BRAHMTON'S (Line 30)
Average lead 4 months. Nine leads, one lag. Range of timing, -12 to +5. Covers 8 cycles, maintaining one-to-

TANK CAR PRODUCTION (Line 22)
Average lead 4 months. No lags or coincidences. Covers 5 cycles. Timing range narrow, -3 to +1. Shows an extra specific cycle, but it was of slight amplitude and oc-

TRACTION RAILWAY (Line 37)
Average lead 3 months. Covers 15 cycles, maintaining one-
to-one correspondence throughout. One lag, three coinci-

STEEL-SHEET PRODUCTION (Line 38)
Average lead 3 months. Record shorter than pig iron (9 cycles compared with 15). One-to-one correspondence. One lag, one coincidence. Range -4 to +6. Erratic moves somewhat more intense, changes in direction more frequent and seasonality larger, than in pig iron. Chief ad-

INDEX OF BUSINESS ACTIVITY, AMERICAN TELEPHONE AND TELEGRAPH COMPANY (Line 53)
Average lead 2 months. Covers 15 cycles, maintaining one-
to-one correspondence. Eight leads, one lag, seven coinci-

INDEX OF PRODUCTION, STANDARD STATISTICS COMPANY (Line 55)
Average lead 1 month. Two leads, one lag, two coinci-

DEPARTMENT STORE SALES (Line 56)
Average lead 1 month. Two leads, one lag, two coinci-

FACTORY EMPLOYMENT, TOTAL (Line 60)
Average lead 3 months. Two leads, two lags, nine coinci-
dences. One-to-one correspondence. Timing range -6 to +4. One-to-one correspondence. A reliable indicator since 1919, the period to which our analysis is confined. Erratic movements mild. Changes in direction exceptionally infrequent. One of the most consistent indi-
cators of revivals. Chief limitation is that the record covers only 5 cycles. Source: Federal Reserve Bulletin.

OTHER EMPLOYMENT SERIES
Several other employment or payroll series in Table 2 are almost or quite as consistent in their cyclical timing as the series on total factory employment, but they cover 4 cycles
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Instead of 5. The timing of factory employment in the machinery group (line 65) has been slightly more consistent than that of total employment. Reversals of direction in machinery employment are even less frequent than in total employment. Source: Federal Reserve Bulletin.

We regard the series listed in this section as the most trustworthy indicators of cyclical revivals that our present study of past cycles has established; we must stress the difficulties that will be encountered and the precautions that should be observed in forming judgments about current conditions from our list.

VI. CAUTIONS NECESSARY IN JUDGING CYCLICAL REVIVALS

A person who attempts to determine by studying the series we have listed whether or not any trustworthy indicators of a cyclical revival exist at a given time will find that he must equip himself with a great deal of additional information before he can form a considered judgment.

The first obstacle he will encounter is that monthly statistical records are never up to date. The monthly series may tell him what the status of business was a month or two ago; they cannot tell him what the status of business is today. The only way to meet the obstacle of tardy monthly reports is to use weekly or daily figures when available. Although data by such short time units are likely to be subject to greater fluctuations in their cyclical turns, they make it possible to estimate the standing of individual series in the current month.

A second difficulty arises in treating seasonal components. When seasonal variations change from year to year, the problem of making satisfactory adjustments for current months is hard to solve. The shift in the seasonal pattern of automobile production since the fall of 1933 is merely an extreme instance of a common difficulty. The larger the seasonal variations in a series relatively to the amplitude of its specific cycles, the more serious will be the results of an erroneous seasonal adjustment. A poor seasonal adjustment may produce an upward that is readily misinterpreted as cyclical or may cancel for a month or more a genuine cyclical upturn. We know no protection against this danger more reliable than a careful comparison of the original and seasonally-adjusted data, plotted on the same chart.

When even a series is free of seasonal variations, it is difficult to recognize a cyclical turn at the time it actually occurs. Even if, however, if not consistently, some months before a reference turn for revivals seems to have high prognostic value, but the chance is fair of having a purely historical value. The reason is that the cyclical movements of economic series are diversified by erratic fluctuations. Table 2 demonstrates that most series typically keep the same direction only two or three months. Once a cyclical decline is well advanced, there is no way of deciding at the time a rise occurs in monthly data whether the rise will prove to be a minor interruption of the downward movement or the beginning of a cyclical expansion. Mechanical smoothing cannot cope with this problem. It is better to analyze the available data closely than to trust mechanical devices to tell whether a given change in the specific activity is a cyclical expansion or a cyclical movement. For example, "aggregate" building permits rose very sharply in the spring of 1929. But that rise was due entirely to the rush by New York City builders to plan in advance for apartment houses and hotels in time to escape limitations on height and other restrictions of the Multiple Dwelling Act about to be enacted. When New York City is eliminated from the figures, the sharp rise is replaced by a sizable decline. It is often possible thus to break down a statistical series into several component parts, and through study of the parts to arrive at a considered opinion concerning the nature of the movement, rather than the series as a whole. And it is desirable to supplement such intensive tests by extensive tests. We think that it is wise to test judgments based upon our short list of series by seeing whether they are confirmed by the longer list in Table 2. Also there probably are good business indicators among the series carried by the Survey of Current Business and other publications but not included among the 487 series that we have analyzed. The lost series may analyze factors which do not enter into the shorter series.

Another difficulty is that no sequence of average leads of time series in past cyclical revivals can tell what the exact sequence will be at the next revival. The measures of dispersion in Table 2 show that the cyclical behavior of most of the economic series is of a highly irregular type at times and differences in behavior are attended irregularly; at others they reflect secular or structural changes. Business failures lag six months at the cyclical upturn in 1901, although they lead reference for down turning in 1929. Business cycles upturn after passenger car production at the revivals of 1914 and 1919; at the next three to five years after the revival incidentally, while at the revival of 1933 trucks turned up before passenger cars. The cyclical behavior of money markets has changed so profoundly in recent years that a breakdown of records does not serve to be valuable guide to the near future. We recognize this fact in Table 2 by stopping the comparison of like cyclical turns of interest rates and general business in 1929.\footnote{If we tried to compare like cyclical turns after 1927, we should have to relate the trough of bond yields in January 1957 with the trough of the New York stock market index in the late 1950's.}

To cite another example, if a study like the present one were made three years ago, we should find that various cyclical series had diversified in their cyclical turns and that the comparison of opposite cyclical turns could be extended from 1931 to 1934; that the unexpected peak in bond yields in June 1932 may be compared with the reference trough of March 1933. This makes us come in Table 2, chapterly to preserve objectivity.

It would have been impossible to include automobile production, but it surely would have been desirable to include rail traffic, although the results of early stage in a major cycle may not be in a more compact list, since the erratic fluctuations in railroad purchases have always been exceptionally violent. Today we must exclude railroad purchases, for their tendency to be an inverted mirror of a statistical series is disappointing. Such changes in cyclical timing are full of instruction to the student of business cycles. They are important also to the person who makes forecasts. In making, exchanging simple formulas, test his judgments by study of numerous statistical series, and stand ready to revise his list of indicators as the economic environment changes.

In Table 2 we indicated only those phases of behavior with respect to business-cycle revivals that can be easily measured, or graded on the basis of measurements. One who wishes to form reasoned judgments about current business trends may make his interpretation of the data much fuller than we have carried ours in this bulletin. He should plot on large charts the original and seasonally-adjusted data for every series that appears from our preliminary sorting to have prognostic or diagnostic value, preferably using not only the series included in our compact list but all or most series in Table 2. Then he should scrutinize with care the movements of each series during the later stages of the current cycle and, because earlier changes of past for other reasons. Of course the probable value of short series must be judged by criteria other than consistency of performance.

An obvious suggestion for reducing the labor and the uncertainties attaching to the use of a list of series such as ours is to group it in the "business barometers" into an index number. Whether an index can be made that will be both a prompter and a more trustworthy indicator of business-cycle revivals than any series available at present, we do not know. Five indexes of "business activity" are included in Table 2, of which only one is admitted to our brief list, and that index has average leads of only two months. Of course these business indexes were not made for the specific purpose of forecasting revivals.

A compiler who set himself this task doubtless could put together an index that turned upward several months before each of our reference dates since the War. But an index made on this strictly empirical basis would have to demonstrate its trustworthiness over several future cycles before it could command much confidence.\footnote{Statistical methods of trying to improve prognostic series seem to be in the experimental stage as yet. The index of industrial "output," is perhaps the most promising thing that might be done along these lines is to start with the hypothesis that the new orders received today will be the orders shipped tomorrow, and that a forecasting index might therefore be made by compounding changes in orders in many lines of business, including also contracts for construction. In analyzing time series we have found the rough rule to hold, that orders for commodities and construction constru}