THE CONFERENCE BOARD

Business Cycle Indicators Handbook

The Conference Board creates and disseminates knowledge about management and the marketplace to help businesses strengthen their performance and better serve society. As a global, independent, public-purpose membership organization, we conduct research, bring executives together to learn from one another, convene conferences, publish information and analyses, make forecasts, and assess trends.

The Conference Board's Business Cycle Indicators Program

As part of a long-term strategic plan to redeploy its resources and improve the U.S. national accounts, the Bureau of Economic Analysis of the U.S. Department of Commerce selected The Conference Board in 1995 to be the new custodian of the official composite leading, coincident, and lagging indexes. The first independent release of the composite leading index by The Conference Board was on January 17, 1996.

The official U.S. composite indexes are an important component of The Conference Board's Business Cycle Indicators program which is devoted to the timely release of cyclical indicator information, and is an important tool for monitoring the business cycle. The Board's work in this regard also includes the Business Cycle Indicators database, which includes the composite indexes as well as more than 250 other economic series, and a monthly publication, *Business Cycle Indicators*. (The first issue of *Business Cycle Indicators* was published in February 1996.)

This publication, *Business Cycle Indicators Handbook*, describes in detail the series in the BCI report and database, and includes articles discussing the value and use of the cyclical indicator approach. Also included are articles describing the composite index methodology and major revisions to the leading index, unveiled by The Conference Board in December 1996, and January 2001.

Subscription Information

The news release for "Leading Economic Indicators and Related Composite Indexes" carries the composite leading, coincident and lagging indexes, and is available by fax or mail. This release is also available at no charge to the public on www.tcb-indicators.org.

Annual subscriptions to *Business Cycle Indicators*, published monthly, include tables and charts for the more than 250 economic series described in this Handbook. In addition, the entire BCI database is available in electronic spreadsheet form on the Internet at www.tcb-indicators.org. See details on educational site license options at www.tcb-indicators.org/subscriptions.htm.

For further information, on the U.S. Indicators program as well as The Conference Board's new Global Indicators program, please call the Economics program at 212 339 0312 or e-mail lei@conference-board.org

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Acronyms

AR	•	Annualized Rate
ATS	•	Automatic Transfer System
BCI	•	Business Cycle Indicator
BEA	•	Bureau of Economic Analysis
BLS	•	Bureau of Labor Statistics
CCAdj	•	Capital Consumption Adjustment
CES	•	Current Employment Statistics
CIA	•	Central Intelligence Agency
CPI	•	Consumer Price Index
CPI-U	•	Consumer Price Index, Urban Consumers
CPI-W	•	Consumer Price Index, Wage Earners and Clerical Workers
CPS	•	Current Population Survey
CRB	•	Commodity Research Bureau
D&B	•	Dun & Bradstreet
DIA	•	Defense Intelligence Agency
DOL	•	Department of Labor
DTC	•	The Depository Trust Company
ETA	•	Employment and Training Administration
FHA	•	Federal Housing Administration
FRB	•	Federal Reserve Board
GDP	•	Gross Domestic Product
GNP	•	Gross National Product
HUD	•	Housing and Urban Development
IPD	•	Implicit Price Deflator
IPI	•	Industrial Production Index
IRA	•	Individual Retirement Account
ITA	•	International Trade Administration
IVA	•	Inventory Valuation Adjustment
LEI	•	Leading Economic Indicators
LIFO	•	Last-In-First-Out
NAPM	•	National Association of Purchasing Managers
NFO	•	National Family Opinion
NIMA	•	National Imagery and Mapping Agency
NIPA	•	National Income and Product Accounts
NOW	•	Negotiable Order of Withdrawal
NSA	•	National Security Agency
NSA	•	Not Seasonally Adjusted
OCD	•	Other Checkable Deposits
PCE	•	Personal Consumption Expenditures
PMI	•	Purchasing Managers' Index
PPI	•	Producer Price Index
S&P	•	Standard & Poor’s
SA	•	Seasonally Adjusted
SAAR	•	Seasonally Adjusted Annual Rate
SIC	•	Standard Industrial Classification
TCB	•	The Conference Board
UM	•	The University of Michigan
WALD	•	Wages Accurals Less Disbursement

Foreword

There are many persons from both government and the private sector without whom this Handbook would not have been possible. Their names are listed throughout this publication, and author's of specific articles appear in the third and fifth sections.

Special thanks go to Chairperson Janet Norwood and members of the BCI Advisory panel for their support and advice.

At The Conference Board, Michael Fort, Manager of the Business Cycle Indicators Program, was in charge of the project. Matthew Cottell, who oversaw the production of the U.S. cyclical indicators at The Conference Board until April 2000, contributed extensively to compiling and writing the material, as did Anne Picker of Picker Associates. Ataman Ozyildirim (Economist), Jacinto Torres (BCI Research Analyst), Jennie Kim (BCI Product Analyst) also made substantial contributions, as did Ed Fiedler and Victor Zarnowitz (Senior Fellows and Economic Counselors) of The Conference Board. In addition, Clyde Conway and Peter Drubin (Production), Chuck Mitchell (Publishing), and John Head (Editorial) were responsible for the layout, design, and editing of the Handbook. Lucie Blau (Economist) guided the manuscript through its final draft to its conclusion.

Grateful acknowledgments are also due to the following former employees of The Conference Board: Michael Boldin (Senior Economist), who oversaw the Business Cycle Indicators program until August 1999; Peggy Cope; Wendy Hegardt; Todd Kulik; Bhashkar Mazumder; Gary Steinman; and Elizabeth Taxon.

Robert H. McGuckin
Director, Economic Research
The Conference Board
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I. Introduction

The Conference Board has produced the main indexes of cyclical activity for the United States since 1995, at which time it was selected by the U.S. Department of Commerce's Bureau of Economic Analysis (BEA) to assume responsibility for three composite (leading, coincident, and lagging) indexes. At that time, The Conference Board decided to continue other aspects of the Business Cycle Indicators (BCI) program as well. Today, it publishes a monthly report, *Business Cycle Indicators*, along the lines of the one originally published by the BEA, and maintains and publishes a database of over 250 economic series that supports its role as custodian of the composite indexes.

This tradition is continued in the *Business Cycle Indicators Handbook*, which extends and expands the original BCI series descriptions compiled and published in 1984. The *Handbook* contains updated and revised descriptions of all series in the *Business Cycle Indicators* database, as well as guidelines for using cyclical indicators and historical information on the composite indexes and the cyclical indicator approach. This work contributes to the advancement and improvement of the general study of business cycles and macro-economic analysis.

History of the Indicators

The development of the cyclical indicators—both the general approach and the BCI database—has a long and interesting history. In its modern form, the approach can be traced to a list of business cycle indicators compiled by Wesley C. Mitchell and Arthur F. Burns for the National Bureau of Economic Research (NBER) in the 1930s.[1] Subsequent work on "Business Cycle Indicators" was conducted by Geoffrey H. Moore as Director of Research at the NBER, along with Charlotte Boschan, Gerhard Bry, Julius Shishkin, Victor Zarnowitz, and others affiliated with the NBER.

In 1961, under the direction of Julius Shiskin at the Bureau of the Census, the U.S. Government began publication of a monthly report, *Business Cycle Developments (BCD)*. This work was undertaken in cooperation with the NBER and the President's Council of Economic Advisers, and made extensive use of time-series charts of NBER indicators (80 U.S. series and indexes of industrial production for seven major trading partners). In 1968, the report was renamed *Business Conditions Digest*, and in 1972, the indicators were shifted to another Commerce Department agency, the Bureau of Economic Analysis.

Electronic distribution of the BCD/BCI series began in 1985, first on diskette, and later through direct dial-up and Internet-based

[1] Mitchell, Wesley C., and Arthur F. Burns. *Statistical Indicators of Cyclical Revivals*, Bulletin 69 (New York: National Bureau of Economic Research, May 28, 1938). Reprint, Geoffrey H. Moore (ed.). *Business Cycle Indicators* (Princeton University Press, for National Bureau of Economic Research, 1961).

services. In 1990, *Business Conditions Digest* was incorporated into the *Survey of Current Business (SCB)*, another BEA publication, as a separate "Business Cycle Indicators" section.

In 1995, the BEA decided to concentrate on the National Income and Product Accounts (NIPA), and transferred its program of research and production of business cycle indicators to The Conference Board. Since then, The Conference Board has improved the indexes, developed a Web-based system for their dissemination, and created a program of research and education on cyclical indicators.

There is much room for additional work on the indicators, as they provide a very useful and constructive approach to both forecasting and analysis. Indeed, The Conference Board has established the new Global Indicators Research Institute (GIRI) to extend the indicators approach to other countries, and it is engaged in the development of new indicators for at least 15 countries. This effort reflects The Conference Board's global vision, and its belief that the indicator approach provides a practical tool for understanding and forecasting economic cycles.

What Does the *Handbook* Contain?

The *Handbook* is divided into five sections. The second section, "Indicator Approach to Business Cycle Analysis," as well as the fourth section, "Components and Construction of Composite Indexes" provide important information about the indicators and how they are used in forecasting. Ataman Ozyildirim updated and extended selected articles from the *Business Cycle Indicators* report on the indicator approach for these sections of the *Handbook*. These sections clarify the distinctions between individual indicator series and the composite indexes (leading, coincident, and lagging) created from them. They also include some cautions on their interpretation, and offer useful tips for their use in forecasting.

The third section of the *Handbook*, "Evaluating the Indicator Approach," consists of a series of articles that appeared, usually in shorter form, in The Conference Board's monthly *Business Cycle Indicators* report. The section begins with a very timely study by Philip A. Klein entitled "The Leading Indicators in Historical Perspective," which shows that most revisions of the indicators involve new and better data series, and the discontinuation of data series that were previously relied upon. This implies, contrary to some critics of the indicators, that changes are not made simply for better historical fits to the data. In the next article, "Reflections on BEA's Experience With Leading Economic Indicators," Barry A. Beckman comments on the BEA's experience with cyclical indicators, and the decision to shift the composite indexes to The Conference Board.

Philip A. Klein's assessment of the indicator approach, and how well it works, follows. He notes at the outset that while this approach has been heavily criticized in the United States, it is a subject of great interest and study overseas. This is not surprising: The development and implementation of the indicator approach was primarily undertaken in the United States, and it is not unusual for those most involved to be the most critical. The last article in this section, "Making the Composite Index of Leading Indicators More Timely," by Robert H. McGuckin, Ataman Ozyildirim, and Victor Zarnowitz, describes research that shows how to make the composite leading index more timely by closing gaps in data availability caused by publication delays in some of the component series. The article discusses improvements in the forecasting ability of the leading index using this procedure, compared with that of the previous methodology. Based on this research, the new procedure will be implemented by The Conference Board during the benchmark revision in early 2001.

The fourth section, "Components and Construction of Composite Indexes," is composed of two parts. The first, "Composite Index Methodology," outlines the five-step procedure that is used to construct the leading, coincident, and lagging indexes, and provides technical notes and references. The components of the composite indexes are also described here. This part includes charts of the composite indexes and the official business cycle dates, as determined by the NBER. The second part in the fourth section, "Revisions to the Composite Indexes," provides a detailed account of revisions to the composite indexes undertaken since The Conference Board assumed responsibility for them. It also describes the annual revisions undertaken to incorporate new and revised data. These "benchmark" revisions are performed to bring the indexes up-to-date with current information from their component indicators. In contrast, the comprehensive revision made in 1996 changed the composition of the indexes.

The second set of comprehensive revisions by The Conference Board was completed in January 2001. It introduces important changes to the index calculation procedures. The new procedures do not affect the composition of the indexes, or their historical performance, but greatly improve the timeliness of the indexes by making them more current by at least two weeks. In the past, the composite indexes usually reflected data two months old at the time of publication; the new procedure results in the release of indexes closer to "real-time". (This means, for example, that February releases will include data through January, not December.) In addition, the revisions will change the visual representation of the composite indexes, making them easier to interpret graphically.

The final section of the *Handbook*, "Data Series Descriptions," provides detailed descriptions of more than 250 time-series contained in The Conference Board's BCI database. The descriptions have been updated from those in the *Handbook of Cyclical Indicators*, published by the Bureau of Economic Analysis in 1984. Not surprisingly, many changes have occurred in these series over the past 16 years, and The Conference Board has made every effort to ensure that the descriptions are as up-to-date and as accurate as possible.

In November 1999, the Bureau of Economic Analysis made major changes in the national accounts, including rebasing most series from 1992 to 1996 dollars. The impact of these changes is summarized by Anne D. Picker in the article entitled "BEA Comprehensive Revisions." The main body of this section contains a description of each indicator, and the changes from the original handbook published by the BEA are substantial. Most series have been modified, and their methodology has changed since the publication of the BEA's *Handbook* in 1984. For example, recent changes in price indexing methods by the BEA and the Bureau of Labor Statistics (BLS) required substantial rewriting.

The format of the data descriptions has also changed from the original. The division of the data into 10 distinct groups differs from the 15 groups of the original *BCI Handbook*. Chapter overviews have been constructed to organize the material, and basic descriptions of each series are separated from technical notes. After each overview, individual series are listed on the left-hand side. The unit used for each series is beneath the series title, while the mnemonics used are in the left-hand margin. Series descriptions are categorized by frequency, with monthly data listed first, and then by economic content. More specific descriptions follow, with practitioner-specific notes provided in the technical note section.

Robert H. McGuckin
The Conference Board

II. Indicator Approach to Business Cycle Analysis

Business cycle indicators have proven to be useful tools for analyzing alternating sequences of economic expansions and contractions known as business cycles. Wesley C. Mitchell and Arthur F. Burns originated the indicator approach that made extensive use of business cycle indicators in the mid-1930s at the NBER. It explores patterns of economic fluctuation that are defined by "business cycles ... [which] consist of expansions occurring at about the same time in many economic activities, followed by similarly general recessions, contractions and revivals which merge into the expansion phase of the next cycle." (Burns and Mitchell, *Measuring Business Cycles*, 1946, p. 21).

Over subsequent decades, the approach was developed and refined, mostly at the NBER under the leadership of Geoffrey H. Moore. Starting in the late 1960s, the U.S. Department of Commerce published the business cycle indicator data and composite indexes of leading, coincident, and lagging indicators. In late 1995, the Business Cycle Indicators program was privatized, and The Conference Board took over the responsibility of maintaining the database and publishing the monthly report.

How Business Cycle Indicators Are Selected

Cyclical indicators are classified into three categories—leading, coincident and lagging—based on the timing of their movements. Coincident indicators, such as employment, production, personal income, and manufacturing and trade sales, are broad series that measure aggregate economic activity; thus, they define the business cycle. Leading indicators, such as average weekly hours, new orders, consumer expectations, housing permits, stock prices, and the interest rate spread, are series that tend to shift direction in advance of the business cycle. For this reason, they get the lion's share of the attention. Nevertheless, it is important to recognize that leading indicators are more meaningful when used within the framework of a system of cyclical indicators—including coincident and lagging indicators that define and describe business cycles.

The lagging indicators, in contrast to the leaders, tend to change direction after the coincident series. Therefore, the lagging series would seem to have little practical value on the surface—indeed, they are often dismissed as inconsequential. To do so, however, ignores vital information about the business cycle process,

because these series help to warn us of structural imbalances that may be developing within the economy. These indicators represent costs of doing business, such as inventory-sales ratios, change in unit labor costs, average prime rate charged by banks, and commercial and industrial loans outstanding. Consumer and social costs are also represented by lagging indicators, such as the ratio of installment credit outstanding to personal income, the change in consumer prices for services, and average duration of unemployment. Thus, an accelerated rise in the lagging indicators, which often occurs late in an expansion, provides a warning that an imbalance in rising costs may be developing. Moreover, the lagging indicators help confirm recent movements in the leading and coincident indicators, and thus enable us to distinguish turning points in these series from idiosyncratic movements.

With a few exceptions, the cyclical indicators included in the BCI database have been subjected to, and have survived, a half-dozen statistical and economic tests, as follows:

Conformity–the series must conform well to the business cycle;

Consistent Timing–the series must exhibit a consistent timing pattern over time as a leading, coincident or lagging indicator;

Economic Significance–cyclical timing must be economically logical;

Statistical Adequacy–data must be collected and processed in a statistically reliable way;

Smoothness–month-to-month movements must not be too erratic; and

Currency–the series must be published on a reasonably prompt schedule.

When these standards are strictly applied, relatively few individual time series pass muster. No quarterly series qualifies for lack of currency, and many monthly series lack smoothness. Indeed, there is no single time series that fully qualifies as an ideal cyclical indicator.

Composite Indexes

In order to emphasize the cyclical patterns in the data and de-emphasize the volatility of individual indicators, the best of them are combined into composite indexes—specifically, into three separate indexes made up of leading, coincident, and lagging indicators. The fourth section of the *Handbook* describes the methodology used to construct these indexes in detail. In the same section, the charts of the leading, coincident, and lagging composite indexes illustrate the relationship of their turning points to each of the past six recessions since 1959. These composite indexes serve as handy summary measures of the behavior of the cyclical indicators and they tend to smooth out some of the volatility of individual series. Use of composite indexes is consistent with the traditional view of the business cycle developed by Burns and Mitchell. In particular, composite indexes can reveal common turning point patterns in a set of economic data in a clearer and more convincing manner than the behavior of any individual component.

The charts also show the timing record of the composite indexes since 1959 in either anticipating (leading index), matching (coincident index), or confirming (lagging index) the turning points in the general economy. Clearly, the peaks and troughs in the coincident index line up closely with the official peak and trough dates from the NBER. The largest deviation is three months at the 1960 peak. Eight of the last 13 turning points match exactly, and all turning points in the coincident index correspond to either the beginning or end of a recession.

The record of the leading index is more variable, and lead times at peaks tend to be longer than at troughs. The leading index has led cyclical downturns in the economy by eight to 20 months, and recoveries by one to ten months. The greatest variance is seen in the relationship between turning points in the lagging index and the general economy. However, the chart of the ratio of the coincident index to the lagging index shows that this ratio anticipates both peaks and troughs. A sharp decline in the ratio signals a large increase (relative to the change in the coincident index) in the costs of doing business, which occur late in an expansion, and are represented by the lagging index. Indeed, the ratio of the coincident to lagging index had rather long leads of between eight and 11 months of business cycle peaks from 1970 to 1990.

This pattern is not a fluke. The lagging indicators tell us when structural imbalances are developing within the economy. The inventory-sales ratio, for example, tells us when inventories are rising faster than sales, suggesting that a dangerous overhang of stocks is accumulating on sellers' shelves. Another lagging indicator, rising interest, suggests a squeeze on the availability of credit. Both of these events are typical ingredients from which recessions are made.

Diffusion Indexes

Diffusion indexes provide another source of useful, but often neglected, information about the business cycle. They tell us how *widespread* a particular business cycle movement (expansion or contraction) has become, and measure the breadth of that movement.

Diffusion indexes measure the number of components that are increasing in any given month. For example, since the leading index has ten components, a diffusion index value of 70 would indicate that seven of the ten components were rising. A diffusion index of zero would indicate that all ten fell. The BCI database includes diffusion indexes over two different time spans, one month and six months, for the components of the leading, coincident, and lagging indexes, and for employment in 356 industries. The one-month span indexes tend to be erratic, while signals from six-month diffusion indexes are much more reliable.

Diffusion indexes are not redundant even though they are based on the same set of data as the composite indexes. On occasion, they move in different directions. A composite index differentiates between small and large overall movements in the component series, while a diffusion index measures the prevalence of those general movements. The difference is often very useful when attempting to either confirm or predict cyclical turning points.

Forecasting Recessions Using the Index of Leading Economic Indicators

Prior to 2001, the leading index for a particular month was typically available about five weeks after the month's end. The new index procedure implemented by The Conference Board (see the third and fourth sections of the *Handbook*) addresses this issue, and provides a more timely index. However, the fact is that peaks (or even troughs, for that matter) cannot always be recognized until months after they occur, especially during periods when the data are subject to significant revision. Therefore, a considerable amount of research has focused on finding a real-time turning point rule, which provides adequate warnings.

Unfortunately, it is imprudent to forecast a recession using a simple and inflexible rule. The U.S. economy is continually evolving, and is far too complex to be summarized by one economic series. Even official recession dates for the U.S. economy are determined by a committee of prominent economists that uses a multitude of indicators rather than a simple rule: "Why not replace all this agonizing over a multiplicity of measures with a simple formula—say, define a recession as two consecutive quarters of decline in GNP? Any single measure is sure to encounter special problems just when they matter the most.... We plan to stick with examining all of the data we can and making an informed judgment." (Robert Hall, Chair, NBER Business Cycle Dating Committee.)

Predicting these turning points is a difficult task even for the best forecasters. In practice, economists and analysts apply rules of thumb to help identify recent turning points and a coming recession. These criteria provide guidelines for interpreting movements in the composite indexes, and for identifying turning points in order to assess the risk of a recession in the short term. For example, three consecutive monthly declines of the leading index appear to be correlated with declines in overall economic activity. This observation has led to the formulation of the long-standing rule of thumb that a three-month decline signals a recession. It is important to emphasize, however, that students of business cycles must consider a variety of factors when interpreting cyclical indicators, and never rely on individual data series or simple rules.

Interpreting Declines in the Leading Index: The Three D's

A practical outcome of business cycle research is a roadmap of the economy over the next six to twelve months. Clearly, knowing whether or not that map contains the pitfalls of a recession is important. But what is also important is to know the direction the economy will take in coming months. That is why interpreting cyclical downturns, whether or not they result in a recession, is of significance. This section focuses on the risk assessment of an approaching recession, but similar arguments can be made to predict recoveries at the end of recessions as well.

Looking at data month by month, it is clear that the leading index has many brief declines that have nothing to do with cyclical downturns in the economy. Indeed, if economists took every one- or two-month decline in the index seriously, they would be forecasting a recession several times each year.

How can one determine, then, when weakness in the leading index represents a true signal of recession ahead rather than just an inconsequential blip in the data? One useful approach is to examine the "Three D's"—the duration, depth, and diffusion of the leading indicators. The longer the weakness continues, the deeper it gets; and the more widespread it becomes, the more likely a recession will occur.

It is not sufficient to draw conclusions based on a single rule. However, in practice, simple rules based on one or more of the Three D's can provide guidelines to interpret and summarize the complex set of interactions and linkages among the cyclical indicators. Thus, using duration, depth, and diffusion, in conjunction or individually, provides the business cycle economist with a lexicon to interpret the vast amount of information gathered from many aspects of the economy, and to assess the likelihood of a recession or recovery.

The leading index does not increase or decrease in long continuous movements. Expansions are interspersed with occasional months of decline, and recessions include months of increase. Regardless, interpreting declines in the leading index using duration facilitates the emergence of short-term patterns or trends. The depth and diffusion of those declines help discern how likely a short-term fluctuation is to be a recession warning. This motivates the use of the Three D's in conjunction with one another.

The duration of a decline is perhaps the most obvious indication of imbalances in the economy, which might eventually enter a recession as a result. However, for reliable interpretation of these declines, most economists also require a significant downward movement in the index, as well as declines in the majority of the component series. These are the second and third aspects of the Three D's—depth and diffusion, respectively. Simply put, the greater the decline (depth), the more likely it is that a serious economic downturn will occur, and the more likely that the decline is not a random fluctuation. By calculating the percent change of the decline over a given span of months, the seriousness of the decline can be assessed. Also, a decline caused by a dramatic fall in just one of the ten components of the leading index may not be serious, but the same percentage decrease caused by seven or eight components falling might be.

In order to demonstrate that using only one of these dimensions is not by itself necessarily successful, consider the three-month rule mentioned above, which relies only on the duration of declines. Whenever the leading index falls for three or more consecutive months, a recession warning, or signal, is said to occur. During the four decades from January 1959 to December 1999 (excluding times the economy was already in a recession), this rule produced twelve such signals. The first months of these declines are listed in Table 1. Four of those warnings (in 1960, 1969, 1979, and 1981) were immediately followed by a recession, and two (in 1973 and 1990) began simultaneously with the business cycle peak. Although the former warn of a coming recession, it is not clear how to interpret the latter, which start with the beginning of a recession. Therefore, at best, these are signals that arrive late. In addition, there are three three-month declines that occur within twelve months of the beginning of a recession (in 1959, 1969, and 1973), that could reasonably be classified as legitimate signals. The remaining four (in 1966, 1978, 1987, and 1995) occur during periods of expansion. All of those periods, except the late 1970's, are business cycle expansions of at least eight years. Therefore, consecutive declines in the leading index during these periods are considered to give false signals because they are not directly associated with a recession.

The problem of false signals based on this rule does not diminish if it is modified by increasing the duration required to signal a recession. Consider instances where the leading index fell for at least four consecutive months. There are seven such occurrences, as shown by the shaded rows in Table 1.

Several times, the leading index fell for three consecutive months, but rose in the fourth month. Such situations, of course, are discarded when looking for declines of four consecutive months in the leading index. Consecutive declines of four or more months are associated with only three of the last six recessions (1969, 1973, and 1990). Of these three declines, only the first immediately precedes a recession; and the others begin simultaneously with the recession. In addition, there are two occurrences within twelve months before the beginning of a recession (1959 and 1973), and two that are not associated with any recessions at all (1966 and 1995). Although the former could be considered legitimate but mixed recession signals, the latter are clearly false signals. Thus, increasing the duration that is required to interpret back to back declines in the leading index as a recession signal—from three months to four months—appears to eliminate two false signals; but the remaining recession warnings become somewhat

Table 1: Consecutive Monthly Declines in the U.S. Leading Index: (January 1959–December 2000)

		Months of Lead Prior to a Business Cycle Peak[2]			
Business Cycle Peak	First Month of Consecutive Declines[1]:	0	1-3	4-12	>12
	July '59			-9	
April '60	January '60		-3		
	April '66				-44
	May '69			-7	
December '69	October '69		-2		
	March '73			-8	
November '73	November '73	0			
	November '78				-14
January '80	October '79		-3		
July '81	May '81		-2		
	October '87				-33
July '90	July '90	0			
	January '95				-72[3]
Number of consecutive declines lasting at least 3 months:		2	4	3	4
Number of consecutive declines lasting at least 4 months:		2	1	2	2

[1] The dates given are the first month of consecutive declines of three months or more. Shaded areas represent consecutive declines of four or more months.

[2] Consecutive declines occurring during a recession are omitted.

[3] As of December 2000.

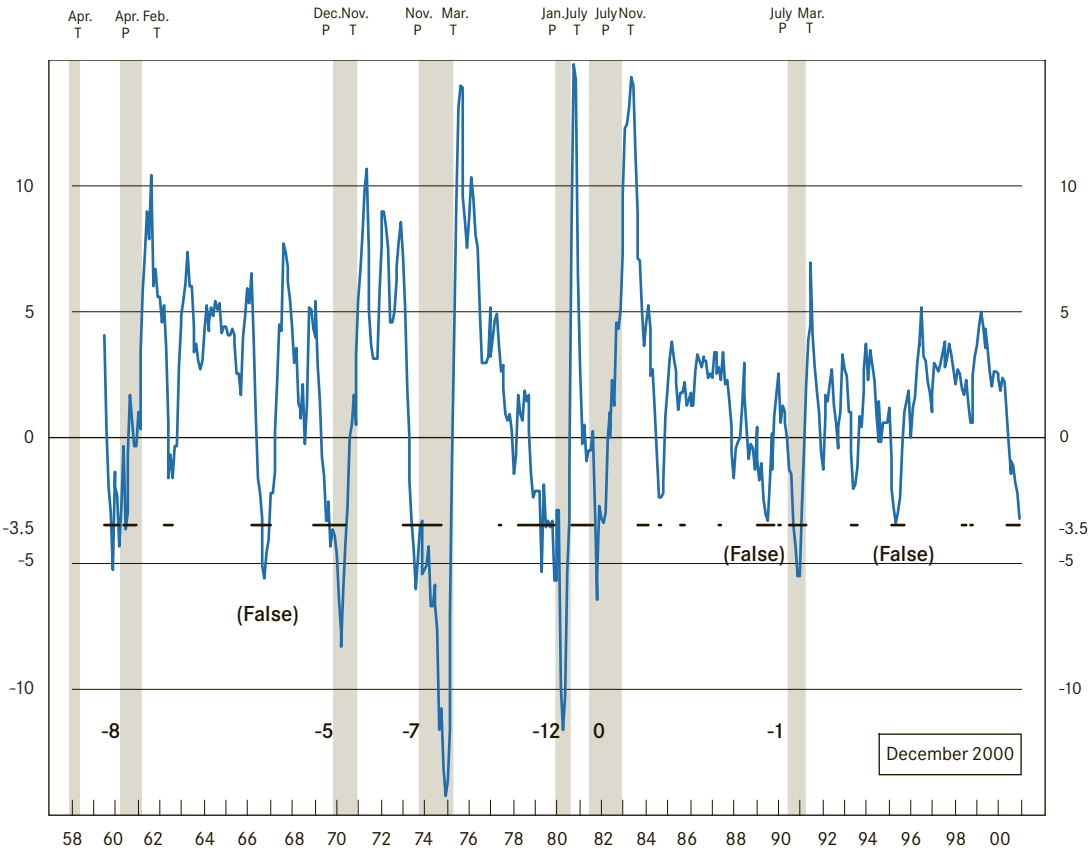
Source: The Conference Board

more confused. If the available data are interpreted more thoroughly (guided by the composite indexes) than is possible by this simple rule, the risks of the economy entering a recession at those times (i.e., in 1966, 1978, 1987, and 1995) can be evaluated more realistically.

A more comprehensive rule—also based on historical analysis—shows that downward movements in the leading index of one to two percent over six months, coupled with declines in more than half of the components, can be reasonable criteria for a recession warning.

To illustrate the historical performance of an operational version[2] of this recession-warning rule, Chart 1 shows six-month annualized percent changes in the leading index, along with a *disjointed* line denoting periods when more than half of its component series were falling (i.e., the diffusion index over the same six-month period was below 50 percent). The chart also shows that a recession has usually just begun, or is imminent, when the following two criteria are met simultaneously across a six-month span: (1) the annualized rate of change in the leading index falls below –3.5 percent over a six-month span; and (2) the diffusion index is below 50 percent. (Please note that -3.5 percent corresponds roughly to the -2 percent level previously reported by The Conference Board. As of the 2001 revision, -3.5 percent is the relevant threshhold to use.)

Chart 1: Six-Month Growth Rate (Annualized) of the Composite Index of Leading Economic Indicators: 1959-2000



Source: The Conference Board

[2] This application is termed an operational version, as it relies on six-month spans and annualized percent declines in the leading index. The rule was intentionally not fine-tuned to perform optimally, and slight variations perform similarly.

Numbers within the chart denote the lead times of each of the past six recessions since 1959. The average lead is five-and-a-half months, compared with an average lead of about eight months for absolute peaks (defined as the high point in a particular time span) in the *level* of the index. It is important to recognize, however, that it usually takes longer than six months, and sometimes years, to determine that a cyclical peak of this nature has occurred.

Besides picking up each recession, this rule does yield one clear false signal (1966) and two borderline cases of false signals (1989 and 1995). It should also be recognized that these predictions of recessions that did not materialize are not necessarily flaws. Sometimes false signals are quite insightful because the leading index is sensitive enough to point to imbalances in the economy that could result in a recession. In 1966, 1984, and 1995, for instance, the leading index turned down significantly, even though a recession did not follow. Because economic growth weakened slightly thereafter, many economists believe that the index warned appropriately that the risk of a recession had increased. It is as though the leading index spotted conditions that often led to a tropical storm, but which turned out to be nothing more than a rain shower.

In the 1981-1982 and 1990-1991 recessions, both criteria were met *as* the economic downturn began, although the leading index had turned down before the recessions started. These recessions developed quickly, surprising almost all of the forecasters.

Clearly, it is easy to think of other closely-related rules which assign different levels of significance to the duration (year-over-year changes in the leading index instead of six-month annualized growth rates), the depth (4 percent instead of 3 percent), or the diffusion (40 percent instead of 50 percent), which could lead to a different assessment of the recession risks prior to these recessions. This suggests strongly that any one rule alone is not sufficient to interpret the data, and a careful analysis of all the business cycle indicators within the context of the domestic and global economic environment is required.[3]

The seeming prevalence of false signals occurs because of reliance on a rule-based, naive reading of the leading index. If all available indicators are interpreted thoroughly, individually as well as in combination, the risks of the economy entering a recession can be evaluated more realistically. As Victor Zarnowitz and Charlotte Boschan pointed out: "There is no single proven

[3] A more sophisticated procedure was developed by Victor Zarnowitz and Geoffrey H. Moore in 1982 (see "Sequential Signals of Recession and Recovery," *Journal of Business*, Volume 55, pages 57-85). It uses sequential signals to assess the probability of an approaching recession. Their recommendation is to monitor the quality, on a current basis, the smoothed six-month growth rate (annualized) of the leading index relative to two percentage bands: 3.3 ± 1.0 and 0 ± 1.0.

and accepted cause of cyclical fluctuations nor a single invariable chain of symptoms…. Some leading indicators, then, would prove most useful in one set of conditions, others in a different set. To increase the chances of getting true signals and reduce those of getting false ones, it is advisable to rely on all such potentially useful indicators as a group." (*Business Conditions Digest*, May 1975). Unfortunately, such a detailed reading of the data is difficult to translate into simple rules, and requires familiarity and practical experience with empirical facts as well as economic theory. The purpose of this *Handbook* is partly to assist followers of business cycles with respect to the former.

Cautions and Conclusions

Interpretation of business cycle indicators, and in particular the composite leading index, is more complex than simple graphs can convey. It is important to recognize that the U.S. economy is continually evolving, and is too complex to be completely summarized with just a few economic series or statistics. Although prior business cycles have shown patterns that are likely to be repeated to some degree and should be watched when predicting turning points, recessions can start and end—sometimes very quickly—for a variety of reasons. Moreover, economic expansions and contractions are not periodic and symmetric. Just as economists continue to debate the relative importance of the various factors that affect aggregate demand and supply—such as monetary policy, oil price shocks, and business confidence—and the manner in which business cycles are propagated, so there is often a wide range of opinion amon g forecasters about the most likely trend for the economy.

These complications confound our ability to quickly perceive the development of a turning point in the economy. Nonetheless, thoughtful and pragmatic analysis of the cyclical indicators yields important information about the business cycle. The indicator approach is useful, because it provides an earlier signal of a turn in the economy than can reliably be found by using other analytical approaches. This section provides only a brief sketch of the indicator approach. It is hoped that it will encourage readers to explore the original sources.

III. Evaluating the Indicator Approach

The Leading Indicators in Historical Perspective

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Business cycle indicators are based on business cycle theory that focuses on substantially "uniform sequences in economic activity." These sequences, to which Wesley C. Mitchell originally called attention, in turn, are revealed in statistical time series indicators that typically lead, coincide, or lag the business cycle. It is the recurrence of these temporal relationships, anticipating, reflecting, and confirming the impact of the cycle on the economy, that give indicators their theoretical explanation, as well as their potential forecasting usefulness.

One can gain a good deal of insight into the relationship between business cycle indicators and the macro-economy by examining with some care the changes which have been made by the successive revisions of the short list of most reliable indicators. First, the lists, together with some explanation of the changes they reveal, will be presented. Then, the significance of these changes will be assessed, in light of the nature of business fluctuations in a modern market-oriented economy.

Successive Lists of Leading Indicators

It is instructive to examine the major short lists of "most reliable" leading indicators that have been produced from time to time. Here, only the components of the leading index, shown in Table 2 will be used. The table includes all the officially revised lists, except for the 1950 list, which is omitted only for reasons of space. It had the fewest changes, which are noted in the discussion that follows.

The first list was prepared by Wesley C. Mitchell and Arthur F. Burns in 1938, and was available at the time they completed writing *Measuring Business Cycles*. It dealt only with expansions (and appeared originally in the NBER's *Bulletin 69*, May 28, 1938). Of particular interest, this list provides a good reflection of the poor state of economic data at that time, with the availability of far fewer series covering the aggregate economy than in later lists. This explains how the large number of sub-sectors included in the 1938 list all exhibited leads (ranging from six months for passenger car production to only three months for pig iron and steel ingots). Presentation of the list ended on a cautionary note about the use of leading indicators that is

* Reprinted by permission from *Business Cycle* Indicators (October and November 1999, Volume 4, Numbers 10 and 11). The author would like to thank Edgar R. Fiedler, Robert H. McGuckin, and Matthew Cottell of The Conference Board, and his secretary, Nancy Cole, at Penn State, for their assistance in preparing this paper.

Table 2: U.S. Business Cycle Leading Indicators[7,a] Short Lists, 1938–1996

1996 Conference Board Leading Indicators[1,b]	1938[2]	1960[3]	1966[4]	1975[5]	1989[6]
1. Average Weekly Hours, Mfg.	**1. Average Work Week**	**1. Same**	**1. Same**	**1. Same**	**1. Same**
2. Initial Claims for Unemployment Ins. (Inverted)	2. ----------	2. Layoff Rate	2. Same (Limited Claims)	2. Same	2. Same
3. Mfrs. New Orders, Consumer Goods and Materials, Constant Dollars	3. ----------	**3. Mfrs. New Orders, Durable Goods Industries[c]**	**3. Same**	**3. Same (Consumer Goods and Materials, 1967 Dollars)**	**3. A. Same** **B. Change in Mfrs. Unfulfilled Orders, 1982 Dollars**
4. Vendor Performance Slower Deliveries, Diffusion Index	4. ----------	4. ----------	4. ----------	4. Vendor Performance, Slower Deliveries Index	4. Same
5. Mfrs. New Orders, Nondefense Capital Goods, Constant Dollars	**5. Industrial Bldg. Contracts, floor space**	**5. Same (Construction Contracts Comm. & Ind. floor space)**	**5. Same (Current Dollars)**	**5. Same (Contracts & Orders for Plant & Equipment, 1967 Dollars)**	**5. Same**
6. Building Permits, New Private Housing Units	**6. Residential Bldg. Contracts, floor space**	**6. Same (Housing Starts)**	**6. Same (Index of New Bldg. Permits, Housing)**	**6. Same**	**6. Same**
7. Index Stock Prices, 500 Common Stocks	**7. Stock Price Index**	**7. Same**	**7. Same**	**7. Same**	**7. Same**
8. Money Supply, M2 (1982 Dollars)	8. ----------	8. ----------	8. ----------	8. Same (M1, 1967 Dollars)	**8. Same (1982 Dollars)**
9. Interest Rate Spread, 10-year Treasury Bonds less Federal Funds	9. ----------	9. ----------	9. ----------	9. ----------	9. ----------
10. Index of Consumer Expectations	10. ----------	10. ----------	10. Change in Consumer Installment Debt	10. A. ---------- B. % change in Total Liq. Assets (Smoothed)	10. A. ---------- B. Change in Credit Outstanding[d] C. Consumer Expectations
	11. Liabilities Bus. Failures	11. A. Liabilities Bus. Failures B. Change in Bus. Pop.	11. Same (Index of Net Bus. Formation)	11. Same	11. ----------
	12. Index of Wholesale Prices	12. Same (Change in Index of Ind. Mat. Prices)	12. Same	12. Same (% Change in Sensitive Prices, WP1 of Crude Materials, Excl. Foods and Feeds)	12. Same
	Plus: Passenger Car Prod. Tot. RR Op. Income Inner Tube Prod. Ton Miles Freight Hauled Truck Prod.	13. Change in Bus. Inventories	13. Same (Change in Book Value, Mfg. & Trade Inventories)	13. Same (Change in Inventories on Hand and on Order, 1967 Dollars, Smoothed)	13. ----------
		14. Corp. Profits (After Taxes)	14. Same	14. ----------	14. ----------
			15. Ratio, Price to Unit Labor Cost, Mfg.		

[1]The Conference Board, "The Cyclical Indicator Approach," *Business Cycle Indicators*, November 1996.
[2]Mitchell and Burns, *Statistical Indicators of Cyclical Revivals*, Bulletin 69, NBER, May 29, 1958. Reprinted in Moore, ed., *Business Cycle Indicators*, vol. 1, NBER (Princeton University Press, 1961), pp. 162-83.
[3]Moore, "Leading and Confirming Indicators of General Business Changes," in *Business Cycle Indicators*, especially Table 2, pp. 56-77.
[4]Moore and Shiskin, *Indicators of Business Expansions and Contractions*, NBER Occasional Paper No. 103, 1962.
[5]Zarnowitz and Boschan, "Cyclical Indicators: An Evaluation and New Leading Indexes," *Business Conditions Digest*, May 1975. Reprinted in *Handbook of Cyclical Indicators*, Department of Commerce, 1975.
[6]Hertzberg and Beckman, "Business Cycle Indicators: Revised Composite Indexes," in *Business Conditions Digest*, January 1989, p. 98.

[a]In addition to the lists shown, other changes were made in 1983 and 1987.

[b]Full titles are given for the 1938 and 1996 lists. In other cases, "Same" means the same economic activity as in the previous list, with the small revisions shown.

[c]This series was added in 1950.

[d]In February 1983, change in liquid assets was replaced by credit outstanding (business and consumer borrowing).

Note: Bold face indicates an area of economic activity that has shown up in all the lists since the data became available. Dashed line indicates that the series was not included.

Sources: National Bureau of Economic Research; The Conference Board

still appropriate: "[The] table ... demonstrates that cyclical upturns in a considerable number of American time series ... have led most or all of the dates with which comparisons can be made; but they have led by intervals that have varied.... 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 centered." (Wesley C. Mitchell and Arthur F. Burns, *Statistical Indicators of Cyclical Revivals*, Ibid. Reprinted in G.H. Moore, *Business Cycle Indicators*, Volume I, NBER, Princeton University Press, 1961, p. 182.)

The 1950 and 1960 lists were produced by Geoffrey H. Moore, based on his long-term work on the empirical dimensions of the U.S. business cycle. The 1950 list (not shown) had very few changes from the 1938 list. The most glaring change was to drop the five sub-sectors just considered. It added two series: manufacturers' new orders in durable goods industries, and new incorporations of businesses. The major series from 1938 were retained (listed in Table 2 as series 1, 5, 6, 7, 11, and 12). Again, Moore echoed the cautions of Mitchell and Burns: "[T]he cautions Mitchell and Burns voiced bear repeating. Most of them are as applicable to recessions as to revivals." (*Ibid*., p. 257)

The changes made in 1960, also the work of Moore, are shown in the table. Aside from some changes in series, the major emendation was to add the change in business inventories and corporate profits. In commenting on the 1960 list in comparison with the 1950 list, Moore again voiced the need for prudent use of indicators: "The movements of leading indicators may foreshadow, in a rough and approximate way, the changes in business activity a few months ahead, but new policies and events can alter what is initially indicated...." (NBER, *41st Annual Report*, May 1961, p. 41.)

In 1966, Moore and Shiskin produced yet another revision of the short 1938 list, this time introducing the system for scoring indicators that are still utilized. Table 2 shows that this list added the change in consumer installment debt and the ratio of price to unit labor cost to the group of most reliable leading indicators, and altered the form of several other leaders to reflect better data sources.

The fifth revision was conducted for the U.S. Department of Commerce by Victor Zarnowitz and Charlotte Boschan in 1975. It added vendor performance and the percent change in liquid assets, and changed the series used to cover several areas on the 1966 list. More important, it was accompanied by two articles that represented a thorough review of the state and usefulness of indicator systems. (Both are reprinted in the *Handbook of Cyclical Indicators*, Washington: U.S. Department of Commerce, May 1977.)

The sixth revision, in 1989, was conducted by Marie P. Hertzberg and Barry A. Beckman of the Bureau of Economic Analysis. It resulted in two additions and two deletions to the leading list. (Marie P. Hertzberg and Barry A. Beckman, "Business Cycle Indicators: Revised Composite Indexes." *Business Conditions Digest*, January 1989, p. 98.) Other changes were made from time to time by the U.S. Department of Commerce; for example, one component was dropped in 1987. Finally, after transfer of the indicator work to The Conference Board, there was yet another formal revision: the 1996 list. This is the list that is currently used in the leading index.

In sum, it may be observed that many series have been retained on the list of "most reliable indicators" from the time the data first became available (as shown in bold face in Table 2). But, there have been revisions as well. All of which raises the question of why the list has been subjected to such frequent revision. This important question shall be addressed next.

Reliable Leading Indicator Lists– Why So Many Revisions?

Since the "uniform sequences in economic activity" to which Wesley C. Mitchell referred, are never precisely uniform, it follows that no two cycles are ever precisely alike. Nevertheless, the existence of a repetitive business cycle leads to the expectation that we can find a "reliable" set of leading indicators. Correspondingly, we would expect that forecasting with such indicators ought to serve us better than, say, naive or *ad hoc* forecasts.

This implies substantial uniformity in the performance of the leading indicators, and raises some questions: Why has the short list of indicators been subject to so much revision? Do the revisions reflect changes in the cyclical sequences that would mitigate against the reliability of the indicators? Or, is the reason to be found elsewhere?"

Why So Many Changes?

There are numerous explanations as to why an indicator might be replaced. The following are representative of those given by the experts who produced the successive "short lists of reliable indicators":

- a quarterly series can be replaced by a monthly series;
- a new series can lead more consistently;
- a new series can avoid duplication with other series, and so produce a clearer list of indicators;
- a new series can provide more complete coverage of the area involved;
- a new series can cover an aspect of performance not previously included;
- a new series can be a deflated series, and so distinguish "real" from "nominal" movements;
- an old series may cease giving reliable (or as reliable as other series) leads;
- an old series may be too slow in becoming available to be useful;
- a new series may appear with a higher Moore-Shiskin score than an old series.

Historically, these generalizations cover most changes to the lists of reliable leading indicators. But there are exceptions. For example, in 1975, the change in consumer installment debt was dropped from the list both because it "lacked timeliness" and also because "its timing in the recent period [had become] very erratic and more nearly coincident than leading at troughs." (Zarnowitz and Boschan, 1975) It was restored in the form of change in credit outstanding on the 1989 list, but was dropped again in the 1996 list.[4]

The clear monitoring of what consumers were doing and thinking has been included one way or another since 1966. However, there have not been any pronounced differences in the behavior of credit change—it has been considered both a leading indicator and a source of economic instability for many years. The treatment of these series by successive indicator lists reflects changing views about data quality.

Another example is The Conference Board's decision in 1996 to drop the change in sensitive prices, most recently measured as the wholesale price index of crude materials, excluding foods and feeds. This series had been put on the list in 1975 by the Zarnowitz-Boschan review, replacing the index of industrial materials prices. The reasoning was that percent changes are better gauges for leading indicators than levels, and that the leads in the change series had been more consistent since the 1960s. (BEA, *Handbook of Cyclical Indicators*, May 1977, p. 175.) Some measure of prices reflecting activity for goods-in-process was included in every list until the current one. The Conference Board determined that the change in sensitive prices series "has shown many ups and downs since the early 1980s," and that "on balance the 1987-1995 performance... earns a low score." (The Conference Board *BCI*, July 1996, p. 4.) Some of the additional volatility may have reflected cyclical behavior in the 1980s (sometimes called "growth cycles") that was less severe than in full blown "classical"

[4] See Rolf Nugent *Consumer Credit and Economic Stability* (New York: Russell Sage Foundation, 1939); *Consumer Installment Credit and Economic Fluctuations* (New York: NBER, 1942); Philip A. Klein, *The Cyclical Timing of Consumer Credit,1920-1967,* NBER, Occasional Paper 113 (New York, 1971).

business cycles. It also may be that the data had become genuinely less reliable; or it might be that this was one of the rare occasions when a reasonably reliable indicator ceased being reliable.

These, however, are exceptions to the general rule. Substitutions or replacements, as well as additions to the list, can improve the general reliability and usefulness of an indicator system. The system itself, however, has been remarkably stable. Yes, on occasion, there may be series that stop leading as reliably as before. In general, however, erratic shifts in timing patterns for once reliable series are extremely rare. In short, the timing patterns of the leading cyclical indicators have never been capricious. Sequences endure, even if those that are most critical in any given business cycle vary. In spite of all the changes taking place in our dynamic economy, the fundamental structure that produces cycles is remarkably stable.

1996 Indicators Up Close

Table 2 shows the ten indicators on The Conference Board's current short list of leading indicators. (Only the 1950 list, with eight indicators, was shorter.) It is the seventh list in 60 years, which suggests an ephemeral quality to leading indicators, unsupported by the facts. The table is a reminder that four series on the current list were included on the 1938 list (average weekly hours, stock prices, building activity in producer goods, and activity in the residential construction sector). The improvement in data over the decades is illustrated by the change in how construction activity is measured: Building permits anticipate the change in contracts for building new floor space, and so provide an even longer leading indicator, covering changes in the housing sector. The critical factor is that from the outset, all four of these anticipations of subsequent "changes in aggregate economic activity" were recognized as useful and important insights into the process by which sequences of cyclical activity spread cumulatively through the economy.

New orders for durable consumer goods, a series included on the current list, was not available in 1938, but has been monitored consistently since 1950. Again, the precise form of the statistical series used to monitor this sector of the economy has changed from time to time, but both new orders for consumer goods and for capital goods were recognized from the beginning as critical dimensions by which business cycles manifested themselves. Indeed, they reflect the fluctuations in investment that both Mitchell and Keynes regarded as central in generating economic cycles.

Another area visible on the current list first became available in 1960—changes in unemployment. The layoff rate was the original method of capturing this dimension of the cycle, but was subsequently replaced by initial claims for unemployment insurance—a series that reflected changing conditions in the labor market more comprehensively.

What of the other four series? Consumer expectations, added in 1989, have already been commented on as an additional way to monitor the consumer sector, along with changes in consumer credit outstanding.

Two more indicators reflect the increased attention being paid to monetary policy. The money supply has been on the list since 1975. It is the only leading indicator that is not a part of one of Mitchell's sequences. It is, rather, in the hands of an outside agency, the Federal Reserve. To those who believe the money supply is an exogenous force in the economy, it represents a stabilizing effort, while, to those who believe the monetary authority is mostly accommodating, it is an endogenous factor. In either case, it had a sufficiently good historical record of leading at business cycle turning points to be added to the list in 1975.

The third additional variable making up the 1996 list of ten indicators, vendor performance, was also added in 1975, when the series first became available. This series offers an early indication of tightening or easing in the balance between supply and demand in the economy, and thus enriches the list.

Finally, the interest rate spread, another financial variable, was the only altogether new indicator added in 1996—because it "has become a widely used forecasting variable." (*Business Cycle Indicators*, December 1996, p. 3.)

Conclusions

- **Over the decades, changes in the lists of "most reliable indicators" have overwhelmingly reflected improvements in the quality of the statistics. More promptly available data, better coverage, substitution of monthly for quarterly data, deflated series, etc., are the reasons behind most revisions.**
- **The number of series deleted because the timing patterns had either changed or weakened is extremely small.**
- **Occasionally, instead of improving, the quality of a given series deteriorates.**
- **More than half the indicators on the current short list have been on earlier lists virtually since the outset. This high degree of stability underscores the enduring quality of the temporal economic sequences to which the lists pertain. The manner in which enterprise-driven economies fluctuate through time is not capricious. The critical sequence may vary from one cyclical episode to the next. There are a number of such sequences that collectively make up the modern aggregate economy—they are not only the backbone of the logic behind indicator systems, they are also the fundamental raw material from which business cycle theory has been developed.**

The overarching conclusion is that virtually all of the revisions enumerated above reflect improvements in data quality, not structural changes in how business cycle sequences unfold or how they are interrelated in the real economy. Consequently, revisions in indicator lists do not mean that the nature of the business cycle changes. Nor do they reflect changes in the way sequences interrelate in the real economy. Instead, they reflect changes in our ability to capture that reality in indicator systems. We are able to monitor the reality better, but the reality itself is remarkably enduring.

References:

Bureau of Economic Analysis, *Handbook of Cyclical Indicators* (Washington: U. S. Department of Commerce), May 1977, p.175.

The Conference Board, *Business Cycle Indicators* (New York: The Conference Board), December 1996, p. 3.

The Conference Board, *Business Cycle Indicators* (New York: The Conference Board), July 1996, p. 4.

Mitchell, Wesley C., and Arthur F. Burns, "Statistical Indicators of Cyclical Revivals," *NBER Bulletin 69* (New York: National Bureau of Economic Research, May 28, 1938). Reprinted in Geoffrey H. Moore, *Business Cycle Indicators*, Volume I, (Princeton: National Bureau of Economic Research, 1961), p. 163.

Zarnowitz, Victor, and Charlotte Boschan, "Cyclical Indicators: An Evaluation and New Leading Indicators," *Business Conditions Digest* (May 1975). Reprinted in *Handbook of Cyclical Indicators* (Washington: Bureau of Economic Analysis), May 1977, p. 175.

Reflections on BEA's Experience with Leading Economic Indicators

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[Editor's note: This article was written by the chief of the Bureau of Economic Analysis's former Business Cycle Indicators branch, Barry A. Beckman, who was involved in producing the composite indexes and the larger set of cyclical indicators for more than two decades. We share this article with our readers because it helps put the transfer of the BCI data to The Conference Board into historical perspective, and sets the stage for upcoming articles that will explore the effects of changes in the composition of the leading index's components on its historical record. The opinions expressed here should not be taken as official policy of either the BEA or The Conference Board.]

In October 1961, at the request of the Council of Economic Advisers, the Bureau of the Census began publishing a monthly economic report based on the business cycle indicators system developed by the National Bureau of Economic Research, a private nonprofit organization. Entitled *Business Cycle Developments*, this report was developed by Julius Shiskin, the Census Bureau's chief economic statistician, working in close collaboration with Geoffrey H. Moore, associate director of research at the NBER.

In addition to providing current and historic data for a collection of economic time series classified by NBER as leading, coincident, and lagging indicators of business cycle turning points, *BCD* contained analytical presentations (such as diffusion indexes, timing distributions, and cyclical comparisons) designed to help users analyze current and prospective economic conditions. Charts showing the behavior of each indicator during the post-World-War-II business cycle expansions and contractions were especially popular with users. *BCD* was one of the first monthly government economic reports to make extensive use of time series charts.

As *BCD* evolved, new and improved series and related information were added. Most of the changes were the result of the joint efforts of the Census Bureau and the NBER. There was a major change in November 1968, when the report was expanded to present a wider selection of data—including the previously unpublished composite indexes of leading, coincident, and lagging indicators—and its title was changed to *Business Conditions Digest* (still *BCD*). Before that time, the composite indexes, which were also were developed by Moore and Shiskin, were made available only to select government officials.

In January 1972, responsibility for the business cycle indicators program, including the composite indexes and *BCD*, was transferred to the Bureau of Economic Analysis. A previously established interagency advisory committee, including Census and BEA, as well as other U.S. government agencies with an interest in the cyclical indicators, continued to provide guidance on the content and presentation of *BCD*. A comprehensive review of the business cycle indicators was soon initiated by BEA in collaboration with Victor Zarnowitz, professor of economics and finance at the University of Chicago, and Charlotte Boschan, senior researcher at the NBER. This review resulted in a major revision of the composite indexes in 1975 that featured the deflation of the leading, coincident, and all but one of the lagging indexes' nominal (current dollar) components. Other revisions to the composite indexes were made from time to time in order to incorporate historical revisions in component data, updated statistical factors, and occasional changes in composition and methodology.

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In response to budget limitations, *BCD* was discontinued in 1990, and a condensed version of its content (including the composite indexes) became a regular feature of the BEA's *Survey of Current Business* in April 1990. The composite indexes also continued to be available to the public in a monthly news release, as well as on the U.S. Department of Commerce Economic Bulletin Board (now STAT-USA).

In May 1995, BEA announced that it intended to terminate its business cycle indicators program and turn the composite indexes of leading, coincident, and lagging indicators over to the private sector. Proposals were solicited from private organizations interested in taking over the monthly compilation and release of the composite indexes. A competitive selection process, which included a formal evaluation of written and oral proposals, resulted in the choice of The Conference Board as the new custodian for the indexes. After a three-month transition period, the transfer of full responsibility took effect following the release of October composite index data on December 6, 1995. Although it was not part of the contractual agreement in 1996, The Conference Board also began publishing a monthly *Business Cycle Indicators* report, which is patterned after the section that BEA dropped from the *SCB*.

Observations

Looking back over BEA's long experience with the composite indexes, several observations stand out:

- The public's interest in the indexes is mixed, and most persons who are interested, focus on the leading index. The coincident and lagging indexes are largely ignored.
- Identifying and interpreting the signals of the leading index when, or soon after, they occur is seldom a straightforward matter. Simplistic techniques are not reliable. For example, some analysts use the "three-month rule," which states that a run of three consecutive declines in the leading index signals a recession. This rule is frequently mentioned in press accounts of the leading index, but it has no official sanction and is too one-dimensional to be legitimate.
- Data revisions and delays in availability accentuate the other difficulties encountered in interpreting movements in the leading index.
- Although the present version of the leading index appears to have a good historical record of signaling business cycle recessions, the index that actually existed at those points in time rarely provided adequate signals of the impending downturns.
- Subsequent modifications to the leading index have improved its historical record by correcting shortcomings in previous business cycles. However, every cycle is different, and what will be unique about the next one cannot be foreseen.
- As a forecasting tool, the leading index must be used with caution and supplemented with other data and information.

Why the Cyclical Indicators Were Discontinued by BEA

At the time the decision to drop the indexes was made, BEA had just launched its Mid-Decade Strategic Plan—a comprehensive multiyear plan to improve its national, regional, and international economic accounts. The plan emphasized the development of updated output measures (especially for services), quality-adjusted prices, and broader measures of investment and capital stock. It also targeted improvements in measures of international transactions. (See the June 1996 *SCB* for more detailed information.)

Recognizing its limited resources, BEA re-evaluated its existing programs and priorities. Compared with other commitments, the business cycle indicators program ranked relatively low in importance. When announcing the decision to discontinue the indicators, Everett M. Ehrlich, the Commerce Department's undersecretary for economic affairs, stated: "Users of economic statistics agree that the foremost problems we face concern the way we measure output, prices, and the nation's capital stock. We need to redirect our resources away from statistical programs, such as the cyclical indicators, that no longer require a government role, and toward these most pressing statistical issues."

There were several factors that made the composite indexes particularly suited to being taken over by the private sector:

- The methodology underlying the composite indexes was well-documented. Several *SCB* articles presented detailed information, including step-by-step instructions on their computation. As a result, many individuals and organizations developed and maintained their own versions of the composite indexes.
- Most of the component data were publicly available from government or private source agencies. Other component data could be computed or estimated from available data by applying methodological information provided by BEA.
- A private agency would have certain advantages in running the cyclical indicators program. For example, because it would not be restricted by the public's perception of "official" government actions, a private agency could be more flexible and adjust more quickly to changing economic situations. However, it still would need to act responsibly to maintain public confidence. (For this reason, The Conference Board assembled its advisory panel of distinguished economists to provide ideas and guidance concerning the composite indexes.)
- Compared with a government agency, a private data producer could provide more commentary on, and analysis of, the indexes' behavior. (The Conference Board has moved in this direction with its monthly *BCI* report, which has provided an ongoing analytical commentary on the recent performance of the leading index and its components.)
- The existence of the NBER's Business Cycle Dating Committee as the universally-accepted authority for determining the peaks and troughs of the business cycle–that is, when recessions begin and end–provides an objective standard against which the performance of the composite indexes can be judged. (The Conference Board is not involved in the selection of these turning points.)

Conclusion

Over the years, the leading index has undergone modifications and recomputations that have improved its historical record. However, there were five business cycle recessions during the time the composite indexes were published by the U.S. Department of Commerce (1968–1995), and in most cases the leading index that existed at the cyclical peak was not able to provide a timely and unambiguous signal of the impending recession. Thus, many analysts lack confidence in the ability of the leading index to signal future downturns. With this in mind, The Conference Board has initiated a substantial program to promote research on business cycle indicators, and to improve the composite indexes. If successful, this effort will result in better-performing indexes that will be effective tools for analyzing business conditions.

Assessing Business Cycle Indicators: An End-of-the-Century Perspective

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Current attitudes toward business cycle indicators in the United States and other countries reveal an interesting contrast. In the OECD countries, and in China, South Africa, and Eastern Europe—diverse countries, indeed—there is rising interest in monitoring business cycle developments by means of the cyclical indicators, particularly the leading indicators. In the United States, on the other hand, where use of indicators originated, a variety of doubts emanate from recent developments in business cycle theory, measurement, and policy. These include the ideas that:

1) Instability in the modern economy is primarily the result of exogenous disturbances (the real business cycle theory) and, therefore, indicators are inappropriate as a means of capturing the primary causes of disturbances;
2) Cyclical indicators are intrinsically inferior to more sophisticated econometric forecasting techniques;
3) The business cycle is merely the normal adjustment process of a modern profit-driven economy, and so disturbances are too minor deserve elaborate monitoring techniques (in other words, indicators are unnecessary or at best unimportant); and
4) Even among some who profess to see value in the cyclical indicators, it is asserted that they are not performing as well as previously.

Each of these four ideas deserves consideration.

The Mitchellian Perspective and the Role of Indicators

Business cycle indicators are an outgrowth of the work of Wesley C. Mitchell, who argued that business cycles are a combination of "sequences among business phenomena ... that are substantially uniform [and] propitious event[s] arising from other than domestic business sources." While every business cycle is in a sense unique, it is the "sequences among phenomena" that they have in common.

It is these sequences that cyclical indicators reflect. For example, it is logical that the average workweek (a leading indicator) will be shortened or lengthened before workers are unemployed or employed (coincident indicators). Changes in employment, in turn, precede changes in the number of workers unemployed for a long time (a lagging indicator). In addition to labor sequences, there are sequences in production, in investment, in financial developments, and in the psychology of entrepreneurs and consumers. Indicators, therefore, reflect business cycle theory that focuses on the sequences in economic activity to which Mitchell called attention.

Because of the unique aspect of every cycle, Mitchell recognized from the outset that "a thoroughly adequate theory of business cycles, applicable to all cycles, is ... unattainable." It follows, incidentally, that a totally reliable set of indicators is equally unattainable. But in 1941, Mitchell also argued that the commonality in all cycles implies that "the theory of business cycles ... need not be given up in despair because it cannot satisfy ideal requirements." Implication: The ongoing effort to capture more of the ways in which enterprise activity in our profit-motivated economy unfolds by improving the indicator system is a realistic and useful task. A better analytical approach, based on the cyclical indicators, can be of real assistance in the ongoing effort to improve the understanding and forecasting of cyclical developments, and to better shape counter-cyclical economic policies.

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Modern Cycles–Partly Exogenous

The indicators can be expected to principally reflect the impact of cyclical changes on the way these sequences manifest themselves over time. The sequences are primarily endogenous. At the same time, exogenous events can have impact on the way these sequences play out at particular moments. So the indicators also at least partially reflect exogenous events, but a first argument would be that no indicator system can truly capture the total impact of exogenous events (such as the oil-price shocks of the 1970s). Such events are reflected in idiosyncratic ways generally unique in time and place. It is the prevailing sequences visible in many cycles that indicators principally reflect, and it is this aspect of cyclical indicators that makes them useful in forecasting. Indicator systems were not designed, nor can they be expected to fully reflect, exogenous factors. This is not their function. What indicator systems are mainly designed to do is shed light on the endogenous aspects of economic instability.

Indicator Systems and Econometric Models

What of the second argument that econometric techniques are superior to indicators? In 1990, Lawrence R. Klein put this idea into appropriate perspective when he wrote that Geoffrey H. Moore was correct in urging that it was important to include leading indicators of cyclical activity in econometric model construction. Writing of Moore's view that leading indicators enhanced econometric models—in light of all those who have urged that indicators and econometric models were competitive approaches to improving forecasts—Klein asserted, "We have come a long way in several decades toward following Moore's suggestion." In short, indicators and econometric models, far from being competitive approaches, are complementary in nature. The state of economic forecasting is still sufficiently imprecise that diverse methodological approaches, far from being appropriately discouraged, need to be encouraged.

Business Cycles–A "Normal" Part of Dynamic Equilibrium?

There is a genuine debate about the degree to which a modern economy can tolerate inflation rates and unemployment rates. The "equilibrium business cycle theory" seems inappropriately applied to, say, the Great Depression (a 25 percent unemployment rate is difficult to describe as part of a normal process). How much instability is "normal" is subjective. But the global effort to improve indicator systems supports the view that, even recently, much of the market-oriented world has seen recurring cyclical manifestations that participants in those economies felt were excessive. These excesses, in turn, justify the search for techniques (including indicators) to better understand, forecast, and (one hopes) stabilize economic activity as it unfolds.

Post-War Performance of Leading Indicators

The fourth argument is that indicators are not performing well. There are many ways to evaluate the performance of cyclical indicators. In 1967, Geoffrey H. Moore and Julius Shiskin devised a technique for grading indicators based on six criteria: conformity, consistent timing, currency, economic significance, statistical adequacy, and smoothness. These criteria were recently applied in The Conference Board's updated revision of the composite U.S. Business Cycle Indicators (see *Business Cycle Indicators*, November 1996).

> In some of these criteria (e.g., statistical adequacy), there has been much improvement in the past few decades. Some years ago, for example, the U.S. Department of Commerce dropped all quarterly series in favor of an indicator system composed exclusively of monthly measures. In terms of other criteria (e.g., conformity), evaluation has been improved by increased knowledge. Previously, the leading indicators were sometimes charged with giving false signals, anticipating turns that never came. It is now

known that all the signals that seemed false were not necessarily so. Rather, some confirmed that the leading indicators anticipate not only downturns in economic activity, but slowdowns as well. Twice in the 1960s, the United States experienced "growth recessions," and the indicator system is sufficiently sensitive that it picked up changes in direction, as well as shifts in the rate of change in aggregate economic performance.

To evaluate the indicators on some of the other criteria, a careful study of the degree to which each indicator tracks aggregate behavior would be required. Even casual perusal of the indicators shown regularly in *Business Cycle Indicators*, however, suggests that while there is considerable variation in the degree of volatility from one indicator to another, there have been no clear changes in volatility from earlier post-war periods to the recent past.

Ultimately, the primary criterion for evaluating the performance of indicators, particularly leading indicators, is the consistency of their timing. This is the characteristic on which their reputation mostly rests, and here we do indeed have evidence to consider (see Table 3). The picture that emerges is quite clear:

- From the outset of the post-war period, the leaders have behaved better at peaks than at troughs;
- Data availability over the period has improved;
- There is no discernible tendency for leads to get shorter at later turns;
- Variability in the length of the leads has always been a problem, and remains so;
- Conformity of all these leaders to the business cycle is high. Of the 75 peak and 76 trough comparisons shown, only four percent of both the peak and trough turns were missed. Three percent of the turns exhibited lags at peaks; seven percent at troughs. If the zero timing turns among those indicators that did not lead are included, it is seen that only eight percent of the peak comparisons failed to show leads, while at troughs the figure was 28 percent. Indeed, the consistency with which leading indicators lead at business cycle peaks is one of the striking findings of Table 3; and
- The leading index leads at all the turning points shown.

In sum, the leading indicators behave better (or at least as well) now as previously, and there is little evidence of deterioration.

Evidence from Other Countries

The Economic Cycle Research Institute has examined rough equivalents of indicators classified in the United States as leading for 13 other market economies. Table 4 shows that, as a group, these indicators have exhibited leading behavior in all the market-oriented countries studied thus far. The precise list of indicators included varies from country to country depending on data availability, but the conclusions concerning how sequences play out in market-oriented economies have been repeatedly confirmed.

Table 3: Timing at Business Cycle Turning Points, Ten Leading Indicators* and Composite Index, 1948-1999

	Lead (-) or Lag (+) at Peaks (months)									Average Lead (-)
	Nov. 1948	July 1953	Aug. 1957	Apr. 1960	Dec. 1969	Nov. 1973	Jan. 1980	July 1981	July 1990	or Lag (+)
Average weekly hours	-11	-3	-21	-11	-14	-7	-10	-7	0	-9.3
Average initial claims	-22	-10	-23	-12	-7	-9	-21	-4	-18	-14
New orders, consumer goods	N/A	N/A	N/A	-13	-3	-8	-10	-2	-2	-6.3
Vendor performance	-7	-8	-28	-14	-4	0	-9	-3	+1	-8.1
New orders, capital goods	N/A	N/A	N/A	-13	-8	+8	-10	-3	-7	-5.5
Building permits	N/A	N/A	-30	-17	-10	-11	-19	-10	-58	-22.1
Stock prices	-5	-6	-1	-9	-12	-10	missed	-8	-1	-6.5
Money supply	N/A	N/A	N/A	missed	-9	-10	-24	missed	-7	-12.5
Interest rate spread	N/A	N/A	-33	-21	-25	-21	-47	-11	-33	-27.3
Consumer expectations	N/A**	N/A**	-9**	-2	-10	-15	-15	-2	-18	-10.1
Composite Index	-5	-5	-20	-11	-8	-9	-15	-3	-6	-9

	Lead (-) or Lag (+) at Troughs (months)									Average Lead (-)
	Oct. 1949	May 1954	Apr. 1958	Feb. 1961	Nov. 1970	Mar. 1975	July 1980	Nov. 1982	Mar. 1991	or Lag (+)
Average weekly hours	-6	-1	0	-2	-2	0	0	-1	0	-1.3
Average initial claims	-6	+4	0	0	-1	-2	-2	-2	0	-1
New orders, consumer goods	N/A	N/A	N/A	0	-1	0	-2	-1	0	-0.7
Vendor performance	-7	-6	-4	-11	+1	-1	-2	-8	0	-4.2
New orders, capital goods	N/A	N/A	N/A	-3	-1	0	-2	+3	2	-0.2
Building permits	N/A	N/A	-12	-2	-10	0	-3	-13	-2	-6
Stock prices	-4	-8	-4	-4	-5	-3	missed	-4	-5	-4.1
Money supply	N/A	N/A	N/A	missed	-7	-2	+7	missed	-4	-3.2
Interest rate spread	N/A	N/A	-4	-10	-15	-8	-3	-22	-21	-11.9
Consumer expectations	N/A**	-6**	+1**	-3	-6	-1	-4	-8	-5	-4
Composite Index	-7	-6	-2	-3	-7	-2	-3	-8	-2	-4

* Lead time for individual indicators are preliminary. They have not gone through the normal review procedures.
** Unofficial estimates.

Source: The Conference Board

Conclusion

Since the appearance of the first short list of "reliable indicators" in 1938, they have been revised a number of times. These revisions almost invariably have reflected the creation of better statistics (better coverage, greater currency, etc.), rather than the appearance of capricious timing (leading indicators becoming lagging or coincident, etc.).

The cyclical indicators, it seems reasonable to conclude today, reflect cyclical activity about as well as ever. While there is (as indeed there always has been) ample room for other methods of assisting in the important task of monitoring and forecasting macroeconomic performance, the business cycle indicators continue to provide useful tools for forecasting and analysis.

References:

Klein, Lawrence R., "Cyclical Indicators in Econometric Models"; Philip A. Klein, *Analyzing Modern Business Cycles*: *Essays Honoring Geoffrey H. Moore* (New York: M. E. Sharpe, 1990), p. 105.

Mitchell, Wesley C. *Business Cycles and their Causes* (Berkeley: University of California Press, 1941), pp. ix, x, and 150.

Moore, Geoffrey, H. and Julius Shiskin, "Indicators of Business Expansions and Contractions", Occasional Paper 10 (New York: National Bureau of Economic Research, 1967).

Table 4: Timing at Business Cycle Peaks and Troughs, Long-Range Gauges, 13 Countries

Country	Number of Business Cycle: Troughs	Peaks	Average Leads (months) at: Troughs	Peaks	Overall
United States	9	9	-6	-11	-8
Canada	2	2	-14	-12	-13
Germany	4	4	-10	-10	-10
France	4	4	-2	-9	-6
United Kingdom	3	3	-13	-20	-17
Italy	3	2	-11	-12	-11
Switzerland	4	4	-15	-13	-14
Sweden	4	3	-7	-10	-9
Japan	2	3	-12	-10	-11
Korea	2	2	-7	-1	-4
Australia	6	5	-7	-15	-11
Taiwan	1	1	-12	-10	-11
New Zealand	6	6	-5	-4	-4

Sources: Economic Cycle Research Institute (New York); The Conference Board

Making the Composite Index of Leading Economic Indicators More Timely

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The Conference Board

The procedure for calculating the Composite Index of Leading Indicators, which The Conference Board took over from the U.S. Department of Commerce in 1995, does not use the most up-to-date information. It ignores currently available data on stock prices and yield spreads in favor of a time-consistent set (i.e., data for a past month for which all components of the index are available). This is a major shortcoming. For example, the U.S. Leading Index published on August 30, 2000, used July data despite the availability of August values for at least two of the components, namely the interest rate spread and stock prices.[5]

Consider two groups of indicator series. In the first group are series that are available in "real time" (i.e., in the current publication period). These variables are generally financial indicators such as stock prices, bond prices, interest rates, and yield spreads. The second group of indicators contains those that are available only with lags (i.e., those variables that are not available in the current publication period). Variables in this group are generally data on various aspects of real macro-economic activity, and price indexes. In the United States, these variables usually lag by one month. Thus, if the most recent value of the index is I_t^C in the publication period under the old index calculation procedure, it is calculated using data from the previous period. The latest values in the first group are not used, which amounts to discarding the most up-to-date information.

Faced with lags in the availability of many series, the practice was to calculate the index with a partial set of components in most foreign countries, and occasionally in the United States. Typically, at least half of the components of an index were required before this procedure was used. For example, according to the rules used by the OECD, the minimum percentage of component series required before a composite index can be calculated lies between 40 and 60 percent, depending on the country (see OECD web page http://www.oecd.org/std/li1.html).

Although such rules create a more up-to-date index, they raise many serious problems. The effective weights used to calculate the contributions of the components, for example, often change dramatically without a consistent set of components. Thus, there is a trade-off between the coverage and the timeliness of the leading index. The more complete its coverage, the less timely is the index.

The New Procedure

The new procedure implemented by The Conference Board with the 2001 revisions combines current financial information with estimates of the values of variables that measure the "real" state of the economy, but are available only with a lag. The new index is constructed with a complete set of components, using actual and projected data for the publication period. The historical series for the index are revised each month when the data not available at the time of publication become available. Such changes are treated as part of the monthly data revisions, now a regular part of the indicator programs.

The main idea behind the more timely Leading Index is that it should incorporate the most recent available values for the variables in the first group, and good, cost-effective estimates of the variables in the second group for the matching period. Thus, instead of the old index,

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[5] Data for nominal money supply, M2, are also available, but the consumer price deflator used to produce the real money supply indicator is not.

I_t^C we have an alternative index, $\hat{I}_t^A$. Here, the symbol ^ refers to a magnitude based at least in part on some kind of forecasting and *t* refers to the latest complete month at the time the value of the index is released (e.g., August for the index published on August 30).[6]

It is conceivable that the new index, $\hat{I}_t^A$, is inferior to the old one, I_t^C. However, using the first group of variables as soon as they are available should give the new index considerable advantage. Other reasons for expecting the procedure to be an improvement are: (1) the errors of the forecast in the second group should be limited, since they typically will be for short intervals (one or a few months); and (2) the individual errors of the components in the second group may offset each other when combined to form the composite index.

There are various ways to forecast the missing variables in the second group. Here, we focus on simple auto-regressive models: A delayed variable is predicted by estimating an *i-th* order auto-regressive model, which relies only on past values of that variable to create forecasts. For example, if only the once-lagged value of the variable will be used to forecast the missing variables, call $\hat{I}_t^1$ the index that uses this model [i.e., AR(1)] to forecast. In our tests, we examine relatively simple lag structures, namely AR(p) models with lag lengths, p, varying from one to four.

Defining the Complete or "Ideal" Benchmark Index

Evaluating the alternative indexes is facilitated by a benchmark to compare the old and new procedures. We use for this purpose the current definition of the Leading Index for the United States produced by The Conference Board. The benchmark index, I_t^B, represents the actual value of the index at each period, based on complete data for all components of both sets of variables. For simplicity, think of the benchmark as an historical index, which is no longer revised. (However, this is not an innocuous assumption, since in practice the recent values of the index are subject to revisions; only after some time [perhaps a year or more] has elapsed, can the values of the benchmark index, I_t^B, be taken as given.)

Because the data for several components of the complete benchmark index are available only with lags, it is impossible to construct the benchmark, I_t^B, in real time for the publication month. However, apart from any data revisions, and assuming complete information can be obtained with a one-month lag, the old index, I_t^C, would equal the benchmark index, I_t^B, for the prior month. That is, the old index, I_t^C, is used as a substitute for the benchmark I_t^B— essentially, a crude first-order, auto-regressive forecast of it. In this sense, the old method is itself a simple projection of the previous month's data to the publication period. The one-month lag applies to the U.S. index, but for other countries, the lags are generally longer and more varied.

Simple Comparisons with Old and Alternative Indexes

Chart 2 shows the benchmark index, I_t^B and the old index, I_t^C for the period January 1970 – January 2000 (361 monthly observations). The two series are very close, but the benchmark index tends to be above the old index, I_t^C. Their differences (I_t^B - I_t^C) are plotted separately to a larger scale on the left-hand side. By far, most of the time, these discrepancies due to missing data and other measurement errors are positive— generally between 0 and 2 on the index scale— and very similar in percentage terms. This bias is most likely the result of data errors and subsequent revisions, which presumably affect the old index more strongly and more adversely than they affect the benchmark index. Over time, the discrepancies between the two indexes remain largely random and relatively small. Interestingly, their volatility appears to be larger in the first half of the period covered (1970-1985) than in the second half (1986-1999).

[6] The forecasts for the United States will be restricted to one month ahead, but for other countries, multi-step forecasts are likely to be necessary.

Chart 3 similarly compares the benchmark index and a version of the new index, which uses two lags of the missing variables to forecast them (i.e., the AR(2) index $\hat{I}_t^A$). It is important to note that the discrepancies from the benchmark are smaller (generally in the range of −1 to +1), and that they are not biased in the sense of being predominantly positive or negative, but are approximately symmetrical around the zero line. Again, however, these series of differences ($I_t^B - \hat{I}_t^A$) show greater volatility in 1970-1985 than in 1986-1999.

Both Charts 2 and 3 are based on historical data that have been subject to revisions. Unrevised real-time data are contaminated by greater measurement errors than revised historical data; hence, the former tend to underperform the latter, particularly when the target of the forecast or analysis is itself taken to be in revised ("true") form. Still, it is instructive to see just how much the measurement errors in the unrevised real-time data affect our results. In order to address this issue, we retrieved the unrevised data on the leading indicators from the archives of the Bureau of Economic Analysis in the U.S. Department of Commerce and The Conference Board.

Unfortunately, the resulting sample of real-time data is short, including only 133 monthly observations from January 1989 to January 2000. The period covers one sluggish period around the recession of July 1990-March 1991, and one ongoing expansion; so it is rather special. For the old procedure, the values of the old index, I_t^C, are created month by month, using only the data that were actually available in the publication month. For the new procedure, the missing components of the alternative index $\hat{I}_t^A$, in each month in the sample, are forecast from an AR(2) equation using data that start in January 1959 and adding one month per each regression. Thus the results are heavily influenced by historical data, especially for the early part of the sample.

Chart 4 shows that most of the time during the 1989-1999 period, the benchmark index, I_t^B, exceeded the old index, so that the discrepancies between the two were positive. ($I_t^B - I_t^C$) had negative values only intermittently in 1989, and more consistently between mid-1990 and mid-1991, as well as in the first half of 1995. Elsewhere, this series stayed positive—first, generally below two, and later (after mid-1996), mostly between two and four.

Chart 5 is similar in that, here again, the benchmark index shows the highest growth, exceeding the new index, $\hat{I}_t^A$, most of the time, and consistently since 1995; thus their discrepancies ($I_t^B - \hat{I}_t^A$) are mostly positive, with some tendency to rise, particularly from mid-1995 to mid-1998.

The explanation for both charts is that the benchmark index is essentially historical, incorporating revisions, whereas the old and new indexes have larger "real-time" components with early data vintages. The leading index components with upward trends are shifted up by cumulative effects of data revisions (i.e., the early data for money supply, new orders for consumer goods and materials, and new orders for nondefense capital goods, all in real terms, underestimate growth relative to the later vintages). What looks like systematic and rising trend differences is solely the result of measurement errors.[7]

Root mean square errors (RMSE) of the distance between the benchmark index and the two indexes, I_t^C and $\hat{I}_t^A$, (i.e., ($I_t^B - I_t^C$) and ($I_t^B - \hat{I}_t^A$)) allow

[7] For earlier discussion of similar properties of data errors and revisions, see Zarnowitz, Victor. "On Functions, Quality, and Timeliness of Economic Information," *Journal of Business*, 55 (1982), pp. 87-119. Also *Business Cycles*: *Theory, History, Indicators, and Forecasting*, Chapter 11 (Chicago: University of Chicago Press, 1992).

Chart 2: U.S. Leading Indexes, 1970-2000: Benchmark vs. Current and Discrepancies (I^B-I^C)

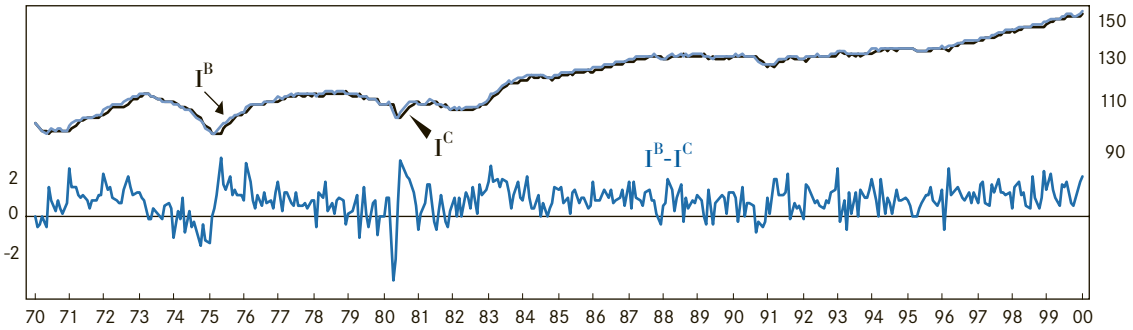


Chart 3: U.S. Leading Indexes, 1970-2000: Benchmark vs. Alternative and Discrepancies (I^B-I^A)

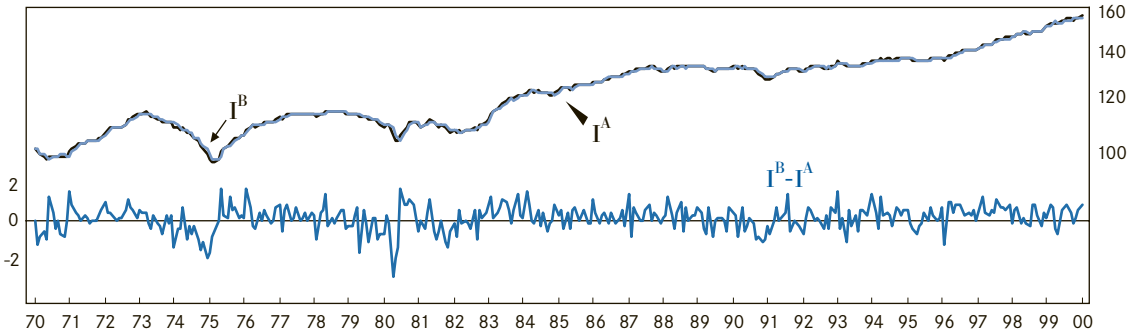


Chart 4: U.S. Leading Indexes, 1989-2000: Benchmark vs. Current and Discrepancies (I^B-I^C)

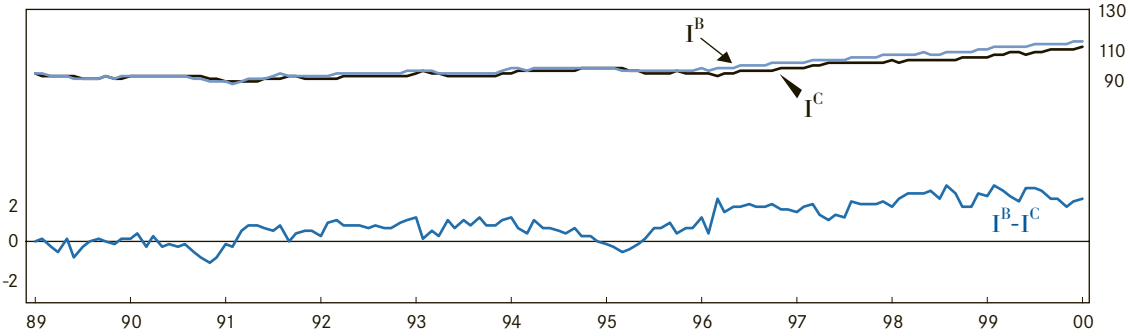
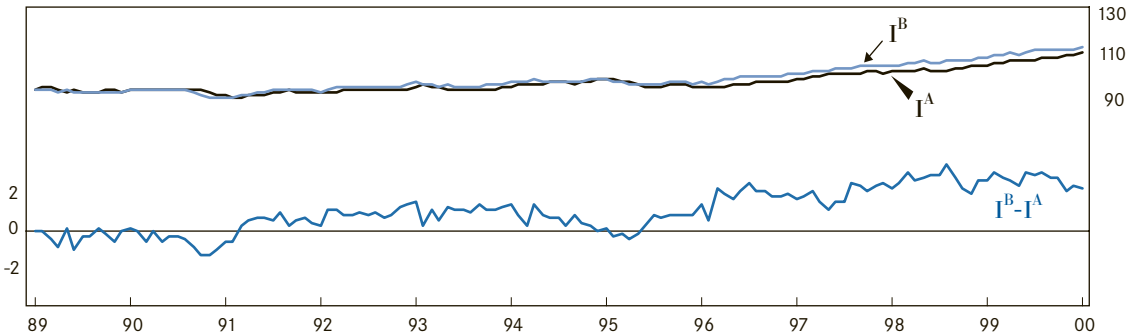


Chart 5: U.S. Leading Indexes, 1989-2000: Benchmark vs. Alternative and Discrepancies (I^B-I^A)



Source: The Conference Board

us to compare these discrepancies over time. We consider four versions of the new index, each depending on how many lags are used to construct the forecasts of the missing data in the publication month. That is, we test not only the AR(2) model, as in our charts (i.e., $\hat{I}_t^2$) but also AR(1), AR(3), and AR(4) models which use 1, 3, and 4 lags to forecast the missing variables (i.e., $\hat{I}_t^1$, $\hat{I}_t^3$ and $\hat{I}_t^4$ respectively)[8]. The RMSE of ($I_t^B - I_t^C$) is 1.011, ($I_t^B - \hat{I}_t^1$) is 0.646, and ($I_t^B - \hat{I}_t^2$) is 0.592. In each case, they show substantial reductions of the discrepancies from the benchmark index as we move from the old index, I_t^C, to the new indexes, $\hat{I}_t^1$ and $\hat{I}_t^2$, and much smaller (or no) improvements with shifts to $\hat{I}_t^3$, and $\hat{I}_t^4$. Thus, for simplicity and uniformity, we choose the AR(2) model as the preferred one.[9]

Next, we will briefly describe some simple tests of the quality of our choice of benchmark, or ideal index, and compare the forecasting performance of the old and new indexes.

Out-of-Sample Forecasts of Relative Changes in the Coincident Index

The Leading Index is widely regarded as a tool to forecast changes in the direction of aggregate economic activity, and in particular the business cycle turning points. The latter have been historically determined by the reference chronologies of the NBER, but they are well approximated by the dates of peaks and troughs in the Coincident Index. As shown in Charts 2 to 5, the indexes I_t^B, I_t^C, and $\hat{I}_t^A$ have, at least in the last three decades, been so close that they can hardly be distinguished by their timing at the major turning points.

We take the U.S. Coincident Index as the measure of the overall performance of the economy. Our tests are based on forecast models that try to predict changes in the Coincident Index using the once-lagged value of itself and the lagged changes in the Leading Index. In other words, we ask whether adding the Leading Index (benchmark, current, or alternative indexes in Table 5, columns 5, 6, and 7, respectively), adds to a simple first order autoregressive model for the Coincident Index (column 4) by reducing errors of out-of-sample forecasts.[10] Thus, we evaluate four basic forecast models. If adding the Leading Index improves forecasts of the Coincident Index, then the forecast model will have lower forecast errors. In this way, we compare the predictive abilities of the various leading indexes.

There are twelve versions of each of the four forecast models, depending on the different timing combinations used, yielding as many RMSE values in Table 5 (columns 4 to 7). This is done in order to mimic several different rules of thumb applied to movements in this index to predict the short-term direction of the Coincident Index. It accommodates the different ways the Leading Index is used to make forecasts of the state of the economy. The alternative lags and unit periods (see columns 2 and 3) should cover a wide variety of ways the Leading Index is used by analysts and forecasters.

In Table 5, columns 4 to11, the historical data sample from January 1970 through January 2000 is used (i.e., 361 monthly observations). We use this sample to create one-month-ahead, out-of-sample forecasts of the Coincident Index. The first **set** of regressions covers the data for

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[8] RMSE = $\sqrt{\frac{\sum e^2}{n}}$ where "e" is equal to (I_t^B-I_t^j), where j = C, 1, 2, 3, 4, and n = 361 for the January 1970-January 2000 sample.

[9] For practical reasons associated with publication of the indicators on a monthly basis, it it desirable to avoid frequent changes in the forecast model.

[10] All variables are in natural logs.

Table 5: Predicting Log Changes in the U.S. Coincident Index, Monthly, 1970-2000

Autoregression and Contributions of Log Changes in the U.S. Leading Index[a]

Line	Lags of Leading Index (in months)[b]	Unit Period (months of changes)[c]	Root Mean Square Errors (RMSE)[d]				Percent Ratios of the RMSE's[e]			
							Eq.(2)	Eq.(3)	Eq.(4)	Eq.(4)
			Eq.(1)	Eq.(2)	Eq.(3)	Eq.(4)	Eq.(1)	Eq.(1)	Eq.(1)	Eq.(3)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1	1	1	3.11	2.94[1]	3.04[3]	3.04[2]	-5.59	-2.14	-2.30	-0.16
2	1	3	3.83	3.61[1]	3.85[3]	3.82[2]	-5.96	0.34	-0.34	-0.68
3	1	6	4.53	3.96[1]	4.28[3]	4.14[2]	-12.49	-5.52	-8.67	-3.33
4	1	12	4.88	3.99[1]	4.29[3]	4.10[2]	-18.26	-12.07	-15.98	-4.45
5	3	1	3.11	2.90[1]	3.02[3]	3.02[2]	-6.74	-2.89	-2.89	0.00
6	3	3	3.83	3.55[1]	3.89[2]	3.90[3]	-7.42	1.35	1.69	0.33
7	3	6	4.53	3.89[1]	4.15[3]	4.01[2]	-14.18	-8.40	-11.38	-3.25
8	3	12	4.88	3.82[1]	4.17[3]	3.94[2]	-21.68	-14.50	-19.30	-5.62
9	6	1	3.11	2.96[1]	3.04[3]	3.02[2]	-4.93	-2.25	-2.73	-0.49
10	6	3	3.83	3.65[1]	3.99[3]	3.99[2]	-4.88	4.00	4.00	0.00
11	6	6	4.53	3.91[1]	4.29[3]	4.12[2]	-13.61	-5.26	-8.94	-3.88
12	6	12	4.88	3.92[1]	4.34[3]	4.07[2]	-19.56	-11.12	-16.48	-6.03

[a] Let DLC (DLI) denote the monthly change in the natural logarithm of the U.S. Coincident Index (Leading Index). The equation (1) regresses DLC_t on DLC_{t-1}. Eq. (2) regresses DLC_t on DLC_{t-1} and DLI^B_{t-1}, where I^B_t is the benchmark Leading Index. Eq. (3) regresses DLC_t on DLC_{t-1} and DLI^C_{t-1}, where I^C_t is the current Leading Index. Eq. (4) regresses DLC_t on DLC_{t-1} and DLI^A_{t-1}, where I^A_t is the selected new Leading Index based on AR (2) component forecasts.

[b] Refers to "i" in the time subscript of the leading index (as in DLI^B_{t-i}, i = l, 3, 6; see note "a" above).

[c] Refers to the span of changes, in months, over which the differences in C_t and I_t are calculated. For example, in lines 2, 6, and 10, three-month changes are used in equations (1) to (4); in lines 4, 8, and 12, twelve-month changes are used in the same equations.

[d] RMSE = $\sqrt{\sum e^2/n}$, where "e" is the one-step-ahead forecast error and "n" is the number of simulated real-time forecasts made. In each of the four equations, the RMSE's summarize 313 regressions based on the sample of 361 monthly observations for January 1970 – January 2000. The first regression was run on data for the first 48 months of the sample, and each of the successive regressions added one more month. Each of the RMSE's reported in columns 4 to 7 sums up the errors of the one-month-ahead forecasts from each of the 313 regressions. The RMSE's for equations (2), (3), and (4) are ranked 1, 2, and 3 for best (lowest), intermediate, and worst (highest), respectively. The ranks are identified by superscripts. Entries are RMSE*10^6.

[e] Here, (1), (2), (3), and (4) stand for the RMSE's for equations (1), (2), (3), and (4), respectively. The percent ratio equals [(2)/(1)-1]*100. Negative ratios indicate reductions of RMSE relative to Eq. (1) in columns 8, 9, and 10, and relative to Eq. (3) in column 11.

Source: The Conference Board

January 1970 to December 1973, producing one-month-ahead forecasts for January 1974. Thus the first set of forecasts is based on 48 observations for January 1970 to December 1973. At this point, we add one more observation (i.e., the actual observation for January 1974), re-estimate all coefficients, and form a one-step-ahead forecast for February 1974. This process continues until the entire sample of observations is exhausted, and we are left with 313 regression forecasts (361 monthly observations minus the 48 observations used for the first set of forecasts) for each of the four equations used. A sequence of simulated real-time forecast errors is then constructed by subtracting the forecasts from the actual realizations. Root mean square errors (RMSE) serve to summarize these numbers.

While Table 5 is based on regressions for the historical sample that goes back to 1970, Table 6 applies the same forecasting exercise to the short sample of real-time data that begin in 1989. Both tables share the same format: the lags and unit periods are identified in columns 2 and 3, the RMSE's in columns 4 to 7, and the ratios of the RMSE's, in percent, in columns 8 to11. In the last four columns, negative ratios indicate that the additions of lagged leading index terms reduce the RMSE's relative to the autoregressions of changes in the coincident index Eq.(1), or the regressions with the current index Eq.(3).

A glance at Table 5 shows the prevalence of minus signs in the last four columns, which is gratifying. All but eight of the 48 entries (83 percent) are negative. The same prevalence of improvements is found in Table 6 (columns 8 and 11), which means that the results obtained with the benchmark index data are better than the autoregression of changes in the Coincident Index, and that the new index data from $\hat{I}_t^A$ work better than the old index data from I_t^C. However, the predominantly positive signs in columns 9 and 10 of Table 6 suggest that both old and new indexes fail to contribute to the autoregression of the changes in the Coincident Index in this small sample of unrevised data for the 1990s.

Table 6: **Predicting Log Changes in the U.S. Coincident Index, Monthly, 1989-2000**

Autoregression and Contributions of Log Changes in the U.S. Leading Index*

Line	Lags of Leading Index (in months)*	Unit Period Root (months of changes)*	Root Mean Square Errors (RMSE)**				Percent Ratios of the MSE's*			
			Eq.(1)	Eq.(2)	Eq.(3)	Eq.(4)	Eq.(2) / Eq.(1)	Eq.(3) / Eq.(1)	Eq.(4) / Eq.(1)	Eq.(4) / Eq.(3)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1	1	1	2.08	2.02[1]	2.09[2]	2.10[3]	-2.92	0.46	0.69	0.23
2	1	3	2.30	2.31[2]	2.29[1]	2.34[3]	0.28	-0.28	1.69	1.98
3	1	6	2.66	2.58[1]	2.77[3]	2.71[2]	-3.00	3.87	1.61	-2.18
4	1	12	3.00	2.82[1]	3.22[3]	3.09[2]	-5.84	7.50	2.90	-4.27
5	3	1	2.54	2.35[1]	2.68[3]	2.49[2]	-7.42	5.52	-1.80	-6.94
6	3	3	3.06	2.92[1]	3.44[3]	3.27[2]	-4.65	12.34	6.98	-4.78
7	3	6	2.66	2.66[1]	3.05[3]	2.84[2]	-0.28	14.57	6.74	-6.83
8	3	12	2.53	2.43[1]	2.68[3]	2.57[2]	-4.05	5.68	1.55	-3.91
9	6	1	2.54	2.36[1]	2.76[3]	2.52[2]	-7.08	8.92	-0.86	-8.98
10	6	3	2.53	2.46[1]	2.74[3]	2.65[2]	-3.08	8.16	4.49	-3.39
11	6	6	2.66	2.62[1]	3.19[3]	2.97[2]	-1.49	19.86	11.58	-6.91
12	6	12	3.06	3.06[1]	3.75[3]	3.45[2]	0.11	22.80	12.82	-8.13

*See Table 5 notes a, b, c, and e respectively.

**See Table 5, note d. In addition, in each of the four equations, the RMSE's summarize 97 regressions based on a sample of 133 monthly observations for January 1989 - January 2000. The first regression was run on data for the first 36 months of the sample and each of the successive regressions added one more month. Each of the RMSE's reported in columns 4 to 7 sums up the errors of the one-month-ahead-forecasts from each of the 97 regressions.

Source: The Conference Board

The Proposed New Procedure Consistently Outperforms the Current One

For the full historical sample, which we believe yields more significant results than the short "real-time" sample, our results are clearly supportive of the proposed new procedure. Eq.(4), which uses the new index data, has lower RMSE's than Eq.(3), which uses the old index data in eleven of the twelve cases covered; also, the new index, $\hat{I}_t^A$, produces better results than the autoregressions of the changes in the Coincident Index in ten out of twelve lines (compare column 7 with columns 6 and 4 in Table 5). Throughout, Eq.(2), with the benchmark index data, ranks first with the lowest RMSE's; Eq.(4), with the new index data, ranks second; and Eq.(3) with the old index data, ranks third in predicting the Coincident Index. However, note that even Eq.(3) tends to work better here than the autoregressions of Eq.(1). The consistency of the results shown by the superscripts in columns 5, 6 and 7 is impressive.

Simple averages of the RMSE's in Table 5 are 3.59 for the regression forecasts with the benchmark index I_t^B, 3.76 for those with the new alternative index $\hat{I}_t^A$, 3.86 for those with the current index I_t^C, and 4.09 for the autoregressive forecasts (referring to means of columns 5, 7, 6, and 4, respectively).

In Table 6 as well, Eq.(2) forecasts rank first in terms of lowest RMSE's; Eq.(4) forecasts rank second; and Eq.(3) forecasts rank third (see superscripts in columns 5, 6, and 7). That is, again, the hypothetical benchmark index, I_t^B, is best, and the new index, $\hat{I}_t^A$, approximates it more closely than the old index. The differences between the RMSE's, however, here and in Table 5, are often small.

Whereas, for the longer historical sample, the autoregressions are inferior, for the short real-time sample, they yield on average smaller RMSE's than either the equation that uses the old index data or the one that uses the new index data. The mean RMSE's in Table 6 are 2.55 for the regression forecasts with I_t^B data; 2.64 for the autoregressive forecasts; 2.75 for those with $\hat{I}_t^A$ data; and 2.89 for those with I_t^C.

Conclusion

The new approach to constructing the Leading Index uses available information more efficiently than the previous method. Combining projected values for data missing in the publication period, and actual values for the available data such as stock prices and interest rate spread, appears to have significant advantages over the prior method, which waits a month and reports late. It is a superior alternative to using rules such as the 50 percent rule discussed earlier. Because of such consistent, if often small, improvements, the proposed approach was adopted by The Conference Board.

IV. Components and Construction of Composite Indexes

Composite Index Methodology

The first part of this section provides details on the calculation of the various composite and diffusion indexes from coincident, leading, and lagging indicator components. It also offers a detailed discussion of the technical aspects of the index construction methodology, such as standardization factors and updating, and lists the current components of the composite indexes, with a brief discussion of each component. Finally, it concludes with charts of the composite indexes, and Table 8, which lists official business cycle dates, as determined by the National Bureau of Economic Research (NBER).

Since before the transfer of the Business Cycle Indicators Program to The Conference Board in 1995, the indicators and composite indexes have been reviewed and revised regularly, first at the NBER, and later at the U.S. Department of Commerce's Bureau of Economic Analysis. The details and effects of these are discussed in the articles in the third section of the *Handbook*. The second part of this section describes the periodic revisions that are made to the indexes, and discusses some minor procedural changes that have occurred over the years. It then presents, in some detail, the revisions that have occurred since The Conference Board took over the BCI program.

Construction of Composite Indexes

The procedure for calculating the composite indexes has five distinct steps:

(1) Calculate month-to-month changes, $r_{i,t}$, for each component, $X_{i,t}$ where i=1,...,n. For the components that are in percent form, simple arithmetic differences are calculated: $r_{i,t} = X_{i,t} - X_{i,t-1}$.

In all other cases, a symmetric percent change formula is used: $r_{i,t} = 200 * \frac{(X_{i,t} - X_{i,t-1})}{(X_{i,t} + X_{i,t-1})}$.

(2) Adjust the month-to-month changes by multiplying them by the component's standardization factor, w_i. The results of this step are the monthly contributions of each component $c_{i,t} = w_i * r_{i,t}$. See section on standardization factors for an explanation of w_i.

(3) Add the adjusted month-to-month changes (across the components for each month). This step results in the sum of the adjusted contributions, $S_t = \sum_{i=1}^{n} C_{i,t}$.

(4) Compute preliminary levels of the index using the symmetric percent change formula.

The index is calculated recursively, starting from an initial value of 100 for the first month of the sample (i.e., January 1959). Let $I_1 = 100$ denote the initial value of the index for the first month. If s_2 is the result from Step (3) in the second month, the preliminary index value is:

$$I_2 = I_1 * \frac{(200 + s_2)}{(200 - s_2)} = 100 * \frac{(200 + s_2)}{(200 - s_2)}.$$

Then the next month's preliminary index value is:

$$I_3 = I_2 * \frac{(200 + s_3)}{(200 - s_3)} = 100 * \frac{(200 + s_2)}{(200 - s_2)} * \frac{(200 + s_3)}{(200 - s_3)},$$

and so on for each month that data are available.

(5) Rebase the index to average 100 in the base year (currently 1996). The preliminary levels of the index obtained in Step (4) are multiplied by 100, and divided by the mean of the preliminary levels of the index in the base year.

Construction of Diffusion Indexes

Diffusion indexes measure the proportion of the components that is rising. Components that rise more than 0.05 percent are given a diffusion value of 1.0, components that change less than 0.05 percent are given a diffusion value of 0.5, and components that fall more than 0.05 percent are given a diffusion value of 0.0. Diffusion indexes are based on actual changes in the components, not the rounded contributions, which are sometimes reported as 0.00 when a small positive or negative change occurred. Then, the different values are added for each month and multiplied by 100 and divided by the number of components for that month. Because month-to-month diffusion indexes are very volatile, they are also reported over six-month spans using the same procedure.

Standardization Factors

Standardization factors determine how monthly changes in each component contribute to the monthly change in the associated index. These factors are designed to give each component a similar opportunity to contribute to the change in the index in any given month. Adjustments equalize the volatility of each component in an index. They are based on the inverse of the standard deviation of the symmetric changes in the series. The component standardization factors are also normalized to sum to one.

The standardization factors are updated during the annual benchmark revision to incorporate any data revisions that have occurred in the preceding twelve months. After the 2001 benchmark revision, data from the 1959-1999 period are used with a few adjustments to calculate these factors. For the leading index, two separate sample periods are used: 1959-1983 and 1984-1999. (Note: Table 7 only shows the factors for the latter period. See the Web site, www.tcb-indicators.org for an up-to-date list of the standardization factors.)

Updating the Indexes

When updating the indexes, Steps (1) through (4) are followed for the most recent and previous six months of data. Revisions in the components that fall outside of this moving six-month window are not incorporated, and the rebasing in Step (5) does not need to be repeated. The benchmarking process described later in this section incorporates those revisions once a year.

Current Components of the Composite Indexes

Below, we present a detailed discussion of the components of the composite indexes. Chart 6 shows the history of these indexes since 1959. The full history of composite and diffusion indexes is available on the Internet at www.tcb-indicators.org. The components of the leading index and the database of monthly business cycle indicators are also available by subscription.

Table 7: Composite Index Factors, 2001

Leading Indicators	Standardization Factors
BCI-01 Average weekly hours, manufacturing	.1899
BCI-05 Average weekly initial claims for unemployment insurance*	.0240
BCI-08 Manufacturers' new orders, consumer goods and materials	.0489
BCI-32 Vendor performance, slower deliveries diffusion index	.0271
BCI-27 Manufacturers' new orders, nondefense capital goods	.0125
BCI-29 Building permits, new private housing units	.0184
BCI-19 Stock prices, 500 common stocks	.0304
BCI-106 Money supply, M2	.3034
BCI-129 Interest rate spread, 10-year Treasury bonds less Federal funds (%)	.3274
BCI-83 Index of consumer expectations	.0180
Coincident Indicators	
BCI-41 Employees on nonagricultural payrolls	.4790
BCI-51 Personal income less transfer payments	.2830
BCI-47 Index of industrial production	.1290
BCI-57 Manufacturing and trade sales	.1090
Lagging Indicators	
BCI-91 Average duration of unemployment*	.0370
BCI-77 Inventories to sales ratio, manufacturing and trade	.1230
BCI- 62 Change in labor cost per unit of output, manufacturing (%)	.0620
BCI-109 Average prime rate charged by banks (%)	.2430
BCI-101 Commercial and industrial loans outstanding	.1280
BCI-95 Consumer installment credit outstanding to personal income ratio	.2210
BCI-120 Change in consumer price index for services (%)	.1860

*** Inverted series-a negative change in this component contributes positively to the index.**

% Percent change form-contributions based on arithmetic changes.

Note: A methodological or measurement break in BCI-101 (commercial and industrial loans outstanding) after 1987 is handled by making the change in this series a missing value in January 1988 (for computing both component standardization factors and contributions to the lagging index.

When computing historical revisions and monthly updates to the composite indexes, rounding is avoided whenever possible. One exception is the standardization factors, which are calculated to four decimal places. The contributions are typically reported to two decimal places, and the composite indexes are rounded one decimal. The final rounding, together with the symmetric percent change formula in Step (4), is the reason the rounded sum of the reported contributions from each component does not always equal the simple percent change in the rounded index.

Source: The Conference Board

Leading Index Components

BCI-01 Average weekly hours, manufacturing: This series measures average hours worked per week by production or factory-type workers in manufacturing industries. The source is the U. S. Department of Labor's Bureau of Labor Statistics, which surveys payroll records as part of its comprehensive monthly report based on employment conditions; it is adjusted for predictable seasonal variation. Also known as "factory hours," this component tends to lead the business cycle because employers usually adjust work hours before increasing or decreasing their workforce.

BCI-05 Average weekly initial claims for unemployment insurance: This series measures the average number of new claims for unemployment compensation (only first-time filings for a specific episode of unemployment) per week (averaged over a four-week span that best covers each month). The source is the U.S. Department of Labor, which makes adjustments for predictable seasonal variation. The number of new claims filed for unemployment insurance is typically more sensitive than either total employment or unemployment to overall business conditions, and this series tends to lead the business cycle. Because initial claims increase when employment conditions worsen (layoffs rise), this series is inverted when included in the leading index (i.e., the signs of the month-to-month changes are reversed).

BCI-08 Manufacturers' new orders, consumer goods and materials (in 1996 $): This series tracks orders for goods that are primarily used by consumers. The source for current-dollar values is the Census Bureau's M3 report, which includes seasonal adjustments. The Conference Board computes this inflation-adjusted version using price indexes from various sources (at the industry level) and a chain-weighted price index formula. New orders lead actual production because they directly affect the level of both unfilled orders and inventories that firms monitor when making production decisions.

BCI-32 Vendor performance, slower deliveries diffusion index: This index measures the relative speed at which industrial companies receive deliveries from their suppliers. It is part of a monthly survey conducted by the National Association of Purchasing Management (NAPM) that asks purchasing managers whether their suppliers' deliveries have been faster, slower, or the same as the previous month. The slower-deliveries diffusion index counts the proportion of respondents reporting slower deliveries, plus one-half of the proportion reporting no change in delivery speed. Slowdowns in deliveries increase this series and are most often associated with increases in demand for manufacturing supplies (as opposed to a negative shock to supplies). Therefore, they tend to lead the business cycle.

BCI-27 Manufacturers' new orders, nondefense capital goods (in 1996 $): This series tracks orders received by manufacturers in nondefense capital goods industries, and is the producers' counterpart to BCI-08. The source for current-dollar values is the Census Bureau's *M3* report, which includes seasonal adjustments. The Conference Board computes this inflation-adjusted version using price indexes from various sources (at the industry level), and a chain-weighted price index formula. As with BCI-08, new orders lead actual production, and orders for capital goods, in particular, tend to lead the business cycles.

BCI-29 Building permits, new private housing units: This series measures the monthly change in the number of housing units authorized by local permit-issuing places. The source is the Census Bureau, which conducts a survey that currently covers approximately 95 percent of all new residential construction in the United States, and it is adjusted for substantial seasonal

variation. The number of residential building permits issued is an indicator of construction activity, which typically leads most other types of economic production.

BCI-19 Stock prices, 500 common stocks: This series, also known as the "S&P 500", reflects the price movements of a broad selection of common stocks traded on the New York Stock Exchange. It is computed and reported by the Standard & Poor's division of McGraw-Hill, Inc. Increases (decreases) of this stock index can reflect both the general sentiments of investors and the movements of interest rates, both of which are good indicators for future economic activity.

BCI-106 Money supply (in 1996 $): This series is an inflation-adjusted version of the M2 money supply, which includes currency, demand deposits, other checkable deposits, travelers checks, savings deposits, small denomination time deposits, and balances in money market mutual funds. M2 in current dollars is reported in seasonally adjusted form by the Federal Reserve. The Conference Board adjusts for inflation using the implicit deflator for personal consumption expenditures. When the money supply does not keep pace with inflation, bank lending may fall in real terms, making it more difficult for the economy to expand.

BCI-129 Interest rate spread, 10-year Treasury bonds less Federal funds rate: This spread, or difference between long and short rates, is a simple measure of the slope of the yield curve. The series is constructed using the 10-year Treasury bond rate and the Federal funds rate, an overnight interbank borrowing rate, as reported by the Federal Reserve. It is felt to be an indicator of the stance of monetary policy and general financial conditions, because it rises (falls) when short rates are relatively low (high). When it becomes negative (i.e., short rates are higher than long rates, and the yield curve inverts), its record as an indicator of recessions is particularly strong.

BCI-83 Index of consumer expectations: This index reflects changes in consumer attitudes concerning future economic conditions and, therefore, is the only indicator in the leading index that is completely expectations-based. Data are collected in a monthly survey conducted by the University of Michigan's Survey Research Center. Responses to the questions concerning various economic conditions are classified as positive, negative, or unchanged. The expectations series is derived from the responses to three questions relating to: (1) economic prospects for the respondent's family over the next 12 months; (2) the economic prospects (for the entire nation) over the next 12 months; and (3) the economic prospects over the next five years.

Coincident Index Components

BCI-41 Employees on nonagricultural payrolls: This series, often referred to as "payroll employment," includes both full-time and part-time workers, and does not distinguish between permanent and temporary employees. The source is the Bureau of Labor Statistics. Because the changes in this series reflect the actual net hiring and firing of all but agricultural establishments, government agencies, and the smallest businesses in the nation, it is one of the most closely watched series for gauging the health of the economy.

BCI-51 Personal income less transfer payments (in 1996 $): This series represents the aggregate value of the income received by individuals and is stated in inflation-adjusted dollars. It includes all sources such as salaries and other earnings, but excludes government transfers such as Social Security payments. Also, an adjustment is made for wage accruals less disbursements (WALD), that smoothes bonus payments to more accurately reflect the level of income that wage earners would use on which to base their consumption decisions. The source for the current-dollar value of income is the BEA.

The Conference Board adjusts the data for inflation using the implicit deflator for personal consumption expenditures from the same BEA report. Income levels are important because they help determine both aggregate spending and the general health of the economy.

BCI-47 Index of industrial production: This index is based on value-added concepts, and covers the physical output of all stages of production in the manufacturing, mining, and gas and electric utility industries. The source is the Federal Reserve, and it is constructed from numerous sources that measure physical product counts, values of shipments, and employment levels. Adjustments are made for predictable seasonal variation. This index has historically captured a majority of the fluctuations in total output, although the value-added of the industrial sector is only a fraction of the total economy.

BCI-57 Manufacturing and trade sales (in 1996 $): This series tracks sales at the manufacturing, wholesale, and retail levels. The data are collected as part of the NIPA calculations, and are reported in inflation- and seasonally-adjusted form by the U. S. Department of Commerce's BEA. The level of aggregate sales is always larger than GDP when annualized, because some products and services are counted more than once (e.g., as intermediate goods or temporary additions to wholesale inventories and a retail sales). This series represents real total spending, which is invariably procyclical, but it is much more volatile than the other three components of the coincident index.

Lagging Index Components

BCI-91 Average duration of unemployment: This series measures the average duration (in weeks) that individuals counted as unemployed have been out of work. The source is the Bureau of Labor Statistic's comprehensive monthly report on employment conditions. Because this series tends to be higher during recessions and lower during expansions, it is inverted when included in the lagging index (i.e., signs of the month-to-month changes are reversed). The sharpest increases in the average duration of unemployment, which produce declines in the inverted version of the series, tend to occur after a recession has begun (when layoffs are high and hiring is slow). Rebounds invariably occur only after an expansion gains strength.

BCI-77 Inventories to sales ratio, manufacturing and trade (based on 1996 $): The ratio of inventories to sales is a popular gauge of business conditions for individual firms, entire industries, and the whole economy. This series is calculated by the BEA , using inventory and sales data for manufacturing, wholesale, and retail businesses (in inflation- and seasonally-adjusted form), based on data collected by the Census Bureau. Because inventories tend to increase when the economy slows and sales fail to meet projections, the ratio typically reaches its cyclical peaks in the middle of a recession. It also tends to decline at the beginning of an expansion, as firms meet their sales demand from excess inventories.

BCI- 62 Change in labor cost per unit of output, manufacturing: This series measures the rate of change in an index that rises when labor costs for manufacturing firms rise faster than their production (and vice-versa). The index is constructed by The Conference Board from

various components, including seasonally adjusted data on employee compensation in manufacturing (wages and salaries plus supplements) from the BEA, and seasonally-adjusted data on industrial production in manufacturing from the Federal Reserve. Because monthly percent changes in this series are extremely erratic, percent changes in labor costs are calculated over a six-month span. Cyclical peaks in the six-month annualized rate of change typically occur during recessions, as output declines faster than labor costs, despite layoffs of production workers. Troughs in the series are much more difficult to determine and characterize.

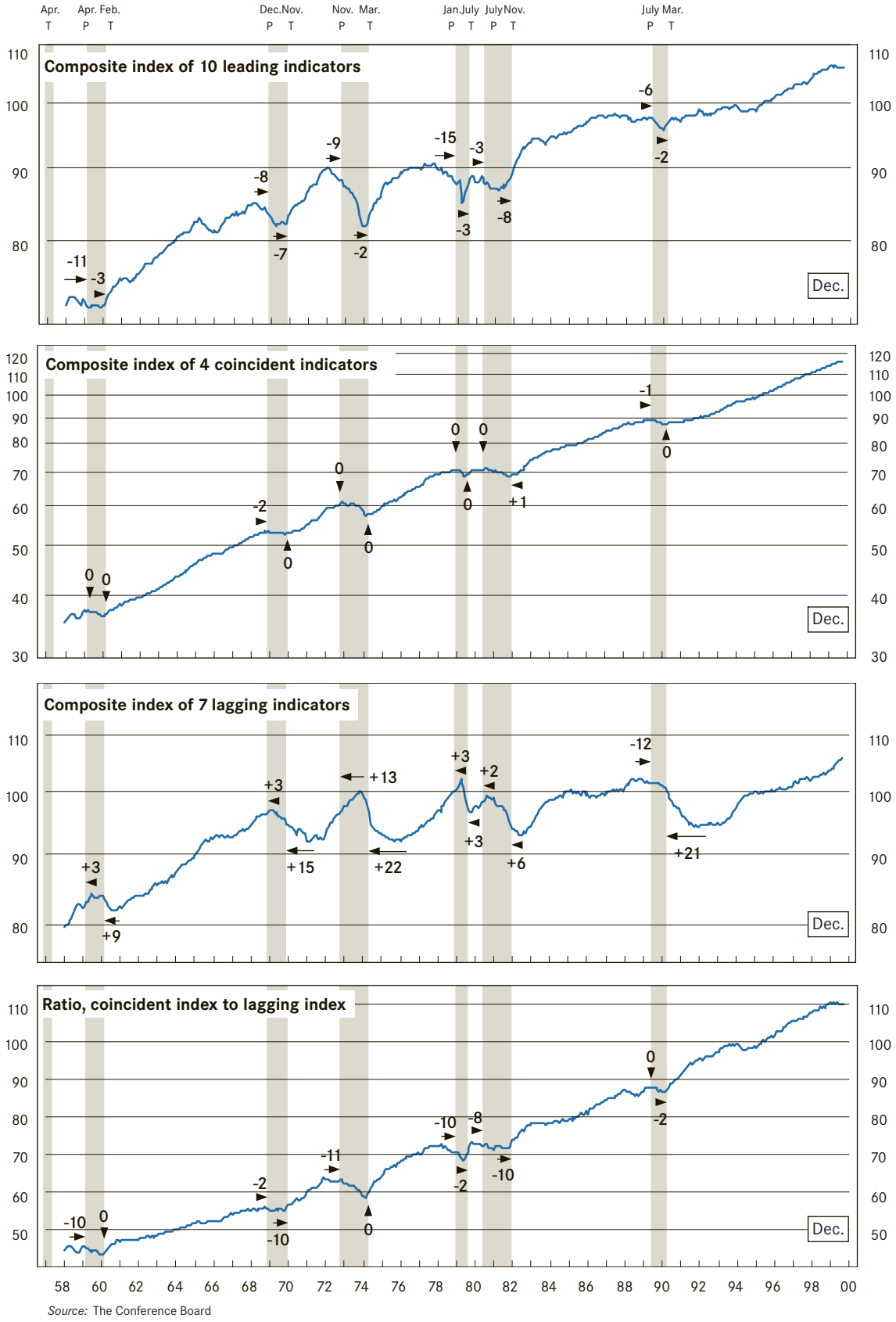
BCI-109 Average prime rate charged by banks: This series, known as the "prime rate," is typically interpreted as the rate charged to a bank's least risky borrowers, and has historically been the benchmark used to establish interest rates for different types of loans. The data are compiled by the Federal Reserve. The prime rate was originally considered a lagging indicator because it was felt that changes in the prime rate lagged behind the movements of general economic activity. A nominal rate was selected, even though most business cycle indicators are expressed in real- or inflation-adjusted terms. There is some empirical justification for this choice, but the relationship between the business cycle and interest rates is not straightforward.

BCI-101 Commercial and industrial loans outstanding (in 1996 $): This series measures the volume of business loans held by banks, and commercial paper issued by nonfinancial companies. The underlying data are compiled by the Federal Reserve. The Conference Board makes price-level adjustments using the same deflator as the money supply component of the leading index. There is a major discontinuity in January 1988, due to a change in the source data; and the composite index calculations are adjusted for this fact. "C & I loans," as this series is commonly called, tend to peak during recessions, when many firms need additional outside funding to replace declining or even negative cash flow. Troughs are typically seen more than a year after the recession ends, as firms are better able to generate profits to internally fund operations and expansion.

BCI-95 Consumer installment credit outstanding to personal income ratio: This series measures the relationship between consumer debt and income. The Federal Reserve compiles and reports the credit data, the BEA provides the personal income data, and all the data are in seasonally adjusted form. This ratio usually shows a trough many months after the recession ends, because consumers tend to initially hold off personal borrowing until personal income has risen substantially. Lags between peaks in the ratio and peaks in the general economy are much more variable.

BCI-120 Change in consumer price index for services: This series measures rates of change in the services component of the consumer price index. It is compiled and reported in seasonally-adjusted percent-change form by the Bureau of Labor Statistics, and is annualized and smoothed in the same six-month averaging fashion as BCI-62 (for the same reason—month-to-month changes are too volatile to show cyclical patterns). Because of what many economists see as recognition lags and other market rigidities, service-sector inflation tends to increase in the initial months of a recession, and to decrease in the initial months of an expansion.

Chart 6: U.S. Composite Indexes



Source: The Conference Board

Table 8: U.S. Business Cycle Expansions and Contractions Post-World-War-II Period

Business Cycle Reference Dates		Duration in Months			
Trough	Peak	Contraction	Expansion	T-T	P-P
October 1945	November 1948	8	37	–	45
October 1949	July 1953	11	45	48	56
May 1954	August 1957	10	39	55	49
April 1958	April 1960	8	24	47	32
February 1961	December 1969	10	106	34	116
November 1970	November 1973	11	36	17	47
March 1975	January 1980	16	58	52	74
July 1980	July 1981	6	12	64	18
November 1982	July 1990	16	2	28	108
March 1991	–	8	–	100	–
Average, 1945-1991 (9 cycles)		11	50	61	61

Sources: National Bureau of Economic Research; The Conference Board

Notes: Based on Table C-51 "*Survey of Current Business*" (U.S. Department of Commerce), October 1994. Reference dates for U.S. business cycles (peak and trough months) are from the National Bureau of Economic Research, a private research group in Cambridge, MA. The NBER developed the business cycle dating procedure, and has determined the official cycle peaks and troughs for more than 50 years. The last reference date, the March 1991 trough, was announced on December 22, 1992 by the NBER's Business Cycle Dating Committee (Robert Hall, chair).

The contraction durations above are for the period starting at the peak of the prior business cycle and ending at the trough date in the same row. The expansion durations are for the period starting at the trough and ending at the peak date in the same row. (The count of months excludes the peak month for contractions and excludes the trough month for expansions.) P-P refers to the full peak to peak cycle, T-T refers to the full trough to trough cycle.

The NBER defines a contraction or recession as a marked period of contraction in many sectors of the economy. The NBER looks for declines in total output, income, employment, and trade, usually lasting from six months to a year, and does not define a contraction in terms of two consecutive quarters of decline in real GDP (as is commonly thought). Also, these traditional business-cycle dates differ from growth-cycle dates, which identify growth recessions as a (recurring) period of slow growth in total output, income, employment, and trade, usually lasting a year or more. A growth recession may encompass a recession, in which case the slowdown usually begins before the recession starts, but ends at about the same time. Slowdowns also may occur without recession, in which case the economy continues to grow, but at a pace significantly below its long-run growth. Finally, a depression is defined as a recession that is major in both scale and duration. Further discussion of these concepts can be found in the NBER book, *Business Cycles, Inflation and Forecasting*, 2nd edition, by Geoffrey H. Moore (Cambridge: Ballinger Publishing Co., 1983).

For additional information on the NBER dating procedures, including a table with peak and trough dates back to the 1800s, see the NBER web site at: www.nber.org/cycles.html, or contact:

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Revisions to the Composite Indexes

Periodic Revisions to the Indexes and Index Methodology

Revisions can be grouped under two categories: comprehensive revisions, and benchmark revisions. Comprehensive revisions affect the composition of the indexes, and are generally undertaken to improve the performance of the indexes. The next part of this section (see below), and the article, *Leading Indicators in Historical Perspective*, by Philip A. Klein, in the third section, discuss such revisions in more detail. Since comprehensive revisions are made in order to improve the performance of the composite indexes, they have a potential to affect index turning points in relation to the business cycles, and change the lead and lag timing of the indexes. In contrast, benchmark revisions are made at the end of every year to bring the indexes up-to-date with recent data revisions. As long as the data revisions and updates are minor, benchmark revisions have only a small impact on the indexes.

Comprehensive Revisions

The last comprehensive revision of the composite indexes of business cycle indicators was in December 1996, when a few adjustments were made to the methodology used to compute all three indexes, and important changes were made to the composition of the leading index to improve its reliability. This revision changed the 1989 list of the components, and is known as the 1996 list of components of the composite indexes. In 1998, The Conference Board reviewed the recent performance of the three composite indexes and, in conjunction with its BCI Advisory Panel, decided there was little or no merit in making changes of this magnitude.

In 2001, The Conference Board is implementing a new procedure that makes the indexes more current in the publication month. It is also eliminating the index standardization, which equalizes the volatility of the leading and lagging indexes to that of the coincident index. Although the components of the indexes remain the same as the 1996 lists, these are significant revisions to the index methodology.

Benchmark Revisions

In mid-December of every year, The Conference Board makes benchmark revisions to the Leading, Coincident, and Lagging Composite Indexes. These revisions bring the indexes up-to-date with their components. The overall effects are minor because their composition—leading, coincident, or lagging indicators included in their respective indexes—are not changed. Most important, the cyclical performance of all three indexes in the current cycle should not be visibly affected by benchmark revisions.

The regular monthly updates to the leading, coincident, and lagging indexes—under normal circumstances between benchmark revisions—incorporate only revisions to data over the past six months. In contrast, benchmark revisions make the contributions from each component current with all available information about the component. The standardization factors that adjust the components to equalize their volatility before they are combined into composite indexes are updated. For example, with the January 2001 release, the standardization factors listed in the previous segment of this section, and calculated over 1959-1999, replaced those used in the year 2000, which were calculated over 1959-1998. Other changes are due to revisions that were made to the historical values of the components over the past year, but previously had not been incorporated into the history of the indexes.

Other Changes in Procedures

Prior to the 2001 revision, if a series had a missing value in a particular month, the standardization factors for the other components were re-normalized to equal one for that month. This is no longer necessary because of the new procedure implemented by The Conference Board. The new procedure allows the calculation of a more timely index by using projected values for series which are not yet available in the publication period, along with the latest values for the stock market index and the yield spread, which are available sooner. The five-step index calculation given above is not changed. Prior to the 2001 revision, every release of the indexes referred to data from one month ago. For example, the indexes released at the beginning of March reported data through the end of January, not through the end of February, as is now the case. (For more information, see "Details on the 2001 Revisions in the Composite Indexes" which follows later in this section, and "Making the Composite Index of Leading Economic Indicators More Timely", at the end of the third section).

Also prior to the 2001 revisions, Step (2) included an additional adjustment factor called the "index standardization factor" applied only to the leading and lagging indexes. The sum of the contributions was multiplied by the index standardization factor in order to equalize the volatility of the leading and lagging indexes to that of the coincident index. (For more information, again see "Details on the 2001 Revisions in the Composite Indexes" in this section).

Prior to the December 1996 revision, the first made by The Conference Board, average absolute changes were used instead of standard deviations to measure the volatility of each component. The remaining procedures follow those developed by the U.S. Department of Commerce before the composite index program was transferred to The Conference Board.

Two additional steps—use of performance-based factors and reverse trend adjustments—were part of the composite index calculations at one time, but were dropped by the U.S. Department of Commerce before The Conference Board's involvement. In 1989, the use of additional and performance-based component weighting factors, which were derived from a cyclical scoring system, was discontinued. In 1993, trend adjustments that equalized the growth rates of the three indexes were discontinued. The Conference Board considered reinstating these steps, but found that the added complications outweighed their benefits.

Details on the 1996 Revisions in the Composite Indexes

The first set of revisions by The Conference Board appeared in 1996, shortly after the transfer. On December 30, 1996, when the November data were first reported, The Conference Board made important changes to the Leading, Coincident, and Lagging Composite Indexes. Most noteworthy were the changes in the composition of the Leading Index.

These changes improved the performance of the composite leading index. Two of the eleven current component series were deleted: change in sensitive materials prices and change in unfilled orders for durable goods. One series was added: interest rate spread, 10-year Treasury bonds less Federal funds rate. Table 9 outlines these revisions in detail. The following is a fuller discussion of the revisions and their effect on the historical cyclical patterns for the composite leading, coincident, and lagging indexes:

The two deletions from the leading index (BCI-92 and BCI-99) were made because these indicators tend to give "false signals" and because reliable replacements could not be found. Moreover, dropping these two series improved the cyclical performance of the leading index in recent years. The added series, the interest rate spread, had become a widely used forecasting variable. It is now regularly reported as a leading indicator in the tables and charts of the *BCI* publication.

Other revisions to the leading indicators were made to reflect changes in data availability and improved statistical practice. These changes, however, had little effect on the cyclical performance of the composite leading index:

(1) Initial claims for unemployment insurance (BCI-05) was based on the seasonally-adjusted, four-week average (centered around the middle of each month) for the total United States and its territories, as reported by the U.S. Department of Labor. Previously, the initial-claims series excluded Puerto Rico, monthly averages were computed by prorating the weekly data series, and a separate set of seasonal adjustment factors was developed specifically for this series. The changes greatly simplified the calculations, but made little practical difference in the behavior of this component, and its contribution to the leading index.

(2) Building permits (BCI-29) were used in millions of new private housing units, which is the same form reported by the Census Bureau. Previously, the permits were converted to an index series. The change removed a minor degree of imprecision due to rounding effects.

(3) Manufacturers' new orders, nondefense capital goods (BCI-27) replaced contracts and orders for plant and equipment (BCI-20). The new orders component constitutes about 90 percent of the contracts-and-orders series. Analysis of the excluded portion—contracts for commercial and industrial building (plant) from a non-government source (F.W. Dodge)—showed that it is considerably more volatile than the BCI-27 series, and is not a reliable leading indicator on its own. Nonetheless, as cyclical indicators, the difference between the two series is relatively small.

(4) Both manufacturers' new orders, consumer goods and materials (BCI-08) and manufacturers' new orders, nondefense capital goods (BCI-27) were converted into constant-dollar terms using chain-weighted deflators from manufacturing shipments data, and reported in millions of dollars. Previously, the deflators were constructed from producer price indexes, and these two series were reported in billions of dollars, with some additional rounding.

(5) Money supply (BCI-106) continued to be based on the Federal Reserve's M2 definition, but was put into constant-dollar terms using the chain-weighted deflator for personal consumption expenditures (PCE). Previously, the M2 deflator was constructed from the consumer price index, and had a base year of 1987.

Four components of the leading index—average weekly hours, vendor performance, stock prices, and index of consumer expectations—were not changed.

The components of the coincident index remained the same, with one minor change: personal income less transfer payments (BCI-51) included an additional adjustment that added the difference between wage accruals and disbursements, using a series that had only recently been computed and reported by the BEA. The new adjustment removed bonus payments that do not follow a regular pattern and thus cannot be directly captured by seasonal adjustment factors. This change smoothed some large spikes in the personal income data that first appeared in 1992. In essence, this revision made the series more closely reflect national income and GDP, because it associated wage payments closer to the period in which they were earned, instead of when they were received.

Table 9: **Components of the leading, coincident, and lagging indexes.**

	Leading Indicators	Changes in 1996
BCI-01	Average weekly hours, manufacturing	none
BCI-05	Average weekly initial claims for unemployment insurance	total U.S., 4-week average
BCI-08	Manufacturers' new orders, consumer goods and materials	92$*
BCI-32	Vendor performance, slower deliveries diffusion index	none
BCI-27	Manufacturers' new orders, nondefense capital goods	replaces BCI-20, 92$
BCI-29	Building permits, new private housing units	in millions
BCI-92	Change in manufacturers' unfilled orders	deleted
BCI-99	Change in sensitive materials prices	deleted
BCI-19	Stock prices, 500 common stocks (S&P)	none
BCI-106	Money supply, M2	92$*
BCI-129	Interest rate spread, 10-year Treasury bonds less Federal funds rate	added
BCI-83	Index of consumer expectations	none
	Coincident Indicators	
BCI-41	Employees on nonagricultural payrolls	none
BCI-51	Personal income less transfer payments	adjusted for accruals
BCI-47	Index of industrial production	none
BCI-57	Manufacturing and trade sales	none
	Lagging Indicators	
BCI-91	Average duration of unemployment	none
BCI-77	Inventories to sales ratio, manufacturing and trade	none
BCI-62	Change in labor cost per unit of output, manufacturing	6-month percent change
BCI-109	Average prime rate charged by banks	none
BCI-101	Commercial and industrial loans outstanding	92$*
BCI-95	Consumer installment credit outstanding to personal income ratio	none
BCI-120	Change in consumer price index for services	6-month percent change

* All deflators were switched to chain-weighted with 1992 as the base year. After the 1999 benchmark revision, the base year was changed to 1996. The fifth section discusses these changes in greater detail.

Source: The Conference Board

Table 10: Timing of the Revised Composite Indexes at Cyclical Turning Points

	Leading Index		Coincident Index		Lagging Index	
	1996 List	1989 List	1996 List	1989 List	1996 List	1989 List
Business Cycle Peaks:						
April 1960	-11	-11	0	-3	3	3
December 1969	-8	-11	-2	-2	3	3
November 1973	-9	-9	0	0	13	13
January 1980	-15	-15	0	0	3	3
July 1981	-3	-8	1	1	2	3
July 1990	-6*	-18	-1	-1	-12	-8
Business Cycle Troughs:						
February 1961	-3	-2	0	0	9	6
November 1970	-7	-1	0	0	15	15
March 1975	-2	-1	0	0	22	21
July 1980	-3	-2	0	0	3	3
November 1982	-8	-10	1	1	6	7
March 1991	-2	-2	0	0	21	36

*-25 for absolute peak in cycle
Note: The numbers refer to months of leads (-) and lags (+).
Sources: National Bureau of Economic Research, The Conference Board

In the lagging index, commercial and industrial loans outstanding (BCI-101) began to use the same chain-weighted PCE deflator as money supply in the leading index. Also, the change in labor costs per unit of output (BCI-62), and the change in the consumer price index for services (BCI-120) were used in the form of annualized percent changes during a six-month span, instead of monthly percent changes that were smoothed using the Canadian filter adjustment.[11] These changes had little effect on the cyclical performance of the two series and the lagging index.

Turning Points in the New Indexes

Table 10 compares turning points for the three composite indexes based on the 1996 list, and the 1989 list. The revised leading index has a shorter lead time for three of the six cyclical peaks since 1959, but a longer lead at four of the six business cycle troughs. For example, the cyclical peak at six months is closer to the economic downturn in 1990 than the 18-month lead from the old version (and a 25-month lead for the new version if the absolute highpoint in the 1983-1996 period were chosen). There are no noteworthy changes in the peak and trough dates for the coincident and lagging indexes.

Conclusion

The preceding explanation of the revision to the composite indexes is aimed at helping readers make the most efficient use of these economic series. As suggested by a comparison of the historical patterns for the leading index, using the 1989 list and the revised 1996 list, the revised version should yield more useful warnings of turning points in the business cycle. Caution is still needed, however, because the improvements are relatively modest, and no single indicator or index is infallible.

11 See Rhoades, Darryl. "A Note on the Design and Application of Minimum Phase-Shift Noise Reducing Filters", *Statistics Canada* (1979). Also, "Converting Timeliness into Reliability in Economic Time Series or Minimum Phase Filtering of Economic Time Series," *Canadian Statistical Review*, 55 (February 1980), pp. vi-xviii.

Details on the 2001 Revisions in the Composite Indexes

The latest revision updates and improves the composite index methodology rather than revising the components of the indexes, as in the 1996 revisions. It affects the reporting of the indexes, enabling The Conference Board to publish the composite indexes approximately two-to-three weeks earlier than was previously possible, and also removes the index standardization factor (note that this was an additional adjustment, independent of the component standardization factors), and thus simplifies the calculation procedure, making movements in the leading and lagging indexes visually more pronounced.

Making the Indexes More Timely

To address the problem of lags in available data, those indicators that are not available at the time of publication are projected using statistical imputation. An autoregressive model is used to estimate each component that is missing in the publication period. The indexes are then constructed using a combination of real and projected data. They are revised, as the data unavailable at the time of publication become available. The main advantage of this procedure is to utilize in the leading index the data that are available earlier than other data, such as stock prices, new orders, and changes in inventory. Conference Board research suggests that there are real gains in adopting this procedure to make all the indicator series as up-to-date as possible, even though it adds another source of revisions. However, such revisions are treated as part of the monthly data revisions, now a regular part of indicator programs. (See "How to Make the Composite Index of Leading Economic Indicators More Timely," in the third section.)

The main idea behind the more timely leading index is that it should incorporate the most recent available values for stock prices and the yield spread, and good, cost-effective estimates of the remaining components in the publication period. Thus, instead of the old index, which, for example, reports November values in the first week of January, we have a new index, which reports November values by mid-December.

Index Standardization Factors

Prior to 2001, The Conference Board composite index methodology included a step that equalized the volatility of the three indexes by multiplying the sum of the component contributions by a standardization factor that made the average historical monthly volatility of the Leading Index equal to that of the Coincident Index. This standardization factor was calculated as the ratio of the standard deviation of the monthly percent changes of the Coincident Index to the standard deviation of the monthly percent changes of the unadjusted Leading Index. The Lagging Index was standardized similarly.

The original purpose of this standardization process was to simplify comparisons of monthly changes in the three composite indexes. In a standardized index, any monthly change that exceeded 1.0 percent was an above-average change, and thus carried some significance. Also, when they were charted together, the volatility of all three standardized indexes were identical. The standardization process, therefore, added some consistency to the composite cyclical indexes, and facilitated analysis of them.

These properties, however, have turned out to be unimportant. Month-to-month changes in the indexes have always been too volatile to

have significant analytical content, and thus no one pays much attention to one-month changes in and of themselves. Business cycle forecasters, instead, focus mainly on movements in the indexes across 3, 6, or 9 month periods (econometric models do so as well, incidentally, and for the same reason). Standardization of month-to-month changes in the indexes affects those somewhat longer movements hardly at all, and thus is not particularly helpful to analysts.

Effect of the Change

The accompanying charts, which compare the indexes with and without standardization, demonstrate this clearly. Chart 7 shows that the standardization process slightly changes the long-term trend of the Leading Index while the cyclical patterns remain the same.

Moreover, the months at which the two series reach cyclical peaks and troughs are identical. In other words, the length of leads at cyclical turning points remain unchanged. While month-to-month movements in the unadjusted composite indexes are more pronounced, the correlations between the Coincident Index and each version of the Leading Index remain virtually identical. Most telling, as you look at this chart, nowhere can you find a time across these four decades of business cycle history where your forecast would differ depending on which of these two series you relied upon.

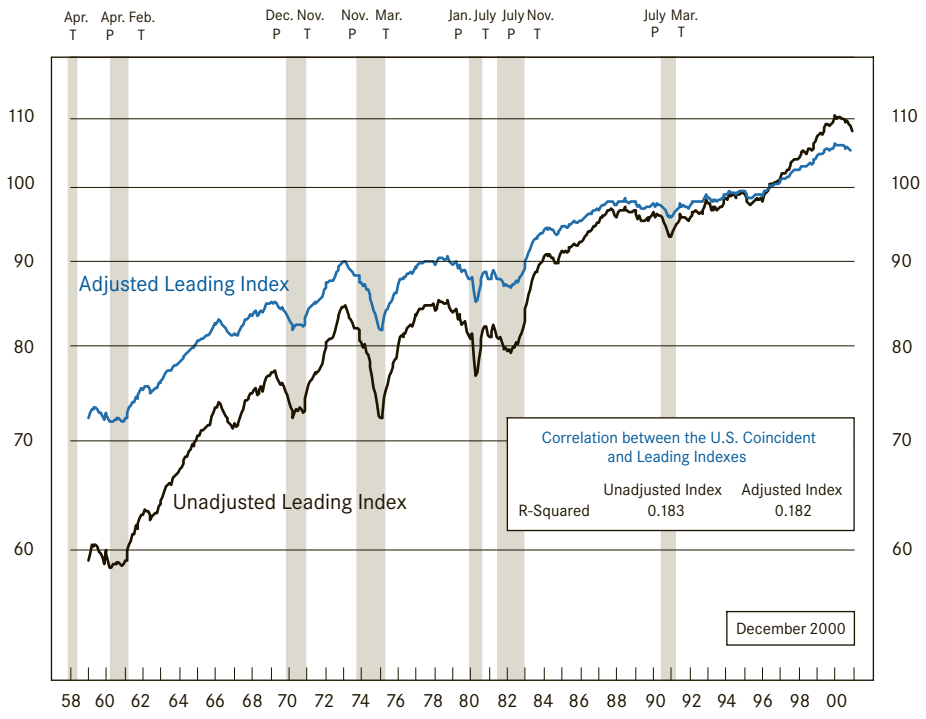
Chart 8 makes the same comparison for the Lagging Index, which has even smaller differences than those described for Chart 7. Again, the peak and trough dates are identical, as well as the correlations between the Coincident Index and the ratio. Here, too, the standardization process amounts to a scale adjustment that has almost no impact analytically.

It should also be noted that this revised methodology conforms to the procedures adopted by The Conference Board for its international indexes, makes the index more transparent, and improves the graphic presentation.

Summing Up

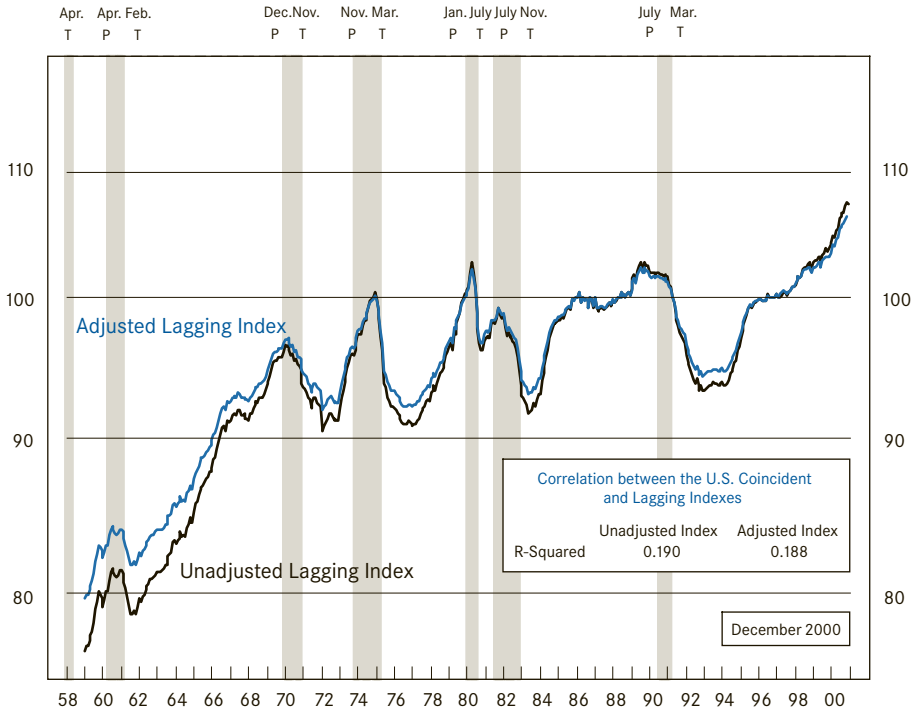
Standardizing the month-to-month changes in the cyclical indexes does not make a meaningful difference to their analytical value. It should, however, be emphasized that the month-to-month changes in the standardized Leading and Lagging Indexes prior to December 2000, are not comparable to changes in the unstandardized indexes beginning in January, 2001. For the same reason, the month-to-month variance in the Coincident Index is no longer comparable with the monthly variance of the unstandardized Leading and Lagging Indexes. This index standardization factor did not hurt the indexes, but neither did it help, at least not significantly enough for it to count. Accordingly, beginning January 2001, The Conference Board began publishing the Leading and Lagging Indexes without standardizing the month-to-month changes.

Chart 7: U.S. Leading Index: The Effect of Removing the Index Standardization Factor



Source: The Conference Board

Chart 8: U.S. Lagging Index: The Effect of Removing the Index Standardization Factor



Source: The Conference Board

V. Data Series Descriptions

BEA Comprehensive Revisions

Anne D. Picker
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Introduction

The Bureau of Economic Analysis has just completed its first comprehensive revision of the National Income and Product Accounts since the introduction of chain-weighted accounts in 1996. BEA has redefined some accounts, transferred others to more appropriate categories, and moved the base year from 1992 to 1996. The article below focuses on the major changes, and highlights where the major impacts occur.

The changes can be classified in three ways:

- Those that have a direct effect on the total gross domestic product (GDP)–changing the value of gross domestic product by adding a new component.
- Those that change internal balances but have no effect on total GDP–changes to individual accounts that are offset by changes to other accounts.
- Rebenchmarking–a change to the reference base year.

With the exception of the introduction of software to fixed investment, the other changes have little or no effect on total gross domestic product or on gross domestic income (GDI) after 1994. However, the reclassifications of government pensions and of capital transfers significantly affect the estimates of personal saving and of the government current surplus or deficit. The modification of private noninsured pension plans affects corporate profit and net interest estimates significantly.

BEA made the following changes in definitions and classifications. Only the first affects the level and rate of GDP growth:

- Included software expenditures by business and government in fixed investment.
- Changed the treatment of government employee retirement plans, which are now included in personal savings.
- Modified the treatment of private noninsured pension plans.
- Reclassified certain transactions as capital transfers.
- Redefined dividend payments by regulated investment companies (mutual funds) to exclude distributions that reflect capital gains income.
- Redefined the value of imputed services of regulated investment companies.
- Reclassified several government tax and transfer programs.
- Reclassified as financial transactions the implicit subsidies associated with Federal direct loan housing programs.
- Reclassified directors' fees.

Rebenchmarking

Periodically, the base year or reference period is changed. The reference year for calculating quantity and price indexes, and for chain dollar estimates, has been shifted to 1996 from 1992. Estimates of growth and inflation are not affected by this change. In the past, when the reference period was shifted and fixed rates were used, the numbers would change because of the shift in the base period. That no longer occurs using chain methodology. The reference period was changed so that the dollar numbers in the current period are more nearly additive. There are many reasons why dollar numbers are still needed in addition to working with chain values. Many people still prefer to work with dollar numbers. By having dollar numbers, various per capita measures, such as GDP per capita and real disposable personal income, can be calculated.

Inclusion of Software in Fixed Investment

The most important change in [the] revisions is that business and government expenditures for software are now part of fixed investment. Software produces a flow of services that lasts more than one year, to be considered as fixed investment. Previously, only estimates of embedded or bundled software were included in fixed investment, but business and government software purchases were excluded. The change recognizes the importance of software in the economy.

GDP is increased by business purchases and own-account production of software; by government enterprises purchases and own- account production of software; and by the depreciation or consumption of fixed capital (CFC) on general government purchases and own-account production of software. For general government, the depreciation represents a partial measure of the services of the stock of government software.

Business purchases of software are added to fixed investment and to GDP. Previously, these purchases were treated as intermediate inputs, and were omitted from the calculations. Business own-account software production, measured as the sum of the production costs, is added to fixed investment and to GDP.

The inclusion of software purchases in investment affects the business incomes and private consumption of fixed capital components (depreciation) of gross domestic income (GDI). Business incomes (proprietors' income and corporate profits) are increased because of the elimination of deductions for purchases of software, and by the addition of the value of the production of own-account software as a receipt. These effects are partly offset by the deduction of the CFC on both purchased software and own-account software production.

Other impacts include:

- National income and product account–Within GDI, proprietors' income, corporate profits, and the current surplus of government enterprises increase for most periods because the elimination of deductions for purchased software and the addition of the value of own-account software as a receipt are expected to exceed the deduction of software consumption of fixed capital. The depreciation of GDI increases to reflect the addition of the software depreciation.
- Personal income and outlay account–Personal income and personal saving increase for most periods by the amount of the change in proprietors' income.
- Government receipts and expenditures account–Government consumption expenditures decrease for most periods by the sum of the amounts of general government purchased software and of general government own-account compensation and other production costs, less the amount of general government software CFC. The current surplus of government enterprises is increased by the sum of the amounts of government enterprises purchased software, and of government enterprises own-account compensation and other production costs, less the amount of government enterprises software CFC. The government current surplus or deficit increases for most periods by the amounts of the change in government consumption expenditures, and the change in the current surplus of government enterprises.
- Foreign transactions account–Receipts from the rest of the world and payments to the rest of the world are not affected.
- Gross saving and investment–Personal saving, undistributed corporate profits, CFC, the government current surplus or deficit, gross private domestic investment, and gross government investment change. Gross saving and gross investment increase by the same amount as the sum of the changes in gross private domestic investment and in gross government investment.

Government Employee Retirement Plans

Government employee retirement plans now are treated the same as private pension plans and are no longer classified as social insurance funds within the government sector. Federal civilian, Federal military, and state and local government retirement plans are included and are treated like private pension plans. The change, which is carried back to 1929, does not affect GDP, GDI, or national saving, but it increases personal saving and decreases government saving by offsetting amounts.

Impact:

- National income and product–GDP and national income are not affected. However, within GDP, government consumption expenditures decrease and personal consumption expenditures increase by the amount of the reclassified administrative expenses. Within national income, other labor income increases and employer contributions for social insurance decrease by the amount of the reclassification of employer contributions.
- Personal income and outlay–Personal income rises by the amounts of employer and personal contributions, dividends received, and interest received, and falls by the amount of transfer payments to persons. Personal outlays increase by the amounts of the reclassification of administrative expenses (affecting PCE) and of the reclassification of transfer payments to the rest of the world (net). Personal saving goes up by the amount of the difference between the increase in personal income and the increase in personal outlays.
- Government receipts and expenditures–Government receipts decrease by the amounts of employer and personal contributions. Government current expenditures decrease by the amounts of reclassified administrative expenses (in consumption expenditures) and benefits paid (in transfer payments), and increases by the amounts of interest and dividends received. The government current surplus or deficit decreases by the amount of reclassified saving associated with the plans.
- Foreign transactions–Receipts and payments to the rest of the world are not affected. An increase in transfer payments to the rest of the world from persons (net) is offset by a decrease in transfer payments to the rest of the world from government (net).
- Gross saving and investment account–Gross investment and gross saving are not affected. An increase in personal saving is offset by a decrease in the government current surplus or deficit.

Other Changes

The changes listed in the following section have no impact on the level or growth of gross domestic product, but do have an impact on internal account balances. Since NIPA bookkeeping is a double entry system, what is added to one account by definition has been subtracted from another.

- **Private Noninsured Pension Plans**

  The treatment of noninsured pension plans has been modified as it relates to the measurement of corporate profits and to the recording of property income, that is, rent, dividends, and interest. The corporate profits that are associated with the plans are recorded as zero, and the property income is recorded as being received directly by persons in the corresponding components of personal income.

  The change increases profits, rental income of persons, and personal dividend income, and decreases net interest, and personal interest income. Rental income and dividend income increases now are offset by the decrease in personal interest income. GDP, national income, personal income, personal saving, and business saving are not affected.

- **Capital Transfers**

  Certain transactions, which mainly represent transfers of existing assets, and so do not affect the level of disposable income in the current period, have been reclassified as capital transfers. As a result, these transactions have been removed from NIPA. This reclassification, which has been carried back to 1929, does not affect GDP, but does affect national saving.

- **Dividend Distributions of Regulated Investment Companies**

  As part of the 1998 annual NIPA revision, dividend payments were redefined to exclude the distributions of mutual funds that reflect capital gains income. The estimates now have been revised back to 1946. This change does not affect the dividend payments of mutual funds and the aggregates that include them. Personal income and personal saving decrease, and undistributed corporate profits increase, by the amount of the capital gains distributions that are excluded. GDP, GDI, corporate profits, and gross saving are not affected.

- **Imputed Services of Regulated Investment Companies**

  The value of the imputed services of mutual funds is redefined to equal operating expenses.

  The value of mutual funds had been defined as net property income received. This redefinition, which is carried back to 1959, affects GDP and GDI, but not national saving.

- **Government Taxes and Transfer Programs**

  Several Federal tax items and state and local contributions and transfer items were reclassified. None affect GDP; except for a reclassification of certain excise taxes, GDI and national saving are not affected.

  Refunds under the Federal Insurance Contribution Act (FICA) have been reclassified as negative contributions for social insurance. Currently, FICA refunds are treated as offsets to personal income taxes. As a result of this change, the treatment of FICA refunds is consistent with the present treatment of FICA payments, which are treated as contributions for social insurance. The change, which has been carried back to 1938, increases nonwithheld income taxes, and decreases contributions for social insurance by the amounts of the FICA refunds. Federal receipts and the current surplus or deficit are not affected.

  Excise taxes related to private pension plans, such as taxes on pension-plan "reversions," have been reclassified as business nontaxes. This change recognizes that these excise taxes are more like fees than like conventional taxes, and that the employer pays them. The change decreases personal nonwithheld income taxes, and increases business nontaxes by the amounts of these excise taxes. GDI and the statistical discrepancy are affected. The increase in business has not been offset in corporate profits, because excise taxes are already deducted in the source data used to estimate corporate profits. Federal receipts and the current surplus or deficit are not affected. Disposable personal income and personal saving increase.

- **Implicit Subsidies Associated With Federal Direct Loan Housing Programs**

  Implicit subsidy payments and offsetting interest payments that are associated with Federal direct loan housing programs have been reclassified as financial transactions back to 1968 and, as such, they are no longer included in NIPA. The change is consistent with the treatment of interest subsidy costs of other direct loan credit programs. These costs are classified as financial transactions, and thus are excluded from NIPA because transactions in financial assets represent the exchange of existing assets rather than current income or production.

- **Directors' Fees**

  The fees paid to outside directors are reclassified from other labor income to nonfarm proprietors' income. This reclassification does not affect GDP but, because it eliminates a double counting of these fees in NIPA that began in 1979, it affects GDI, the statistical discrepancy, and national saving, beginning with 1979.

Composite Indexes of Leading, Coincident, and Lagging Indicators

BCI-910 (G0M910) **Composite Index of 10 Leading Indicators** (1996=100)

BCI-920 (G0M920) **Composite Index of 4 Coincident Indicators** (1996=100)

BCI-930 (G0M930) **Composite Index of 7 Lagging Indicators** (1996=100)

BCI-940 (G0M940) **Ratio, Coincident Index to Lagging Index**

BCI-950 (D1M950) **Diffusion Index of 10 Leading Indicator Components**

BCI-951 (D1M951) **Diffusion Index of 4 Coincident Indicator Components**

BCI-952 (D1M952) **Diffusion Index of 7 Lagging Indicator Components**

Source: TCB

OVERVIEW

The composite indexes of leading, coincident, and lagging indicators are summary statistics for the United States economy. They are key elements in an analytic system designed to signal peaks and troughs in the business cycle and are essentially composite averages of between four and ten individual series. They are constructed to summarize and reveal common turning point patterns in economic data in a clearer and more convincing manner than any individual component (primarily because they smooth out some of the volatility of individual components).

Historically, cyclical turning points in the leading index have occurred before those in aggregate economic activity; cyclical turning points in the coincident index have occurred at about the same time as those in aggregate economic activity; and cyclical turning points in the lagging index generally have occurred after those in aggregate economic activity.

TECHNICAL NOTES

The composite index methodology is described in Section IV of this *Handbook*, which also includes information on major revisions by The Conference Board (December 1996, and January 2001), and the annual, historical benchmarking process.

The three composite indexes implicitly include seasonal adjustments in the sense that all data series that show predictable seasonal variations are seasonally adjusted by the source agencies.

Percent changes for each index are calculated and reported after rounding to one digit over both one- and six-month spans, and the latter value is expressed as an annual rate. In the BCI database, the percent change for this longer span is centered or placed in the fourth month of the span. For example, the January to July period covers six monthly intervals, and the associated, annualized percent change is placed in April. Also, percent changes in composite indexes do not always equal the sum of the reported contributions from each component because of rounding effects and base value differences.

Diffusion indexes, which measure the proportion of components that are rising, are calculated as follows: Components that rise more than 0.05 percent are given a value of 1.0. Components that change less than 0.05 percent are given a value of 0.5, and components that fall more than 0.05 percent are given a value of 0.0. The denominator in the diffusion index calculation is the number of components in the month or span.

SOURCE AGENCY

The Conference Board, through its monthly news release: *U.S. Leading Economic Indicators and Related Composite Indexes*, is the direct source for the composite leading, coincident, and lagging indexes (plus related series). Series begin in 1959.

Components of Composite Indexes

		Leading Index Components:	Method of Calculation*:
1.	BCI-01	Average weekly hours, manufacturing	Symmetric percent
2.	BCI-05	Average weekly initial claims for unemployment insurance	Symmetric percent
3.	BCI-08	Manufacturers' new orders, consumer goods and materials	Symmetric percent
4.	BCI-32	Vendor performance, slower deliveries diffusion index	Symmetric percent
5.	BCI-27	Manufacturers' new orders, nondefense capital goods	Symmetric percent
6.	BCI-29	Building permits, new private housing units	Symmetric percent
7.	BCI-19	Stock prices, 500 common stocks	Symmetric percent
8.	BCI-106	Money supply, M2	Symmetric percent
9.	BCI-129	Interest rate spread, 10-year Treasury bonds less Federal funds	Arithmetic change
10.	BCI-83	Index of consumer expectations	Symmetric percent

		Coincident Index Components:	
1.	BCI-41	Employees on nonagricultural payrolls	Symmetric percent
2.	BCI-51	Personal income less transfer payments	Symmetric percent
3.	BCI-47	Industrial production	Symmetric percent
4.	BCI-57	Manufacturing and trade sales	Symmetric percent

		Lagging Index Components:	
1.	BCI-91	Average duration of unemployment	Symmetric percent
2.	BCI-77	Inventories to sales ratio, manufacturing and trade	Symmetric percent
3.	BCI-62	Labor cost per unit of output, manufacturing	Arithmetic change
4.	BCI-109	Average prime rate	Arithmetic change
5.	BCI-101	Commercial and industrial loans	Symmetric percent
6.	BCI-95	Consumer installment credit to personal income ratio	Symmetric percent
7.	BCI-120	Consumer price index for services	Arithmetic change

*Symmetric percent: $200*(X_t-X_{t-1})/(X_t+X_{t-1})$ denominator in calculation is essentially the average of the current and prior value.

TECHNICAL NOTES

The table above lists the components of the three composite indexes. A short description of each component, including economic reasoning that supports its use, is provided in Section IV. Further detail on these components and their related series appears in this section.

The contribution from each component is based on either symmetric percentages or arithmetic differences, as noted in the table. The methodology for calculating the contributions for each component and constructing the composite indexes is provided in Section IV of this *Handbook*.

Employment, Unemployment, and Other Labor Force Related Series

A. Labor Force, Unemployment, and Employment (Households, Current Population Survey)

OVERVIEW

Employment, unemployment, and other labor force related data are collected from a sample of U.S. households using both in person (face-to-face) and telephone interviews. The questions in the survey are primarily designed to determine the level and specific details about the active labor force, counting both employed and unemployed individuals.

The national unemployment rate (BCI-43) typically receives the greatest attention among these economic indicators.

TECHNICAL NOTES

These series are based on data collected in household surveys conducted each month by interviewers of the U.S. Department of Commerce's Bureau of the Census as part of its "Current Population Survey." They are compiled for the Bureau of Labor Statistics (BLS). The information is collected by trained interviewers from a sample of about 50,000 households located in about 750 sample areas. (Beginning with January 1996 data, the number of households and areas covered has varied over time.) These areas are chosen to represent all counties and independent cities in the United States (50 states and the District of Columbia). The data collected are based on the activity or status reported for the calendar week including the 12th of the month. This week is known as the CES (Current Employment Statistics) reference week.

An important concept in the survey is the target population: the civilian noninstitutional population 16 years of age. The primary goal of the survey is to determine the portion of this total population and certain subgoups (sex, age, and race classifications) that are currently employed, unemployed, and actively seeking employment, or out of the labor force. Civilian noninstitutional population excludes members of the U.S. Armed Forces, and persons in penal institutions, mental institutions, and homes for the aged, infirm, and needy.

Many of these series are published in both seasonally adjusted and unadjusted form. Seasonally adjusted data are usually preferred for general analysis because they are designed to eliminate the effect of changes that occur at about the same time and with similar magnitude each year. Seasonally adjusted figures for most of the aggregate series are obtained by summing independently adjusted employment and unemployment components. Seasonal adjustment factors change annually.

SOURCE AGENCY

Bureau of Labor Statistics. Most series begin in 1947 or 1948.

BCI-441 (A0M441)
Source – BLS

Civilian Labor Force

Thousands of Persons, SA

The civilian labor force includes persons 16 years old or over in the civilian noninstitutional population who are classified as employed or unemployed. Civilian noninstitutional population excludes members of the U.S. Armed Forces, and persons in penal institutions, mental institutions, and homes for the aged, infirm, and needy.

BCI-450 (A0M450)
BCI-451 (A0M451)
BCI-452 (A0M452)
BCI-453 (A0M453)
Source – BLS

Labor Force Participation Rate
Labor Force Participation Rate, Males 20 and Over
Labor Force Participation Rate, Females 20 and Over
Labor Force Participation Rate, 16-19 Years of Age

Percent, SA

Labor force participation rates measure the proportion of the population for a demographic group that is in the labor force (classified as either employed or unemployed). Participation rates for the total work-age population, both sexes 16 years and over, males 20 years and over, females 20 years and over, and both sexes 16-19 years of age are in the *BCI*.

TECHNICAL NOTES

The participation rates are calculated as percentages of components of BLS estimates for the total civilian labor force to comparable estimates of the civilian noninstitutional population (based on estimates developed by the Census Bureau).

BCI-442 (A0M442)
Source – BLS

Civilian Employment

Thousands of Persons, SA

This national, aggregate employment series measures civilian, noninstitutional persons 16 years old or over who worked during any part of the reference week. It includes paid employees; those who worked in their own business, profession, or farm; or who worked 15 hours or more as unpaid workers in a family-owned enterprise.

TECHNICAL NOTES

Also included are those who were not working but had jobs or businesses from which they were temporarily absent due to illness, bad weather, vacation, labor-management disputes, or personal reasons (whether or not they were paid by their employers for the time off, and whether or not they were seeking another job).

Each employed person is counted only once. Those who had more than one job are counted in the job at which they worked the greatest number of hours during the survey week. The data include citizens of foreign countries who are living in the United States but not on the premises of an embassy. They exclude persons whose only activity consisted of work around their own homes (such as housework, painting, repairing, etc.) and volunteer workers for religious, charitable, and similar organizations.

BCI-90 (A0M090)
Source – BLS

Ratio, Civilian Employment to Working-Age Population

Percent, SA

This series expresses civilian employment (BCI-442) as a percent of civilian noninstitutional population 16 years and over.

BCI-37 (A0M037)
Source – BLS

Number of Persons Unemployed

Thousands of Persons, SA

This measure of unemployment includes persons who did not work during the reference week, but were available for work and made specific efforts to find a job (except for temporary illness) within the previous four weeks. Examples of job search methods that result in a person being counted as unemployed include going to an unemployment service, applying directly to an employer, answering a want ad, or participating in a union or professional register. Persons who were waiting to be called back to a job from which they had been laid off are also are classified as unemployed.

BCI-43 (A0M043)
Source – BLS

Civilian Unemployment Rate

Percent, SA

The civilian unemployment rate is the ratio of the number of persons unemployed (BCI-37) expressed as a percent of the civilian labor force (BCI-441). This series is inversely related to broad movements in aggregate economic activity and is one of the most widely reported and analyzed statistics from the household employment survey.

BCI-44 (A0M044)
Source – BLS, TCB

Unemployment Rate, 15 Weeks and Over

Percent, SA

This series measures the ratio of the number of persons who have been unemployed for 15 weeks or more expressed as a percent of the civilian labor force (BCI-441).

BCI-91 (A0M091)
Source – BLS

Average Duration of Unemployment in Weeks

Weeks, SA

The average duration of unemployment measures the average number of weeks, including the survey's reference week, during which persons classified as unemployed had been looking for work or, in the case of persons on layoff, the number of weeks since their layoff.

TECHNICAL NOTES
Average duration of unemployment is the arithmetic mean computed from the distribution by weeks of unemployment.

BCI-42 (A0M042)
Source – BLS

Persons Engaged in Nonagricultural Activities

Thousands of Persons, SA

This national employment series is a component of total civilian employment (BCI-442) and measures the number of persons employed in all activities except agriculture.

B. Employment and Hours (Establishments, Current Employment Statistics)

OVERVIEW

Relying primarily on payroll records, the Bureau of Labor Statistics (BLS) estimates on a monthly basis, employment, hours, and earnings for the nation as a whole, as well as individual states and major metropolitan areas. The definition of employment is quite inclusive, and workers may be double-counted if they work for more than one establishment. However, agricultural and most domestic workers, self-employed, military personnel, and unpaid volunteers are excluded from the data. Adjustments are made to account for small businesses that are not required to file monthly payroll reports, and for other types of nonsampling errors in the survey.

TECHNICAL NOTES

Changes in Employees on Nonagricultural Payrolls (BCI-41) typically receive the greatest attention among these economic indicators. Extensive employment and hours data are collected each month by the Current Employment Statistics (CES) program using payroll records from a large, nationwide survey of private establishments and government agencies. The CES is a federal-state cooperative program; it is conducted by state employment security agencies in cooperation with the BLS. The sample includes nearly 400,000 establishments, employing about one third of all payroll workers. Establishments are defined as economic units–such as a factory, mine, store, or nonprofit organization–that produce goods or services.

Generally, the CES data cover the payroll period that includes the 12th of the month. There are a few exceptions for federal government data, which represent positions occupied on the last day of the month. Full-time, part-time, temporary, and permanent workers are all counted as employed, as are workers who are on paid leave (such as sick, holiday, or vacation) and persons who worked during any part of the pay period. Persons on the payroll of more than one establishment are counted each time they are reported. Persons on a nonpay status for the entire period due to layoff, strike, or leave without pay are excluded. Also excluded are proprietors and the self-employed; unpaid volunteers; farm and other agricultural workers; domestic and family workers; and noncivilian government workers.

National estimates of hours and earnings for production workers in the goods-producing industries and nonsupervisory workers in the service-producing industries are made only for the private sector, with the BLS providing detail for about 500 private industries as well as for overtime hours in manufacturing. (In fact, much of the CES data concentrate production or "factory" workers, especially the various measures for hours and earnings.) Total hours differs from the concept of scheduled hours worked, reflecting numerous factors such as unpaid absenteeism, labor turnover, part-time work, strikes, and fluctuations in work schedules for economic reasons. Overtime hours are defined as hours worked in excess of the number of straight-time hours in a workday or workweek and for which overtime premiums are paid.

Comparing the CPS "Household" and CES "Payroll" Employment Data

The BLS reports the CPS-based, "household" employment in conjunction with the CES-based, "payroll" employment data. Although the two types of data differ in underlying sources, coverage, content, and other details, long- and medium-run trends in total employment derived from each survey are generally consistent with each other. Month-to-month changes can differ substantially, however, for a variety of reasons, including differences in seasonal adjustment methods, sampling errors, and unexpected biases between regular benchmark revisions in the data.

> "The payroll survey excludes unpaid family workers, domestic workers in private homes, proprietors, and other self-employed persons, all of whom are is employed by two or more establishments at each place of employment, but the household survey counts a person only once, and classifies him or her according to the major activity. Certain persons on unpaid leave for the entire reference period are counted as employed under the household survey but are not included in the employment count derived from the payroll survey. Over time, however, the two surveys show similar trends in employment. The household survey emphasizes the employment status of individuals and also provides much information on the demographic characteristics (sex, age, race) of the labor force. The survey is not well suited to furnishing detailed information on the industrial and geographic distribution of employment. The establishment survey provides limited information on personal characteristics of workers; however, it is an excellent source for detailed industrial and geographic data. In addition, it provides hours and earnings information which relates directly to the employment figures. The payroll and household surveys thus complement each other."

Source: BLS Handbook of Methods (U.S. Department of Labor, Bureau of Labor Statistics, 1997), p. 25.

Most CES-based data show substantial seasonal patterns. All are available on a not seasonally adjusted basis, and the most commonly used and studied data are available on a seasonally adjusted basis. The seasonally adjusted figures for all aggregate series are generally obtained by summing independently adjusted components.

It is also important to know that the BLS does not use a "sum of states" concept to compile the national employment series. The national series are developed independently of the state estimation procedures, which are only designed to produce accurate data for each individual state. The BLS does not force state estimates to sum to national totals (or vice versa.) In fact, the BLS cautions against summing the individual state employment series, because each is subject to larger sampling and nonsampling errors than the national series, and summing cumulates individual errors in a manner that can cause significant distortions at an aggregate level.

SOURCE AGENCY

Bureau of Labor Statistics. Most series begin in 1947 or 1948.

BCI-1 (A0M001)
Source – BLS

Average Weekly Hours, Manufacturing

Hours, SA

This hours-worked series for the manufacturing sector measures the average number of hours paid per worker (per week during the survey week) engaged only in production or factory-type work. The average includes overtime work (see BCI-21 below).

TECHNICAL NOTES

Production workers include working supervisors and nonsupervisory workers (including group leaders and trainees) engaged in fabricating, processing, assembling, inspecting, receiving, storing, handling, packing, warehousing, shipping, trucking, and hauling of merchandise. It also includes those workers in maintenance, repair, janitorial, guard services, product development, auxiliary production for the plant's own use (e.g., power plant), record keeping, and other services closely associated with production operations.

BCI-21 (A0M021)
Source – BLS

Average Weekly Overtime Hours, Manufacturing

Hours, SA

This hours-worked series for the manufacturing sector measures the average number of hours that are in excess of regular hours (per week during the survey week) and for which overtime premiums are paid.

TECHNICAL NOTES

Overtime hours are those for which production workers receive overtime compensation because their hours are in excess of the straight-time workday or workweek during the survey period. Weekend and holiday hours are included only if overtime premiums are paid. Hours for which only shift differential, hazard, incentive, or other similar types of premiums are paid are excluded.

BCI-40 (A0M040)
Source – BLS

Nonagricultural Employees, Goods-Producing Industries

Thousands of Persons, SA

This series measures the number of persons employed in mining, manufacturing, and construction industries.

BCI-41 (A0M041)
Source – BLS

Employees on Nonagricultural Payrolls

Thousands of Persons, SA

This series measures the number of persons employed in establishments engaged in goods production (see BCI-40), transportation and public utilities; wholesale and retail trade; finance, insurance, and real estate; services; and government. Employees under Central Intelligence Agency (CIA), National Security Agency (NSA), Defence Intelligence Agency (DIA), and National Imagery and Mapping Agency are excluded due to security reasons.

BCI-963
(D1M963)
(D6M963)
Source–BLS

Employees on Nonagricultural Payrolls, 356 Industries
Diffusion Index, one-month span
Diffusion Index, six-month span

Percent, SA

This diffusion index for private nonagricultural payroll employment measures the percent of industries with increasing employment plus one-half of the industries with unchanged employment. A value greater than 50 percent indicates that over half of the mix of industries had employment increases.

TECHNICAL NOTES

Beginning in 1989, BCI-963 is calculated from 356 unpublished three-digit SIC employment series, which cover nonagricultural payroll employment in the private sector. Prior to 1989, the index was based on 349 three-digit industries which are not strictly comparable because of coverage differences associated with the 1987 SIC revision. In the BCI database, the six-month version of BCI-963 is centered to lie in the fourth month of the six-month span. Both diffusion indexes are seasonally adjusted in the sense that a majority of the underlying components are seasonally-adjusted series.

BCI-570 (U0M570)
Source – BLS, TCB

Employment, Defense Dependent Industries

Thousands of Persons, NSA

This series measures employment engaged in the production of defense or military goods, plus a significant amount of employment that is nondefense related, but is at establishments that are classified as part of the defense products industries. It does not include employment that produces goods and services in industries that support defense activities but are not primarily defense dependent.

TECHNICAL NOTES

BCI-570 is not published monthly in the regular establishment employment report, but is an official BLS series made available upon request. (At one time BCI-570 was compiled and seasonally adjusted by BEA using BLS data.) The defense group includes ordnance and accessories (SIC 348), aircraft and parts (SIC 372), shipbuilding and repairing (SIC 3731), guided missiles and space vehicles (SIC 376), tanks and tank components (SIC 3795), and search and navigation equipment (SIC 381). These industries were identified for the BLS series as defense-dependent at a low level of aggregation (i.e., four-digit SIC). An entire three-digit industry is included only if at least 50 percent of the output in each of the four-digit components output was for defense purchases in 1987 (the peak year for defense expenditures).

C. Claims for Unemployment Insurance

OVERVIEW

Initial claims for unemployment insurance measures the number of persons who file first claims (per week) for unemployment compensation under an unemployment insurance program in the 50 states and the District of Columbia, Puerto Rico, and the U.S. Virgin Islands.

Insured unemployment measures the number of persons reporting at least one week of unemployment. It includes some persons who are working part-time and would be counted as employed in the payroll and household surveys. It excludes persons who have exhausted their benefit rights and workers who have not earned rights to unemployment insurance. The number of individuals covered by unemployment insurance and the eligibility of an individual to receive unemployment insurance payments is determined by separately administered state-run agencies that follow guidelines established by federal statute.

TECHNICAL NOTES

The federal-state unemployment insurance system was initiated in the Social Security Act of 1935 and is designed to offer the first economic line of defense against the effects of unemployment. Conceptually, unemployment compensation is designed to provide benefits to most workers out of work due to no fault of their own, ensuring that a significant proportion of the necessities of life (food, shelter, and clothing) can be obtained while a search for work takes place. Except in a few states where there are small employee payments, the system is financed by a payroll tax on employers. Who is eligible, the amount they receive, and the length of time benefits are paid are largely state-specific, within minimum guidelines established by federal statute. Most states now pay a maximum of 26 weeks; a few, longer.

At present, state unemployment insurance programs cover approximately 97 percent of wage and salary workers. The self-employed, workers on small farms, and some workers in nonprofit organizations and domestic services, are excluded from these programs.

A covered worker, upon becoming unemployed, files an initial claim to establish the starting date for any unemployment compensation that may result from unemployment for one week or longer at a local, state-run agency. The aggregate data are compiled by the U.S. Department of Labor's Employment and Training Administration (ETA) from weekly reports of the employment security agencies in the 50 states, Puerto Rico, the U.S. Virgin Islands, and the District of Columbia.

The insured unemployment figure is derived by adjusting the data for the number of weeks of unemployment and the time the claim is filed, so that the series reflects the week in which unemployment actually occurred. Monthly values are four-week averages, using the four-week period that best spans the month.

The Conference Board seasonally adjusts the series using seasonal factors supplied by the U.S. Department of Labor.

SOURCE AGENCY

U.S. Department of Labor. Series begin in 1945.

BCI-5 (A0M005)
Source – DOL, TCB

Average Weekly Initial Claims for Unemployment Insurance

Thousands of Persons per Week, SA

This series measures the average number of persons who file first claims for unemployment compensation per week in a given month.

BCI-45 (A0M045)
Source – DOL, TCB

Average Weekly Unemployment Insurance Rate

Percent, SA

This series measures the number of individuals that are receiving unemployment insurance, expressed as a percent of the average covered employment. The numerator is a "stock" value that compliments BCI-5, which is an "inflow" value (but note BCI-5 is not a "net flow" that corresponds to the change in stock). The denominator is the number of people eligible for unemployment benefits, and it is based on a 12-month period ending six to nine months prior to the month of reference. (There is a six– to nine–month delay in the compilation and release of the covered employment data).

Sources and Acknowledgments

The data descriptions in this section are based primarily on material originally published in the *Handbook of Cyclical Indicators*, 1984 (U.S. Department of Commerce, Bureau of Economic Analysis); *Employment and Earnings* (U.S. Department of Labor, Bureau of Labor Statistics); and *BLS Handbook of Methods*, 1997 (U.S. Department of Labor, Bureau of Labor Statistics).

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Further information can also be obtained from these Web sites:

Bureau of the Census home page: www.census.gov
Bureau of Labor Statistics home page: www.bls.gov
CPS Project Overview: www.bls.census.gov/cps/cpsmain.htm
Current Population Survey Overview: www.bls.gov/cpshome.htm
Employment Training Agency (U.S. Department of Labor): www.doleta.gov
National Current Employment Statistics Overview: www.bls.gov/cesprog.htm
Unemployment Insurance Information: www.doleta.gov/programs/uibene.htm

Personal Income and Personal Consumption Expenditures

A. Personal Income

OVERVIEW

Personal income is the income received by persons from all sources – that is, from participation in production (principally labor income, such as wages and salaries), transfer payments from government (such as social security payments), transfer payments from business (such as automobile and medical malpractice insurance payments), interest, dividends, and rental income. Persons are defined to consist of more than just individuals (see technical notes below).

The monthly personal income data are closely related to *national income* that is reported on a quarterly basis. These data are also closely related to, but not equivalent to, total national output because they include certain income items that do not accrue in production (e.g., government transfer payments, and government interest), and some income items that do accrue in production are not included because they are not distributed to persons (e.g., undistributed corporate profits and contributions for social insurance).

Personal income less transfer payments in constant dollars *(BCI-51)* is a component of the coincident index and the entire set of personal income data (including the related personal consumption expenditures discussed in the next section) is closely followed and studied by forecasters that look at the relationship between disposable income and consumer spending.

Persons are defined to include individuals, nonprofit institutions, private noninsured welfare funds, and private trust funds. Although life insurance carriers and private noninsured pension funds are not counted as persons, employer contributions to life insurance policies and private noninsured pension funds, and the investment income that increases the value of these life insurance policies (those with a saving component) and private noninsured pension funds, is credited to persons (as saving).

TECHNICAL NOTES

Personal income is the sum of wages and salary disbursements, other labor income, proprietors' income with inventory valuation and capital consumption adjustments, rental income of persons with capital consumption adjustment, personal dividend income, personal interest income, and transfer payments less personal contributions for social insurance.

Wage and salary disbursements consist of the monetary remuneration of employees, including the compensation of corporate officers; commissions, tips, and bonuses; voluntary employee contributions to certain deferred compensation plans, such as 401(k) plans; and receipts in kind that represent income to the recipients. They differ from wages and salaries included in compensation of employees because they include retroactive wages when paid, rather than when earned.

Other labor income includes employer contributions to private pension and welfare funds; fees paid to jurors and witnesses; compensation of prisoners; marriage fees paid to justices of the peace; and directors' fees. It excludes employer contributions to publicly administered funds such as old-age, survivors, disability, and hospital insurance; unemployment insurance; and civilian government employees retirement.

Proprietors' income with inventory valuation (IVA) and capital consumption adjustments (CCAdj) is the monetary income and income in kind of sole proprietorships and partnerships, and of pr incomes received by persons who are not primoducers' cooperatives. Interest and dividend income received by proprietors, and rentalarily engaged in the real estate business are excluded. Proprietors' income is treated in its entirety as received by individuals.

Rental income with capital consumption adjustment (CCAdj) includes, besides the monetary income of persons from the rental of real property, the imputed net rental income of owner-occupants of nonfarm dwellings, and the royalties received by persons from patents, copyrights, and rights to natural resources. The monetary rental income received by persons who are primarily engaged in the real estate business is not included.

Personal dividend income is payments in cash or other assets, excluding stock, by corporations organized for profit to stockholders.

Personal interest income is the interest income of persons from all sources. In the national income and product accounts, it is calculated as net interest plus interest paid by government to persons and business, less interest received by government, plus interest paid by consumers to business. The last item includes interest paid by individuals in their capacity as consumers, but excludes their interest payments on mortgages and home improvement loans because homeowners are treated as businesses in the national income and product accounts.

Transfer payments to persons are payments for which the recipient does not render (current) services. It consists of business and government transfer payments. Business transfer payments include liability payments for personal injury and corporate gifts to nonprofit institutions. Government transfer payments include payments under the following programs: federal old-age, survivors, disability, and hospital insurance; supplementary medical insurance; state unemployment insurance; railroad retirement and unemployment insurance; government retirement; workers' compensation; veterans, including veterans life insurance; food stamps; black lung; supplemental security income; and direct relief. Government payments to nonprofit institutions other than for work under research and development contracts are also included.

Personal contributions for social insurance includes payments by employees, self-employed, and other individuals who participate in the following programs: federal old-age, survivors, disability, and hospital insurance; supplementary medical insurance; state unemployment insurance; railroad retirement insurance; government retirement; and veterans life insurance.

Note: IVA and CCAdj are designed to obtain a measure of income in which inventories and fixed capital are valued at replacement cost, the valuation concept underlying national income and product accounting, rather than historical cost, the valuation concept underlying business accounting. CCAdj also places the using up in production of fixed capital on a consistent basis with respect to service lives and depreciation formulas (straight-line).

For additional category breakdowns and related information, see the Survey of Current Business, published monthly by the Bureau of Economic Analysis (BEA).

SOURCE AGENCY

Bureau of Economic Analysis, with additional calculations by The Conference Board. BCI-223 begins in 1946; BCI-51, BCI-52, and BCI-53 begin in 1959.

BCI-223 (A0M223)
Source – BEA

Personal Income

Billions ($), SAAR

This series measures total personal income, as described in the overview.

BCI-52 (A0M052)
Source – BEA, TCB

Personal Income, Constant Dollars

Billions (chained 96$), SAAR

This series measures personal income (as described in the overview) in chain-weighted 1996 dollars. The deflation calculation uses the implicit chain-weighted price index for personal consumption expenditures (PCE, see next section).

BCI-51 (A0M051)
Source – BEA, TCB

Personal Income Less Transfer Payments, Constant Dollars

Billions (chained 96$), SAAR

This series measures personal income in chain-weighted 1996 dollars (as described in the overview), excluding transfers such as Social Security payments, and with an adjustment for wage accruals less disbursements (WALD) that smoothes bonus payments. The deflation calculation uses the same PCE-based price index as BCI-52.

BCI-53 (A0M053)
Source – BEA, TCB

Wages and Salaries in Mining, Manufacturing and Construction

Billions (chained 96$), SAAR

This series measures wage and salary disbursements in nonfarm commodity-producing industries. It includes disbursements to workers in mining, manufacturing, construction, and a small component, "forestry, fisheries, and agricultural services." The deflation calculation uses the implicit chain-weighted price index for personal consumption expenditures (PCE, see BCI-52).

B. Personal Consumption Expenditures

OVERVIEW

Personal consumption expenditures (PCE) consists of goods and services purchased by individuals; the operating expenses of nonprofit institutions serving individuals; and the value of food, fuel, clothing, rent of dwellings, and financial services received in kind by individuals. Net purchases of used goods are also included.

Total PCE and category breakdowns, such as durables, nondurables, and services, are available in both current and constant (inflation-adjusted) dollars. Users of these data should recognize that, although reported on a monthly basis, the PCE categories are generally based on interpolations and extrapolations from the annual estimates.

TECHNICAL NOTES

Personal consumption expenditures covers almost all purchases of new goods and services by individuals from business and government, and purchases of the services of paid household workers. Not included, among other items, are purchases for business, purchases from other individuals, and purchases of dwellings.

PCE includes purchases of goods and services abroad by U.S. residents traveling or working in foreign countries, likewise purchases in the United States by foreign visitors are not included. Purchases by nonprofit institutions from business, individuals, and government are also included (goods and services, not purchases of structures and equipment). Also, net purchases of used goods by individuals and nonprofit institutions from business and from government are included, but transactions between persons are not included because they cancel in the aggregation of the personal sector.

Finally, PCE includes imputed purchases (and other adjustments) that keep it invariant to changes in the way that certain activities are carried out – for example, whether housing is rented or owned, whether employees are paid in cash or in kind, or whether farm products are sold or consumed on farms.

The current-dollar annual estimates of PCE, including comprehensive or benchmark estimates produced at five-year intervals, are based on statistical reports, primarily from the Census Bureau, but also from other government agencies; on government administrative and regulatory agency reports; and on reports from private organizations (i.e., trade sources).

- The Census Bureau statistical reports cover the following: sales, inventories, and cost of purchased goods for manufacturing and trade; transportation, communication, utilities, finance, and service industry receipts and expenses; state and local government revenues; and residential rental payments.
- The statistical reports of other government agencies cover the following: cash receipts by farmers for agricultural products, sales of electricity, natural gas, fuel oil and coal, gasoline and oil, revenue from public transportation services, international trade in services, receipts and expenses for higher education, and prices paid by consumers.
- Government administrative and regulatory agency reports cover the following: merchandise trade, wages and salaries, revenues from transportation services, telephone services, brokerage commissions, and bank service charges.
- Reports from trade sources cover the following: sales to persons of new and used cars and new trucks, telephone and telegraph service, transit service, brokerage and investment counseling, expenses for life insurance, premiums and benefits for nonlife insurance, expenses for hospitals, and expenses for religion.

Current-dollar monthly estimates of most PCE categories are prepared using indicator series to interpolate between and extrapolate from the annual estimates. Among the more important monthly indicator series are retail store sales, unit sales of automobiles and trucks, wages and salaries, securities transactions, quantities of gasoline purchases, changes in the housing stock, and utility usage. Where these series provide quantity measures, monthly price indexes are used to obtain value indicators.

The constant-dollar estimates of PCE are prepared at a detailed level using one of three methods. The method used for most of the categories is deflation; that is, constant-dollar estimates are obtained by dividing current-dollar estimates, at the most detailed category level, by appropriate price indexes with the base period – at present, the year 1996 equal to 100. The other methods, direct base-year valuation and quantity extrapolation, are similar in that they both use quantity indicators.

The deflated subcategories are aggregated to form PCE in constant 1996 dollars using a chain-weighted formula. This is not a simple or direct aggregation of the deflated categories. Instead, a total quantity index (which therefore does not include inflation effects) is first created using "chained" geometric averages of the deflated growth rates from each category (i.e., a Fisher quantity index). The index is then rebased to create a constant dollar version for PCE that has the same average in 1996 as nominal PCE. The term "chain-weighted" refers to the fact that with the BEA's formula, nominal shares for each component are effectively chained together to create aggregation weights for each subcategory, that change over time.

These calculations are consistent with the chain-weighted concepts used to compute real, or constant dollar, GDP and introduced by BEA in 1996. Formerly, a "fixed-weight" formula that caused the constant dollar series to depend greatly on nominal shares in the base period was used. With chain weighting, changes in the base year do not affect real growth rates. For further information, see "Preview of the Comprehensive Revision of the National Income and Product Accounts" in the *Survey of Current Business*, July 1995, and "Improved Estimates of the National Income and Product Accounts for 1959-95" in the *Survey of Current Business*, January/February 1996.

SOURCE AGENCY
Bureau of Economic Analysis. The PCE data are released along with the personal income data. Series begin in 1959.

BCI-224 (A0M224)
Source – BEA

Personal Consumption Expenditures

Billions ($), SAAR

This series measures total personal consumption expenditures (as described above).

BCI-225 (A0M225)
Source – BEA

Personal Consumption Expenditures, Constant Dollars

Billions (chained 96$), SAAR

This series measures total personal consumption expenditures (as described above) on a chain-weighted 1996 dollars basis.

Sources and Acknowledgments

The data descriptions in this section are based primarily on the *Handbook of Cyclical Indicators*, 1984 (U.S. Department of Commerce, Bureau of Economic Analysis) and Bureau of Economic Analysis' Methodology Paper MP-6.

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Further information can be found on the Bureau of Economic Analysis Web site:
www.bea.doc.gov

Production and Capacity, Sales and Inventories, Manufacturing Orders, and Construction

A. Industrial Production and Capacity Utilization

OVERVIEW

The index of industrial production and the related capacity indexes and capacity utilization rates cover manufacturing, mining, and electric and gas utilities. This industrial sector, together with construction, accounts for the bulk of the variation in national output over the course of the business cycle.

The *industrial production indexes* measure real output in value added terms and are expressed as a percentage of the estimated value in the base year 1996. The *capacity indexes* are estimates of sustainable potential output and are expressed as a percentage of actual output in 1996. The *rate of capacity utilization* equals the seasonally adjusted output index expressed as a percentage of the corresponding capacity index.

The series that receive the most attention are the percent change in total industrial production (BCI-47) and the rate of capacity utilization in manufacturing (BCI-82).

TECHNICAL NOTES

The aggregated industrial production indexes (IPI) are computed as Fisher (i.e., chain-type) indexes from similarly constructed subcomponent indexes. The weighting factors change annually (since 1977) and reflect estimates of each subcomponent's proportion of the total value-added.

For the period since 1992, the total IPI is constructed from 267 individual series based on the 1987 Standard Industrial Classification (SIC). Other series are classified in two ways: by market groups such as consumer goods, equipment, intermediate products, and materials; and by industry groups such as two-digit SIC industries and major aggregates of these industries (for example, durable and nondurable manufacturing, mining, and utilities).

Although the total industry measure receives the most attention, detail from subcomponents can illuminate developments in important sectors of the economy. Also, for purposes of analysis, the individual industrial production series are grouped into final products, intermediate products, and materials. Final products are assumed to be purchased by consumers, businesses, or government for final use. Intermediate products are expected to become inputs in nonindustrial sectors, such as construction, agriculture, and services. Materials are industrial output requiring further processing within the industrial sector. Total products comprise final and intermediate products, and final products are divided into consumer goods and equipment.

On a monthly basis, the industrial production indexes are constructed from two main types of source data: output measured in physical units and data on inputs to the production process, from which output is inferred. Data on physical products, such as tons of steel or barrels of oil, are obtained from private trade associations as well as from various government agencies. Data of this type are used to estimate monthly IP where possible and appropriate.

After the first release of the IP indexes for a particular month (i.e., the latest month in the Federal Reserve Board report), all components and aggregates are subject to re-estimation and revision in each of the next three months. Longer, historical revisions are made with the publication of an annual revision in the fall. These annual revisions incorporate updated seasonal factors and more comprehensive data from a variety of sources, such as the quinquennial *Censuses of Manufactures and Mineral Industries* and the *Annual Survey of Manufactures*, prepared by the Bureau of the Census; the *Minerals Yearbook*, prepared by the U.S. Department of the Interior; and publications of the U.S. Department of Energy.

Capacity indexes and the corresponding rates of capacity utilization are based on the concept of sustainable practical capacity, which is defined as the greatest level of output that a plant can maintain within the framework of a realistic work schedule, taking account of normal downtime, and assuming sufficient availability of inputs to operate the

machinery and equipment in place. The 76 individual capacity indexes are based on a variety of data, including capacity data measured in physical units compiled by trade associations, surveys of utilization rates and investment, and estimates of growth of the capital input. The *Survey of Plant Capacity*, prepared by the Bureau of the Census, is the primary source data for the Federal Reserve's measure of manufacturing capacity utilization. The survey provides industry utilization rates for the fourth quarter of each year.

The monthly rates of utilization are designed to be consistent with both the monthly data on production and the periodic survey data on utilization. Because there is no direct monthly information on overall industrial capacity or utilization, the Federal Reserve first estimates annual capacity indexes from the source data. The results are interpolated to the monthly frequency, which, together with the production indexes, yield the utilization rates. In this scheme of measurement, the short-term movements in utilization typically approximate the difference between the change in the production index and the growth trend of capacity because the estimated monthly capacity indexes change slowly.

SOURCE AGENCY
Board of Governors of the Federal Reserve System. The industrial production series begin in 1919 (the BCI database begins in 1945). The capacity utilization series begin in 1948.

BCI-47 (A0M047)
Source – FRB

Industrial Production Index

Index (1992=100), SA

The IPI is an index that combines over 265 series covering all stages of production in manufacturing, mining, and electric and gas utility industries according to their proportion in the total value-added output of all industries.

BCI-172 (A0M172)
Source – FRB

Industrial Production, Manufacturing

Index (1992=100), SA

IP for manufacturing combines the durable and nondurable sectors of manufacturing (each described below).

BCI-173 (A0M073)
Source – FRB

Industrial Production, Durable Manufacturing

Index (1992=100), SA

IP for durable manufacturing is an index that measures the value-added production of manufactured items with a normal life expectancy of three years or longer. This category includes lumber and products; furniture and fixtures; clay, glass, and stone products; primary metals; fabricated metal products; industrial machinery and equipment; electrical machinery; transportation equipment; instruments; and miscellaneous manufactures.

BCI-74 (A0M074)
Source – FRB

Industrial Production, Nondurable Manufacturing

Index (1992=100), SA

IP for nondurable manufacturing is an index that measures the value-added production of manufactured items with a normal life expectancy of less than three years. It includes foods, tobacco products, textile mill products, apparel products, paper and products, printing and publishing chemicals and products, petroleum products, rubber and plastic products, and leather and products.

BCI-75 (A0M075)
Source – FRB

Industrial Production, Consumer Goods

Index (1992=100), SA

IP for consumer goods is an index that measures the value-added production of the components of the total industrial production index that are classified as consumer goods (both durables and nondurables). It includes automotive products, home goods such as appliances and consumer electronics, clothing and other consumer staples, and consumer energy products.

BCI-76 (A0M076)
Source – FRB

Industrial Production, Business Equipment

Index (1992=100), SA

IP for business equipment is an index that measures the value-added production of the components of the total industrial production index that are classified as business equipment. This group includes information processing and related equipment; industrial equipment; transit equipment; and other equipment such as farm and commercial equipment.

BCI-177 (A0M177)
Source – FRB

Industrial Production, Utilities

Index (1992=100), SA

IP for utilities is an index that measures the value-added production of the components of electric utilities (generation and sales) and gas utilities (transmission and sales).

BCI-557 (A0M557)
Source – FRB

Industrial Production, Defense and Space Equipment

Index (1992=100), SA

IP for defense and space equipment is an index that measures the value-added production of the components of the total industrial production index that are classified as defense and space equipment. It includes: military aircraft, ordnance, ships, and tanks; guided missiles and space vehicles; communication equipment, and guidance and navigation equipment for defense purposes; and nuclear materials manufactured for defense purposes.

BCI-124 (A0M124)
BCI-82 (A0M082)
BCI-84 (A0M084)
Source – FRB

Capacity Utilization Rate
Capacity Utilization Rate, Manufacturing
Capacity Utilization Rate, Durable Manufacturing

Percent, SA

Capacity utilization rates are derived from the Federal Reserve's industrial production indexes, survey data on utilization rates from the Bureau of the Census, capacity estimates in physical units for selected industries from government and trade sources, and measures of capital input (estimates of the flow of services from tangible capital) prepared by the Federal Reserve.

Capacity utilization rates are based on the ratio of industrial production for a given industry group and the corresponding estimate of sustainable capacity.

B. Manufacturing and Trade Sales and Inventories

OVERVIEW

These series measure the sales and inventories of manufacturing, merchant wholesalers, and retail establishments. The data cover a large portion of the U.S. economy but exclude agriculture, forestry, and fishing; mining; construction; nonmerchant wholesalers (sales branches of manufacturing companies, agents, brokers, and commission merchants); transportation, communication, electric, gas, and sanitary services; finance, insurance and real estate; and services.

TECHNICAL NOTES

These series are principally derived from monthly data gathered by the Bureau of the Census with further adjustments made by the Bureau of Economic Analysis (BEA), both agencies of the U.S. Department of Commerce. The Census data include the monthly M3-1 Current Industrial Reports, which compiles shipments, inventories, and orders from a survey of manufacturers, and additional surveys of merchant wholesalers and retail trade stores. The series are also adjusted to benchmarks from the five-year censuses of manufactures, wholesale trade, and retail trade, and to interim annual surveys.

Manufacturers' sales are defined as the value of their shipments for domestic use or export. Shipments are measured by receipts, billings, or the value of products shipped (less discounts, returns, and allowances). This measurement generally excludes freight charges and excise taxes. Shipments from one division to another within the same company in the United States and shipments by domestic firms to foreign subsidiaries are included, but shipments by foreign subsidiaries are not included. For some aircraft and all shipbuilding, the "value of shipments" is the value of the work done during the period covered, rather than the value of the products physically shipped.

Merchant wholesalers' sales include sales of merchandise and receipts from repairs or other services (after deducting discounts, returns, and allowances), and sales of merchandise for others on a commission basis. Sales taxes and Federal excise taxes are excluded.

Retail sales include total receipts from customers after deductions of refunds and allowances for merchandise returned. Receipts from rental or leasing of merchandise and from repairs and other services to customers are also included. (Since 1967, finance charges and sales and excise taxes collected from customers and paid to tax agencies by the retailer are excluded.)

Manufacturers' inventories are book values of stocks-on-hand at the end of the month. They include materials and supplies, work in process, and finished goods. Inventories associated with nonmanufacturing activities of manufacturing companies are excluded.

Merchant wholesalers' and retail inventories are also book values of merchandise-on-hand at the end of the month. Goods held on consignment by wholesalers and retailers are excluded.

Inventories (effective with the 1982 Economic Censuses) are valued on a "pre-last-in-first-out," or "pre-LIFO," basis. Annual information is obtained on the portions of inventories valued by the various accounting methods. Manufacturers' inventories and sales of defense products are based on separate reports covering only the defense work of large defense contractors in ordnance and accessories; communication equipment; aircraft, missiles and parts; and shipbuilding and tank industries. These defense products cover only work for the U.S. Department of Defense and orders from foreign governments for military goods contracted through the U.S. Department of Defense.

Constant-dollar sales and inventory series are computed by BEA starting at the finest level of detail possible, primarily using appropriate combinations of PPI and CPI data from the Bureau of Labor Statistics.

- Manufacturers' sales (shipments) are deflated within the Census M3-1 categories (which roughly correspond to three-digit SIC), primarily using four-digit SIC industry output PPI data weighted according to levels primarily using the most recent Census of Manufacturing shipment data.
- Wholesale sales are deflated by kind of business, also primarily using appropriate PPI data weighted according to commodity line sales from the most recent Census of Wholesale Trade.
- Retail sales are deflated by kind of business, primarily using components of the CPI for All Urban Consumers weighted according to merchandise line sales from the most recent Census of Retail Trade.

The aggregates are created using the BEA's chain-type annual-weighted procedure. The inventories series are deflated in a manner similar to sales, but using lag structures based on information on inventory turnover periods developed from stock/sales ratios and survey data on inventory accounting practices. For data prior to 1958, however, the aggregate of the components was deflated using a lagged four-month moving average of the Producer Price Index for Industrial Commodities.

All series are seasonally adjusted by BEA to account for the effect of holidays, trading day differences, and other seasonal factors. The book-value inventory estimates and the deflators are seasonally adjusted prior to the deflation.

SOURCE AGENCY

Bureau of Economic Analysis and the U.S. Census Bureau (as noted). Series begin in 1959 except as noted.

BCI-57 (A0M057)
Source – BEA

Manufacturing and Trade Sales

Millions (chained 96$), SA

This series measures the monthly sales volume of manufacturing, merchant wholesalers, and retail establishments (as defined above).

BCI-59 (A0M059)
Source – BEA, TCB

Sales of Retail Stores

Millions (chained 96$), SA

This series measures the net sales and receipts of establishments primarily engaged in retail trade. Wholesale sales of retail establishments are included. Retail sales of manufacturing, wholesale, service, and other establishments whose primary activity is not retail trade, are excluded.

TECHNICAL NOTES

Net sales are defined as cash and credit sales less discounts, refunds, and allowances for returned merchandise. (Trade-in allowances are not deducted.) Receipts include payments for rental or leasing of merchandise to customers and for repair and other services. Commissions from vending machine operators and nonoperating income, such as investments and real estate, are not included. Since 1967, finance charges, as well as sales and excise taxes collected from customers and paid directly to tax agencies, are also excluded.

A retail establishment is defined as one engaged primarily in selling merchandise for personal or household consumption. As the term establishment refers to the physical location at which the retail business is conducted, a company or enterprise may comprise one or more establishments. If two or more activities are carried on at a single location, the entire establishment is classified on the basis of its major activity.

BCI-69 (A0M069)
Source – Census, TCB

Manufacturers' Machinery and Equipment Sales and Business Construction Expenditures

Billions ($), SAAR

This series measures the value of manufacturers' shipments (sales) of nondefense capital goods and construction put-in-place for private industrial and commercial use in current dollars.

TECHNICAL NOTES

This series is constructed by The Conference Board from Census data and it is not deflated (a BEA counterpart is not available). Census includes in the manufacturers' shipments component nondefense items from the following industry categories: ordnance and accessories, steam engines and turbines, internal combustion engines construction, mining and material handling equipment, metalworking machinery, special industry machinery, general industrial machinery, computer and office equipment, refrigeration, heating and service industry machinery, electrical transmission and distribution equipment, electrical industrial apparatus, communications equipment, aircraft, missiles, space vehicles, and space vehicle engines and parts, ships and tank components, railroad equipment, and search and navigation equipment. The construction components are "put-in-place" values that consist of industrial (all buildings and structures at manufacturing sites), office (including professional buildings used primarily for office space and office buildings owned by an industrial company that are not located at an industrial site), and other commercial buildings and structures intended for use by wholesale, retail, or service trade establishments (such as shopping centers and malls, department stores, low-rise banks and financial institutions, drug stores, parking garages, auto service stations and repair garages, beauty schools, grocery stores, restaurants, and dry cleaning stores, as well as warehouses and storage buildings, cold storage plants, grain elevators and silos that are not at industrial sites).

BCI-70 (A0M070)
Source – BEA

Manufacturing and Trade Inventories

Billions (chained 96$), SA

This series measures the dollar value of inventories held by manufacturing, merchant wholesalers, and retail establishments.

BCI-77 (A0M077)
Source – BEA, TCB

Ratio, Manufacturing and Trade Inventories to Sales

Percent (based on chained 96$), SA

This series measures the ratio of the end-of-month value of inventories on hand in manufacturing, merchant wholesalers, and retail establishments to the value of monthly sales of these establishments. It is computed by dividing manufacturing and trade inventories (BCI-70) by manufacturing and trade sales (BCI-57), both of which are in chained 1996 dollars and independently seasonally adjusted.

BCI-31 (A0M031)
Source – Census, TCB

Change in Manufacturing and Trade Inventories

Billions ($), SA

This series measures the month-to-month annualized change in manufacturing and trade inventories. It is not deflated, and is based on changes in book value that reflect changes in replacement costs as well as changes in physical volume. This series begins in 1948 and comes directly from a U.S. Census Bureau report.

C. Manufacturer's Orders

OVERVIEW

Manufacturers' new and unfilled orders data are based on a survey conducted by the U.S. Census Bureau (U.S. Commerce Department). Unfilled orders are the total stock of new and old orders received, but not yet recorded as a sale (i.e., passed through the sales account and/or shipped), and are end-of-the-month figures. New orders represent "intents to buy" received during the month that are supported by a serious commitment from the ordering party (such as a legal contract or letter of intent), can be either for immediate or future delivery, and are net of cancellations of previously unfilled orders. In most cases, new orders are derived from the unfilled orders and corresponding shipments such that new orders equal the change in unfilled orders plus the current value of shipments. Shipments are similar in concept to sales that are defined in the "Manufacturing and Trade Sales and Inventories" section.

TECHNICAL NOTES

Constant-dollar versions of the new and unfilled orders series are calculated by The Conference Board using chain-weighted deflation concepts.

Manufacturers' New Orders for Nondefense Capital Goods (BCI-27), a component of the leading index, typically receives the greatest attention among these series. Changes in Unfilled Orders for Durable Goods (BCI-92) and Manufacturers' New Orders for Consumer Goods and Materials (BCI-8) are also monitored closely by many forecasters, and the latter series is also a component of the leading index.

The new and unfilled orders data are based on the Manufacturers' Shipments, Inventories, and Orders (M3) survey conducted by the U.S. Census Bureau. The Census M3 survey provides broad-based, monthly statistical data on economic conditions in the domestic manufacturing sector and is used by the Bureau of Economic Analysis (BEA) to derive various components of the National Income and Product Accounts (NIPA). BEA produces a set of monthly sales and inventory series (described in the preceding section) using the same survey data. BEA makes adjustments so that the data are consistent with National Income and Product Accounts concepts, and these series are included in the BCI.)

There are 80 separately tabulated industry categories in the M3 survey (based on groupings of the 459 manufacturing industries defined in the 1987 Standard Industrial Classification [SIC] Manual). Companies provide the data on a voluntary basis and the survey includes most manufacturing companies with $500 million or more in annual shipments, as well as selected smaller companies. Companies with less than 100 employees are not part of the survey, but data for these and other nonsampled companies are estimated, using overall industry averages. (The methodology assumes that the month-to-month changes in the data from the reporting units in each industry category represent the month-to-month movements of all other establishments in that industry category.)

Only orders supported by binding legal documents, such as signed contracts, letters of intent, or letters of award, are counted. Reporting companies are instructed to include: (1) the sales value of orders to be delivered at some future date; (2) the sales value for orders for immediate delivery (therefore resulting in sales during the reporting period); (3) the net sales value of contract change documents that increase or decrease the sales value of the orders to which they are related, if the parties are in substantial agreement on the amount involved; and (4) deductions for lost sales value from partial or complete cancellations of existing orders.

While reports of both new orders and unfilled orders are used in reviewing individual company data for consistency, only unfilled orders are estimated directly from company data (using the tabulated totals from the survey). New orders are derived using the orders-shipments identity: new orders equal the change in unfilled orders and the current value of shipments. This is done for three reasons: (1) many companies supply new orders' data only for those activities with a backlog of unfilled orders; (2) some companies omit from new orders the value of shipments for goods delivered from inventories or current production; and (3) to preserve the identity between new orders, unfilled orders, and shipments. Therefore, the new orders series is not a separately estimated item, but instead is derived from the shipments and unfilled orders series (even in seasonally adjusted form; i.e., new orders are not independently seasonally adjusted).

For many nondurable goods industries and a few durable goods industries, unfilled orders data are not tabulated because nearly all orders are shipped from inventories or current production, or simply because unfilled orders are not reported by the respondents in some industries. The value of current shipments is the best estimate of new orders for these industries.

The constant-dollar versions of the new and unfilled orders series are calculated by The Conference Board using implicit deflators derived from detailed sales data supplied by BEA and a modified form of BEA's chain-weighted deflation procedure. (The implicit deflators are chain-type and applied at a two-or three-digit SIC level. The primary difference between the BEA and TCB deflation formula is that the BEA uses a modified Fischer index formula while TCB uses a linked Laspeyres formula that produces similar results, but is somewhat easier to implement with these data.)

These series include seasonal adjustments that are designed to eliminate the effect of changes that occur at about the same time and with similar magnitude each year.

SOURCE AGENCY

These series are based on data compiled and released by the U.S. Census Bureau in current-dollar form. The constant-dollar versions are calculated by The Conference Board using deflators created from BEA data. Series begin in 1959.

BCI-92 (A1M092)
Source – Census, TCB

Manufacturers' Unfilled Orders, Durable Goods

Millions (chained 96$), SA

This series measures the value of unfilled orders for the durable goods portion of manufacturing sector. The level (A1M092), the arithmetic change (A0M092), and the percent change annualized and measured over a six-month span (A6M092), are included in the BCI database.

BCI-7 (A0M007)
Source – Census, TCB

Manufacturers' New Orders, Durable Goods Industries

Millions (chained 96$), SA

This series measures the value of new orders of manufacturers producing durable goods. Durable goods are good with an expected life of three years or longer. The current dollar version (A1M007) is also included in the BCI database.

BCI-8 (A0M008)
Source – Census, TCB

Manufacturers' New Orders, Consumer Goods and Materials

Millions (chained 96$), SA

This series measures the value of new orders of consumer goods and materials. These new orders include the durable goods industries other than capital goods and defense producers. This series includes four nondurable goods industries: textile mill products; paper and allied products; printing, publishing, and allied products; and leather and leather products. The current dollar version (A1M008) is also included in the BCI database. Note that A1M008 is not a line item in a U.S. Census Bureau report, but instead is calculated by The Conference Board using M3 report details.

BCI-27 (A0M027)
Source – Census, TCB

Manufacturers' New Orders, Nondefense Capital Goods

Millions (chained 96$), SA

This series measures the value of new orders of the capital equipment portion of durable goods, less defense items. The nondefense capital goods are comprised of five subgroups:

1) Industrial machinery and equipment – including steam engines and turbines; internal combustion engines; construction, mining, and material-handling equipment; metalworking machinery; special industry equipment; general industry equipment; office and computer equipment; service industry machinery. (Excluded are certain miscellaneous nonelectrical equipment such as farm machinery and machine shops.)
2) Electronic and other electrical machinery – including electrical transmission and distribution equipment, electrical industrial apparatus, other electrical machinery, and the nondefense portion of communication equipment. (Excluded are electrical machinery such as household appliances, consumer audio and video equipment, and electronic components.)
3) Transportation equipment – railroad equipment and the nondefense portions of shipbuilding; military tank vehicles; and aircraft, missiles, and parts.
4) Fabricated metals – the nondefense portion of ordnance.
5) Instruments and related products – the nondefense portion of search and navigation equipment.

The current dollar version (A1M027) is also included in the BCI data base.

BCI-548 (AOM548)
Source – Census

Manufacturers' New Orders, Defense Capital Goods

Millions ($), SA

This series measures the value of new orders of manufactured defense items that together with BCI-27 makes up the entire capital equipment portion of (durable) new orders. BCI-548 is only available in current dollar form.

D. Construction

BCI-9 (A0M009)
Source – McGraw-Hill, TCB

Construction Contracts Awarded (copyrighted by F.W. Dodge)

Million square feet, SA

This series measures the amount of floor space, in both square feet and square meters, specified in new contracts for work about to get underway on commercial buildings (banks, offices and lofts, stores, warehouses, garages, and service stations) and manufacturing buildings (for processing or mechanical use). This series is copyrighted and used with permission from F. W. Dodge, a unit of McGraw-Hill, Inc.

BCI-20 (A0M020)
Source – McGraw-Hill, TCB

Contracts and Orders for Plant and Equipment

Billions (chained 96$), SA

This series measures the value of new contracts awarded to building, public works, and utilities contractors (BCI 9) and of new orders for nondefense capital equipment (BCI-27). The contracts portion is based on data from F.W. Dodge and covers the value of new construction, additions, and major alterations for (1) commercial and industrial construction about to get underway on commercial buildings (banks, offices and lofts, stores, warehouses, garages, and service stations), and manufacturing buildings (for processing or mechanical usage) and (2) privately owned nonbuilding construction about to get under way on streets and highways, bridges, dams and reservoirs, waterfront developments, sewerage systems, parks and playgrounds, electric light and power systems, gas plants and mains, oil and gas well pipelines, water supply systems, railroads, and airports (excluding buildings). Maintenance work is excluded, and the contract valuations approximate actual construction costs exclusive of land, architects' fees, and, in the case of manufacturing buildings, the cost of equipment that is not an integral part of the structure.

TECHNICAL NOTES

The contracts data are compiled by F.W. Dodge based on reports submitted to F.W. Dodge and supplementary reports from permit-places. Beginning with January 1969, the contracts data cover construction in the 50 states and the District of Columbia. In the period 1956–1968, data cover the 48 contiguous states and the District of Columbia; prior to 1956, only the 37 states east of the Rocky Mountains and the District of Columbia are included.

The contracts values are deflated by The Conference Board using an implied deflator derived from Census construction data (the current-dollar value of nonresidential construction put-in-place divided by the constant 1992-dollar version). This deflated series is then seasonally-adjusted and added to the constant dollar version of BCI-27 (a chain-type adjustment is not made to aggregate these two series) to create BCI-20.

SOURCE AGENCY

The contracts data from F.W. Dodge are copyrighted. The Conference Board has obtained permission from F.W. Dodge to make seasonal adjustments and include in the BCI database. (Prior to 1996, the Bureau of Economic Analysis performed this function.) BCI-09 begins in 1963 and BCI-20 begins in 1959.

BCI-28 (A0M028)
Source – Census

New Private Housing Units Starts

Thousands, SAAR

This series measures the number of private housing units started each month, in seasonally adjusted and annualized form. All types of accommodations designed as separate living quarters and constructed in new buildings, such as year-round and seasonal houses, prefabricated houses, basement houses, shell houses, and houses built of second-hand materials, are included, regardless of value or quality.

BCI-29 (A0M029)
Source – Census

Building Permits for New Private Housing

Thousands, SAAR

This series measures the annualized rate of housing units authorized by local permit-issuing places (based on the date of issuance). BCI-29 is a component of the leading index.

TECHNICAL NOTES

Housing starts is defined as construction begun on a new building that is intended primarily as a housekeeping residential building and designed for nontransient occupancy. All housing units in a multifamily building are counted as started when excavation of the foundation begins. The conversion of either residential or nonresidential space to provide additional numbers of housing units and the production of mobile homes is excluded.

Building permits are typically required before residential construction may begin. The data reflect the issuance of permits, not the start of construction, which may occur several months later. Furthermore, in a small number of cases, permits are not used and are allowed to lapse.

Data since 1994 are based on reports from 19,000 permit-issuing places. Permits issued by these 19,000 places account for approximately 95 percent of all new residential construction in the United States. The remaining 5 percent is in areas that do not require building permits. Pre-1994 data have been adjusted to make them comparable to the current 19,000 permit-issuing methodology.

SOURCE AGENCY

U.S. Census Bureau (for current data). BCI-28 begins in 1946. BCI-29 begins in 1954.

Sources and Acknowledgments

The data descriptions in this section are based primarily on material originally published in the *Handbook of Cyclical Indicators*, 1984 (U.S. Department of Commerce, Bureau of Economic Analysis).

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Further information can also be obtained from these Web sites:
Federal Reserve Board: www.federalreserve.gov/releases/g17
Bureau of Economic Analysis: www.bea.doc.gov
U.S. Census Bureau: Construction expenditures: www.census.gov/ftp/pub/const/www/c30index.html
Orders: www.census.gov/ftp/pub/indicator/www/m3/index.htm

Price Indexes (CPI, PPI, and Commodities)

A. Consumer Price Indexes

OVERVIEW

Consumer Price Index (CPI) refers to a system of price indexes compiled and reported by the Bureau of Labor Statistics (BLS). In index form, they monitor prices paid by urban consumers for a generally fixed market basket of goods and services. They are designed to capture "pure" price changes (i.e., price changes not influenced by changes in quality and quantity, that move with general price inflation).

The current CPI system emphasizes urban consumers (CPI-U) and attempts to represent the buying habits of about 80 percent of the non-institutional population. It uses 1982-84 as the index base, but relies on Consumer Expenditure Survey data from 1993-95 to determine the general construction of the representative market basket.

Movements of the indexes from one month to another are usually expressed and analyzed as a percent changes (i.e., the rate of inflation, rather than the level of the index or its arithmetic change). Percent changes in CPI-U, All Items less Food and Energy (BCI-323), generally receive the greatest attention.

TECHNICAL NOTES

The CPI is based on a sample of prices of food, clothing, shelter and fuels, transportation, medical services, and other goods and services that people buy for day-to-day living. The CPI is constructed by repricing essentially the same market basket of goods and services at regular intervals, and comparing aggregate costs with those of the same basket in a selected base period.

The CPI system provides both broad and detailed information about the average price change for various consumer items within various geographical areas. Currently, prices for goods and services are collected in 87 urban areas and from about 21,000 retail and service establishments. Data on rents are collected from about 50,000 landlords. The averaging process uses weights that represent the importance of the items to the spending pattern of the appropriate (population) group of that area. Separate indexes are compiled for the urban United States, four regions, three size classes, 10 groups cross-classified by region and population size, and 26 metropolitan statistical areas.

The CPI system has been revised extensively about every 10 years. This work primarily relies on data from the Consumer Expenditure Survey compiled by the Bureau of the Census. The most fundamental and visible activity in these revisions is the introduction of a new market basket or set of expenditure weights attached to the categories of goods and services that comprise the CPI. Consumer Expenditure Survey data from 1993-95 were used to calculate new weights for each item strata category in every CPI index area in 1998. Changes in price index methodology have also been made to improve the accuracy of the CPI.

The CPI index base was kept at 1982–84=100 with the latest set of revisions. Many of the CPI series are published in both seasonally-adjusted and unadjusted form, and the BLS has tended to seasonally adjust more components over time. Seasonally adjusted data are usually preferred for general analysis because they are designed to eliminate the effect of changes that occur at about the same time and with similar magnitude each year. Seasonal adjustment factors change annually.

SOURCE AGENCY

Bureau of Labor Statistics. Series begin in 1947.

BCI-320 (A0M320)
Source – BLS

CPI for All Urban Consumers, All Items (CPI-U)

Index (1982-84 = 100), SA

This series is the broadest within the CPI and represents the entire buying habits of all urban consumers (about 80 percent of the non-institutional population) using a fixed market basket of goods and services that was derived from the 1993-95 Consumer Expenditure Survey. Adjustments are made for changes in the quality and the introduction of new goods and goods and services over time.

BCI-323 (A0M323)
Source – BLS

CPI-U, All Items Less Food and Energy

Index (1982-84 = 100), SA

This CPI-U series includes all items in BCI-320 except for the food and energy components. Because food and energy products are considered overly volatile, the percent change in this series is often referred to as a measure of "core" inflation.

BCI-120 (A0M120)
Source – BLS

CPI-U for Services

Index (1982-84 = 100), SA

This CPI-U series includes only the service portion of BCI-320, such as household (including rent and rental-equivalent costs of shelter), transportation, and medical services. Percent changes in BCI-120 measured over a six-month span (A6M120) are a component of the lagging index.

Historical Notes

The CPI system was initiated by the Federal government during World War I when rapid increases in prices made such an index essential for calculating cost-of-living adjustments in wages. Soon after it was founded in 1916, The Conference Board also developed a separate cost-of-living index series that was used in wage negotiations. The Conference Board's price index was discontinued in 1958. The correlation between the BLS and The Conference Board's CPI was very high.

The CPI is reported for two population groups: One consists only of wage earners and clerical workers (CPI-W); the other consists of all urban consumers (CPI-U). CPI-W is a continuation of the original index and is not carried in the BCI. CPI-U was introduced in 1978 and is considered more representative of the average U.S. consumers' buying habits.

The last major reformulation of the CPI (the sixth in its history) is usually identified as the 1998 revision. This revision is actually a comprehensive, multi-year effort planned for completion in the six-year period ending in 2000. Changes include reselection and reclassification of areas, items and outlets to the development of new systems for data collection and processing.

B. Producer Price Indexes

OVERVIEW

Producer Price Index (PPI) refers to a system of price series compiled and reported by the Bureau of Labor Statistics (BLS). In index form, they measure the average selling price received by domestic producers for their output and are designed to monitor "pure" price changes (i.e., price changes not influenced by changes in quality, quantity, shipping terms, or product mix).

The PPI system covers the output of all industries in the goods-producing sectors: mining, manufacturing, agriculture, fishing and forestry, as well as gas, electricity, and goods competitive with those made in the producing sectors, such as waste and scrap materials. Goods produced domestically and shipped between establishments owned by the same company are included, but imports are not. Goods made domestically specifically for the military are also included.

Percent changes in PPI, Finished Goods less Foods and Energy (BCI-336), generally receive the greatest attention.

TECHNICAL NOTES

The PPI was known as the Wholesale Price Index until 1978, and is one of the oldest continuous series of statistical data published by the BLS. It was first reported in 1902, but origins of the index can be found in an 1891 U.S. Senate resolution authorizing the Senate Committee on Finance to investigate the effects of tariff laws on prices. The modern form began in 1978 with the name change to Producer Price Index, which was intended to emphasize a focus on prices received by producers rather than by wholesalers or retailers. (An overhaul of the BLS industrial price system began in 1978 and was essentially completed in 1986.)

The PPI consist of several major classification groups, each with its own structure, history and uses. The three most important are industry, commodity, and stage of processing. Prices in about 500 separate industries are followed, and there are over 10,000 specific products and product categories. There are also over 3,000 commodity price indexes organized by product type and end use. The stage of processing categories are finished goods, intermediate materials, and crude materials (for further processing).

For purposes of PPI construction, a price is defined as the net revenue accruing to a specified producing establishment from a specified kind of buying for a specified product shipped under specified transaction terms on a specified day of the month. Because these prices are primarily designed to measure changes in net revenues received by producers, changes in excise taxes are not reflected. Neither order prices nor futures prices are included because the PPI tries to capture the selling price for output shipped in that same month, not at some other time.

The raw data are drawn from a pool of price information provided to BLS by cooperating company reporters, and so the statistical accuracy of the PPI depends heavily on the quality of the information provided by these respondents. When a respondent reports a price that reflects a physical change in a product, BLS uses one of several quality adjustment methods. The direct method is used when the change in the physical specification is so minor that no product cost differences result – the new price is directly compared to the last reported price under the former specifications and the affected index reflects any price difference. When changes in physical characteristics cause product cost differences, BLS attempts to make an accurate assessment of real price change by taking systematic account of quality differences.

Each month, BLS publishes seasonally adjusted and unadjusted data with an index value of 100 in 1982. Seasonally adjusted data are usually preferred for general analysis because they are designed to eliminate the effect of changes that occur at about the same time and with similar magnitude each year. All unadjusted indexes are routinely subject to revision only once, four months after original publication, to reflect late reports and corrections. Seasonal adjustment factors change annually.

SOURCE AGENCY

Bureau of Labor Statistics.

Comparing and Using the CPI and PPI

The CPI and PPI systems are complimentary in the sense that the CPI measures prices paid by consumers while the PPI measures prices received by producers (not retailers). Both CPI and PPI include adjustments for quality and other changes to derive pure price changes. However, the two systems are distinct and the correspondence between even the CPI goods and the PPI finished goods categories is imperfect. In other words, PPI are not simply wholesale versions of CPI. Also, the CPI aggregates (all items) are heavily influenced by service sector inflation and an imputed cost of the housing component, two areas that the PPI does not cover.

Although the CPI is often considered a "cost-of-living" index, there are serious limitations. The CPI is limited by difficulties in reflecting all changes in quality, incorporating new goods and services, and the impossibility of developing a universally-accepted market basket. Similarly, the PPI cannot capture changes in producer prices in a perfect manner and may not always accurately reflect the changes in costs experienced in all industries. The BLS cautions users to "exercise judgment accordingly concerning whether and how the data ought to be used." (Report to Congress, April 30, 1997, Katherine Abrahams, Commissioner of Labor Statistics, BLS).

For further information, see the article "Consumer and Producer Price Indexes as Inflation Indicators," *Business Cycle Indicators*, July 1997.

BCI 336 (A0M336)
Source – BLS

Producer Price Index, Finished Goods

Index (1982=100), SA

This PPI series is the price index for commodities that have reached their final stage of processing. Items can be capital equipment products purchases by manufacturers or consumer goods such as TV's or automobiles.

BCI-337 (A0M337)
Source – BLS

Producers Price Index, Finished Goods Less Foods and Energy

Index (1982=100), SA

This PPI series is the price index for all finished goods, excluding foods and energy products. This series is considered a measure of "core" inflation because it excludes the volatile food and energy product sectors.

BCI-334 (A0M334)
Source – BLS

Producer Price Index, Finished Consumer Goods

Index (1982=100), SA

This PPI series is the price index for durable and nondurable finished goods ready for use by consumers.

BCI-333 (A0M333)
Source – BLS

Producer Price Index, Capital Equipment

Index (1982=100), SA

This PPI series is the price index for commodities used in industry or commerce to produce or transport other commodities. Items such as machine tools, trucks, and farm equipment are included.

BCI-332 (A0M332)
Source – BLS

Producer Price Index, Intermediate Materials

Index (1982=100), SA

This PPI series is the price index for those partially processed commodities that require further processing before they become finished goods. They belong to the second part of the PPI stage of processing categorization (after crude materials and before finished goods).

BCI-331 (A0M331)
Source – BLS

Producer Price Index, Crude Materials for Further Processing

Index (1982=100), SA

This PPI series is a price index of materials that are entering the market economy for the first time (i.e., the initial stage of processing). These items have not been manufactured and have not undergone any processing other than that required to obtain them in their original form and prepare them for marketing and sale as a crude material. Both foodstuffs and nonfood materials are included. Some of the items that qualify for this category are wheat, slaughter cattle, raw cotton, leaf tobacco, iron ore, and crude petroleum. Waste and scrap materials that can replace raw materials and products of farms, mines, fisheries, quarries, and well operations are also included. Some crude materials that go directly to the consumer, such as certain types food and coal, are excluded.

BCI-338 (A0M338)
Source – BLS

Producer Price Index, Crude Nonfood Materials Less Energy

Index (1982=100), SA

This PPI series is in the same category as BCI-331, described above, but excludes food and energy items.

BCI-339 (A0M339)
Source – BLS

Producer Price Index, Petroleum Products

Index (1982=100), NSA

This PPI series is an industry group item that covers refined petroleum products.

C. Commodity Prices

BCI-99 (A0M099)
Source – TCB

Index of Sensitive Materials Prices

Index (1992=100), SA

OVERVIEW

This series is a composite index based on price data for 17 separate commodities and industrial materials. Prices for these raw materials is considered sensitive to changes in demand and overall industrial activity. Eight of the components are PPI commodity-based series and are described below. Nine of the components are based on data reported by the Commodity Research Bureau and are part of the BCI-23 group described later.

TECHNICAL NOTES

The methodology for producing this index is analogous to the methodology used to compute the composite leading, coincident, and lagging indexes, where each component is "normalized" or adjusted to show similar month-to-month volatility.

The components and corresponding standardization factors (based on 1959-1999 data) are: cattle hides (CHM098) 0.0358, lumber and wood products (LWM098) 0.1745, iron and steel scrap (ISM098) 0.0514, copper base scrap (CSM098) 0.0462, aluminum base scrap (ASM098) 0.0482, nonferrous scrap (NSM098) 0.0472, raw cotton (RCM098) 0.0373, domestic apparel wool (DWM098) 0.0533, lead scrap (LSM023) 0.0343, tin (TNM023) 0.0584, zinc (ZNM023) 0.0679, burlap (BLM023) 0.0581, print cloth (PCM023) 0.0692, wool tops (WTM023) 0.0567, rosin (RSM023) 0.0688, rubber (RBM023) 0.0520, and tallow (TLM023) 0.0407.

BCI-99 was originally designed and constructed by the Bureau of Economic Analysis (BEA) and has seen substantial revisions in composition and construction. Prior to the 1996 revision in the leading index, BCI-99 in smoothed percent-change form was a component of the leading index. In 1997, The Conference Board made a major revision to BCI-99, primarily by removing redundant and less reliable components. Benchmark revisions to the standardization factors are made on an annual basis, and all components are seasonally adjusted on an individual basis by The Conference Board.

PPI-Based Components of the Index of Sensitive Materials Prices

Producer Price Index, Cattle Hides	(CHM098)
Producer Price Index, Lumber and Wood Products	(LWM098)
Producer Price Index, Iron and Steel Scrap	(ISM098)
Producer Price Index, Copper Base Scrap	(CSM098)
Producer Price Index, Aluminum Base Scrap	(ASM098)
Producer Price Index, Nonferrous Scrap	(NSM098)
Producer Price Index, Raw Cotton	(RCM098)
Producer Price Index, Domestic Apparel Wool	(DWM098)

Index (1982=100), SA — Source – BLS, TCB

These series are all PPI commodity-based, and are eight of the 17 components of BCI-99. Each commodity is defined by precise BLS specifications that correspond to the title. The indexes are based on the average of prices from individual company reporters (with each reporter usually having equal weight). The ratio of the current month's average price to the previous month's average price is then applied to the previous month's index to derive the current month's index.

All data are seasonally adjusted by The Conference Board.

BCI-23 (U0M023)
Source – CRB

Index of Spot Market Prices, Raw Industrial Materials

Index (1967=100), NSA

OVERVIEW

The Commodity Research Bureau (CRB) produces an index of spot market prices for raw industrial materials that measures price movements of 13 items traded on commodity markets and organized exchanges. The components, which consist of burlap, copper scrap, cotton, hides, lead scrap, print cloth, rosin, rubber, steel scrap, tallow, tin, wool tops, and zinc, are items presumed to be among the first to be influenced by changes in economic conditions. They were chosen because they are (1) basic commodities widely used for further processing (either raw materials or products close to the initial production stage); (2) freely traded in an open market; (3) sensitive to changing conditions significant in those markets; and (4) sufficiently homogeneous or standardized that uniform and representative price quotations can be obtained over a period of time. Some commodities (such as rubber and tin), which are important in international trade, are included to reflect the influence of international markets on the economy.

The index is created from a geometric average (unweighted) of the percent change in each component's price.

TECHNICAL NOTES

This index is currently compiled by the Commodity Research Bureau on a daily basis based on the commodities and methodology initiated by BLS. "Spot" price refers to the price at which a commodity is selling for immediate delivery. When the spot price is not available, the "bid" or "asked" price is used. Some of the prices are obtained from various sources, including trade publications.

For the period prior to June 1981, the monthly indexes were created from geometric averages of weekly indexes. The weekly indexes were based on Tuesday prices, created as unweighted geometric averages of the individual commodity price relatives, and the Bureau of Labor Statistics (BLS) is the source agency for these data. Beginning with June 1981, the monthly index represents averages of daily (excluding weekends) indexes, and the CRB is the source for these data.

Spot Market Prices

Lead scrap ($ per lb.)	(LS23SA2)
Tin ($ per lb.)	(TN23SA2)
Zinc ($ per lb.)	(ZN23SA2)
Burlap ($ per yd.)	(BL23SA2)
Print cloth ($ per yd.)	(PC23SA2)
Wool tops ($ per lb.)	(WT23SA2)
Rosin ($ per 100 lb.)	(RS23SA2)
Rubber ($ per lb.)	(RB23SA2)
Tallow ($ per lb.)	(TL23SA2)
Dollars per unit, SA monthly averages	Source – CRB

Sources and Acknowledgments

The data descriptions in this section are based primarily on material originally published in the *Handbook of Cyclical Indicators*, 1984 (U.S. Department of Commerce, Bureau of Economic Analysis), and the *BLS Handbook of Methods*, 1997 (U.S. Department of Labor, Bureau of Labor Statistics).

Updating help was provided by Mr. Kenneth Stewart (Division of Consumer Prices and Price Indexes, U.S. Department of Labor, Bureau of Labor Statistics, Washington, D.C.), Mr. Elliott Rosenberg (Division of Industrial Prices and Price Indexes, U.S. Department of Labor, Bureau of Labor Statistics, Washington, D.C.) and Mr. Chris Lown (BRIDGE-Commodity Research Bureau, Chicago).

Further information can also be obtained from these Web sites:

CPI: Bureau of Labor Statistics: www.bls.gov/cpihome.htm
PPI: Bureau of Labor Statistics: www.bls.gov/ppihome.htm
CRB: Commodities Research Bureau: www.crbindex.com

Money, Credit, Interest Rates, and Stock Prices

A. Monetary Aggregates (Reserves and Money Supply)

OVERVIEW

Aggregate measures of monetary assets, often referred to as the money supply, have long played an important role in the analysis of the business cycle and the more general macroeconomy. Monetary aggregates are considered important indicators for the economy's financial system because they are either directly or indirectly affected by both Federal Reserve policy (usually showing an inverse relationship with interest rates) and private demand for credit and liquidity.

The "money" category includes reserve holdings of banks, borrowings from the Federal Reserve System, and various types of money or liquid assets held by the nonbank public (usually excluding amounts held by foreign banks and official institutions, the U.S. government, domestic depository institutions, and money market mutual funds). The economists' definition of money is based on its functions: (1) medium of exchange, (2) unit of account, (3) store of value, and (4) standard of deferred value, but no single measure is accepted by all economists.

The three most studied measures of money–M1, M2, and M3–are progressively more inclusive (i.e., all items in M1 are included in M2, and all items in M2 are included in M3). M1 consists of the most liquid forms of money, namely currency and checkable deposits. The non-M1 components of M2 are primarily the savings and time deposits of households and retail money market mutual funds. The non-M2 components of M3 consist of institutional money funds and certain managed liabilities of depositories, namely large time deposits, repurchase agreements, and eurodollars.

M2 generally receives the greatest attention and is used as a component of the leading index, after adjusting for general price inflation: Money Supply, M2 in 1992 dollars (BCI-106). At one time M1 was considered the most important monetary aggregate. It was followed very closely by the Fed as a leading indicator of inflation, and was used as a component of the leading index. Both M1 and M2 are still used as inflation indicators, but their reliability in this regard has been questioned.

TECHNICAL NOTES

Currency includes coins and dollar bills (i.e., paper money). Coins are a monetary liability of the U.S. Treasury, while dollar bills are Federal Reserve Notes and are issued by the Federal Reserve System (the U.S. central bank, which is autonomous from the U.S. Treasury). Both forms of currency are termed "fiat" money because they are deemed legal tender by the U.S. government, but an exchange for gold or some other commodity money is not guaranteed, and they are readily accepted as a medium of exchange by the public. Currency in circulation is paper currency and coin held outside the Treasury and the Federal Reserve banks, including cash held by depository institutions. The public holdings of currency exclude holdings in the vaults of depository institutions.

Total reserves are the sum of reserve balances and the portion of their vault cash that depository institutions use to meet their reserve requirements. Reserve holdings are measured (either directly reported or estimated) for all depository institutions. Required reserves are minimum balances that must be maintained by depository institutions pursuant to Federal Reserve regulations. These reserve requirements, which can be changed by the Board of Governors of the Federal Reserve System, are specified as percentages of deposit liabilities and vary by type of deposits. Reserve requirements can be met by reserve balances and by vault cash held by depository institutions at Federal Reserve banks. (Prior to December 1959, the only permissible legal reserves were balances with the Federal Reserve.) Excess reserves are the difference between total reserves and required reserves, and free reserves are the difference between excess reserves and borrowings from the Federal Reserve System. Borrowings are the amount banks borrow from the Federal Reserve's discount window to meet their individual required reserves and seasonal demands for cash (typically on an irregular and temporary basis). Required clearing balances are holdings at the Federal Reserve for purposes of clearing payments, and are not included in reserve balances.

M1 includes almost all of the currency portion of the monetary base (excluding bank reserves and currency held at the U.S. Treasury, Federal Reserve banks, and the vaults of depository institutions), M2 includes all M1 items, M3 includes all M2 items. The additional items in M1, M2, and M3 are specified below in the definition of each series. In these definitions, demand

deposits refer to checking accounts that are subject to almost immediate withdrawal (i.e., an individual cashes a check at a bank). Banks may ask for notice (but rarely do) before honoring a withdrawal request from most savings accounts and time deposits, such as certificates of deposits.

The monetary aggregates are published in both seasonally adjusted and unadjusted form. Seasonally adjusted data are preferred for analyzing the general health of the economy, especially the financial and banking sector, because they are designed to eliminate the effect of changes that occur at about the same time and with similar magnitude each year. The Federal Reserve re-adjusts the seasonal factors on an annual basis.

The BCI only reports monthly values for the money stock data, which are typically based on averages of the daily figures (close-of-day) reported by depository institutions to the Federal Reserve. Estimates of M1, M2, and M3 are also available on a weekly basis.

SOURCE AGENCY

Board of Governors of the Federal Reserve System (FRB). The data are published in *Money Stock, Liquid Assets, and Debt Measures* (H.6), and *Aggregate Reserves of Depository Institutions and the Monetary Base* (H.3), a weekly Federal Reserve statistical release. Monthly data are available back to January 1959 for most series (exceptions noted).

BCI-93 (U0M093)
Source – FRB, TCB

Free Reserves

Millions ($), NSA

This series measures the difference between the excess reserves of depository institutions and their borrowings from the Federal Reserve System. When excess reserves exceed total borrowings, the difference is termed "free reserves." Conversely, when borrowings exceed excess reserves, the difference is termed "net borrowed reserves." This series is not adjusted for changes in reserve requirements.

BCI-94 (U0M094)
Source – FRB

Bank Borrowings (from Federal Reserve)

Millions ($), NSA

This series measures the amount that depository institutions have borrowed from the discount window at Federal Reserve banks. The borrowing is usually done to obtain reserve funds needed to cover required reserves on a temporary basis. This series is not adjusted for changes in reserve requirements, and begins in 1947.

BCI-96 (A0M096)
Source – FRB

Nonborrowed Reserves

Millions ($), SA

Nonborrowed reserves is the sum of reserve balances and vault cash held by depository institutions (with adjustments for certain aspects of lagged reserve accounting regulations) less reserve balances borrowed from the Federal Reserve. This series also includes an adjustment for changes in reserve requirements.

BCI-140 (A0M140)
Source – FRB

Monetary Base

Millions ($), SA

This series consists of total reserves, the currency component of the money stock, required clearing balances, and a modified version of surplus vault cash. The vault cash component reflects the difference between current vault cash and the amount applied to satisfy current reserve requirements (using data from all depository institutions that report their deposits and reserves on a weekly basis, and whose vault cash exceeds their required reserves). This series is also adjusted for changes in reserve requirements.

BCI-146 (A0M146)
Source – FRB

Currency Held By Public

Billions ($), SA

This series, the currency component of the money stock, measures all coins and paper bills in public circulation or held outside of the U.S. Treasury, Federal Reserve banks and the vaults of depository institutions.

BCI-141 (A0M141)
Source – FRB

Money Supply, M1

Billions ($), SA

The M1 measure of the money supply consists of: (1) currency held by the public; (2) travelers checks; (3) demand deposits; and (4) other checkable deposits (OCDs), consisting of negotiable order of withdrawal (NOW) and automatic transfer service (ATS) accounts at depository institutions, credit union shares, draft accounts, and demand deposits at thrift institutions.

BCI-142 (A0M142)
Source – FRB

Money Supply, M2

Billions ($), SA

The M2 measure of the money supply consists of M1 plus: (1) savings deposits (including money market deposit accounts); (2) time deposits in amounts of less than $100,000; and (3) balances in retail money market mutual funds. M2 excludes individual retirement account (IRA) and Keogh balances at depository institutions, and money market funds. The six-month growth rate of this series can be found in the BCI database under the mnemonic A6M142.

BCI-143 (A0M143)
Source – FRB

Money Supply, M3

Billions ($), SA

The M3 measure of the money supply consists of M2 plus: (1) time deposits of $100,000 or more at all depository institutions; (2) balances in money market mutual funds restricted to institutional investors; (3) term repurchase agreements in amounts of $100,000 or more; and (4) eurodollars.

BCI-106 (A0M106)
Source – FRB, TCB

Real Money Supply, M2

Billions (chained 96$), SA

This series measures money supply, M2 (as described above), in chain-weighted 1996 dollars. The deflation calculation uses the implicit chain-weighted price index for personal consumption expenditures (PCE).

BCI-108 (A0M108)
Source – BEA, FRB, TCB

Ratio, Personal Income to Money Supply, M2

Percent, SA

This series is a measure of the velocity of money. It is computed as the ratio of personal income (BCI-223) to money supply, M2 (BCI-142). This series begins in 1947.

B. Outstanding Debt and Credit Flows

BCI-66 (A0M066)
Source – FRB

Consumer Installment Credit Outstanding

Billions ($), SA

This series measures the amount of consumer installment credit outstanding at the end of each month. It covers most short- and intermediate-term credit extended to individuals, excluding loans secured by real estate, and includes consumer credit held by financial institutions, retail outlets, and gasoline companies that is scheduled to be repaid, or with the option of repayment, in two or more installments.

TECHNICAL NOTES

Financial institutions hold about 90 percent of the reported consumer credit outstanding, while retail outlets and gasoline companies hold most of the remainder. Specific categories of consumer credit are automobile paper, including both direct and indirect loans (purchased paper); revolving credit; mobile home credit; and "other" installment loans, which include loans for home improvement, other consumer goods, and personal cash loans. Home mortgage financing generally is excluded.

Estimates are based on comprehensive benchmark data that become available periodically, and monthly sample data obtained through the cooperation of lenders and other credit grantors. The monthly sample is used to interpolate estimates between benchmarks and to extrapolate estimates from the latest benchmark. The major portion of financial institution data is obtained from Federal Reserve banks, the National Association of Mutual Savings Banks, the Federal Home Loan Bank Board, and reports of finance companies. Retail outlet data are estimated from the U.S. Department of Commerce, Bureau of the Census surveys of sales and accounts receivable.

SOURCE AGENCY

Board of Governors of the Federal Reserve System (FRB). These data are published in *Consumer Credit* (G.19), a Federal Reserve statistical release and begin in 1943.

BCI-113 (A0M113)
Source – FRB, TCB

Net Change in Consumer Installment Credit

Billions ($), SAAR

This series measures the change during the month in the amount of consumer installment credit outstanding (BCI-66). It is defined as the amount of consumer installment credit extended less the amount liquidated (including repayments, charge-offs, and other credits) during the month. Each monthly change is computed by subtracting the amount outstanding at the end of the previous month from the amount outstanding at the end of the current month.

BCI-095 (A0M095)
Source – FRB, BEA, TCB

Ratio, Consumer Installment Credit Outstanding to Personal Income

Percent, SA

This series is the ratio of the amount of consumer installment credit outstanding (BCI-66) to a personal income series derived from BCI-223 (this denominator is adjusted for a few anomalous, temporary spikes).

BCI-72 (A0M072)
Source – FRB

Commercial and Industrial Loans Outstanding

Millions ($), SA

This series provides fairly comprehensive measure of the amount of short-term business loans outstanding per month. BCI-72 is compiled by summing two components: (1) Balances outstanding on loans for commercial and industrial purposes held by large domestic commercial banks; and (2) commercial paper issued by nonfinancial companies. (Prior to January 1988, loans sold outright by large domestic commercial banks were also included in the summation. This and other discontinuities are discussed below.)

TECHNICAL NOTES

The data for *commercial and industrial loans held by commercial banks* are collected by the Board of Governors of the Federal Reserve System. These reports cover the amount of bank-held commercial and industrial loans outstanding as of each Wednesday. The monthly average is calculated by the Board of Governors.

The data for *commercial paper issued by nonfinancial companies* include high-grade, unsecured, short-term, negotiable, promissory notes issued by major nonbank corporations and sold through dealers or directly to investors – usually other companies. Nonfinancial companies include public utilities and companies engaged primarily in communications, construction, manufacturing, mining, wholesale and retail trade, transportation, and services.

The Board of Governors receives data transmitted electronically from The Depository Trust Company (DTC) of New York City which has calculated and provided the series since January 1991. Prior to January 1991, the data were formally compiled and seasonally adjusted by the Federal Reserve Bank of New York from data that were collected primarily from ten commercial paper dealers (brokers) who reported all commercial paper they handled. Additional data were obtained from about 37 firms that made direct (i.e., nonbroker) issues of commercial paper in excess of $100 million. The data referred to the last Wednesday of the month.

The series has some minor discontinuities (that resulted from changes in the way the Board of Governors compiled the data and the number of banks covered) and two major discontinuities, one in January 1972, and another in January 1988.

SOURCE AGENCY

Board of Governors of the Federal Reserve System (FRB). The data are published in *Assets and Liabilities of Commercial Banks in the United States* (H.8), a weekly Federal Reserve Statistical Release and *Commercial Paper*, a weekly Federal Reserve Statistical Release. This series began in 1959.

BCI-101 (A0M101)
Source – FRB, TCB

Commercial and Industrial Loans Outstanding in 1992 Dollars

Millions (chained 92$), SA

This series measures commercial and industrial loans, (as described earlier) in chain-weighted, 1992 dollars. The deflation calculation uses the implicit chain-weighted price index for personal consumption expenditures (PCE). This series begins in 1959.

BCI-112 (A0M112)
Source – FRB, TCB

Net Change in Business Loans

Billions, SAAR

This series measures the month-to-month change in commercial and industrial loans (BCI-72) and is stated in billions of dollars.

C. Interest Rates and Bond Yields

OVERVIEW

There are two major interest rate classifications in the BCI database that cover both government and private securities: (1) short-term rates that measure the interest charged or earned on securities and loans with maturity up to 12 months; and (2) longer-term bond yields (with maturities of over one year) that reflect the interest return on fixed-interest securities in the secondary markets. Most of the series are averages of rates for all days of the month.

TECHNICAL NOTES

Although the concept of an interest rate (i.e., the annualized, nominal rate of return earned by a lender or holder of a financial security) is fairly straightforward, there are various technical aspects involved in the calculation of each series. These technical aspects (discussed along with each series) mainly reflect the fact that the rates are based on averages for numerous individual securities and transactions. Also, many securities are sold and traded at values different from their par or redemption value, even if they pay a regular coupon rate, and this affects their yield to maturity.

These series show no predictable seasonal variation and, therefore, are not seasonally adjusted.

SOURCE AGENCY

The published source for almost all BCI interest rate series is the Board of Governors of the Federal Reserve System (FRB) and these FRB data are gathered from numerous market-based sources. See Selected Interest Rates (H.15), a weekly Federal Reserve statistical release, and Selected Interest Rates (G.13), a monthly Federal Reserve statistical release.

BCI-119 (U0M119)
Source – FRB

Federal Funds Rate

Percent, NSA

The Federal funds rate is the average daily rate charged by depository institutions on an overnight sale of Federal funds to another depository institution. In essence, it reflects the rate that banks charge when lending their excess reserves to other bank that needs to borrow to balance cash flows and to meet their reserve requirements. Although this rate is often an explicit target of the Fed, it varies from day to day and from bank to bank, depending on fluctuations in the demand and supply of bank reserves.

TECHNICAL NOTES

The Federal funds rate measures the interest rate charged on unsecured, overnight borrowing of immediately available funds in the brokered market. Such transactions, which are made by depository institutions, U.S. government agencies, and some other institutions, result in the transfer of ownership of balances held at the Federal Reserve.

The Federal funds rate is expressed in annual terms and is calculated on a 360-day year, so that the actual interest charge for one day is 1/360 of the federal funds rate. Through contacts with Federal funds brokers, the Federal Reserve Bank of New York determines an effective Federal funds rate each day. The effective rate for nonbusiness days (weekends and holidays) is the rate for the previous business day.

Through the week ending July 18, 1973, the daily effective rate reflects the most representative rate of the day. Since then it is an average of rates charged on a given day, weighted by volume, on trades through New York brokers. The monthly series is the average of daily effective rates for the month and includes each calendar day.

BCI-114 (U0M114)
Source – Treasury, FRB

Discount Rate on New 90-Day Treasury Bills

Percent, NSA

This series measures the rate of interest set in the weekly auctions of new 90-day Treasury bills, and is computed on a bank discount basis. (Treasury bills do not pay an explicit coupon rate. Instead, they are sold at a discount from their face or maturity value and the effective rate of interest is inversely related to the size of the discount.)

TECHNICAL NOTES

BCI-114 is the average of the four or five weekly auction rates for each month. In the auctions conducted by the Federal Reserve for the U.S. Treasury, each potential buyer specifies the discount rate he is willing to pay, and the amount of bills he wishes to buy.

These auction rates are similar to, but not the same as, rates in the secondary market; the latter are rates on outstanding Treasury bills, based on daily trading quotations. The rates for the new Treasury bills are computed using the date of issue of the bills, usually a Thursday, even though the auction usually occurs on the Monday of that week or, at times, on Friday of the preceding week. Therefore, the monthly average of weekly rates sometimes includes the results of an auction that occurred late in the preceding month.

Starting in November 1998, BCI-114 is based on the highest rate among successful competitive bids (referred to as the auction high or stop yield). Prior to November 1998, BCI-114 is based on a weighted average of the yields at which the various portions of the issue are sold. The change in the computing method reflects a change in the auction procedures (i.e., the Treasury moved from a multiple-price auction format to a single-price auction format for bills in November 1998). Some refer to the new format as a Dutch auction. Two- and five-year notes had been successfully auctioned in this manner since the early 1990s and Treasury has now expanded the single-price format to auctions for all Treasury securities.

BCI-116 (U0M116)
Source – Citibank, Treasury

Yield on New High-Grade Corporate Bonds

Percent, NSA

This series is an average or representative interest rate for corporate bonds issued by companies with high credit ratings (i.e., low risk of default). It is measured as the yield to maturity, which adjusts for the fact that these bonds are often sold at, above, or below their par value.

TECHNICAL NOTES

For the period 1948-1959, BCI-116 is a weighted average of the reoffering yields on new high-grade corporate bonds offered during the month, weighted by the size of the offerings. The series includes new public offerings rated Aaa, Aa, or A by Moody's Investors Service, with the exception of serial bonds, convertible debentures, equipment trust certificates, and offerings by natural gas transmission or foreign companies. Before averaging, the yields on Aa and A issues are adjusted to the level of the Aaa yields. The adjustments are based on the difference between average yields of these corporate bonds and the Aaa bonds outstanding during the month reported by Moody's. The series was computed by Citibank (formerly the First National City Bank of New York).

Beginning in 1960, BCI-116 is an estimated monthly average of the re-offering yields on new Aa bonds having an original maturity of at least 20 years, and is based on weekly computations by the U.S. Department of the Treasury. Prior to June 1973, the series is adjusted to reflect bonds without call protection; From June 1973 to July 1976, it is based on bonds with five-year call protection; and since July 1976, it reflects bond yields regardless of the call protection offered. It excludes the same offerings as the Citibank series, except for natural gas transmission companies, which are included in the Treasury data. Although Aa bonds are not the most common among the quality ratings, they are numerous enough to provide a meaningful series.

BCI-115 (U0M115)
Source – Treasury, FRB

Yield on Long-Term Treasury Bonds

Percent, NSA

This series measures the unweighted average yield on fully taxable Treasury bonds that are neither due nor callable for a specified number of years (currently 10 years).

TECHNICAL NOTES

These bond yields are currently computed by the U.S. Department of the Treasury, based on prices reported to it by the Federal Reserve Bank of New York. The monthly data are averages of yields for business days in the month. Yields are based on a composite of daily closing bid quotations.

BCI-117 (U0M117)
Source – FRB

Yield on Municipal Bonds, 20-Bond Average

Percent, NSA

This yield on municipal bonds is an average based on *The Bond Buyer* weekly index of yields for 20 new municipal bonds.

TECHNICAL NOTES

The Bond Buyer Index is an average of the yields of general obligation bonds of 20 issuing bodies that include states, cities, and school districts. The computations are not necessarily based on specific issues. The yields used are those applicable to bonds selling near par with about 20 years to maturity. Issues rated in the top five classifications by Moody's Investors Service are used, with concentration in the second and third classes. Substitutions in the list of issuing bodies are made occasionally to keep the index abreast of the market.

BCI-118 (U0M118)
Source – HUD

Secondary Market Yields on FHA Mortgages*

Percent, NSA

This series is based on a national survey of secondary-market prices and average yields for home loans that are insured by the Federal Housing Administration (FHA).

TECHNICAL NOTES

The FHA-insured home loan rates are obtained from a survey of home loan market conditions conducted by officials in 70 Housing and Urban Development (HUD) Field Offices on the first of each month. The value that HUD reports for the first of the month is used as the BCI-118 value for the prior month.

Prior to 1996, BCI-118 was compiled by BEA from HUD reports, with some supplementation from FRB reports. There a few reporting gaps in the data (e.g., January 1970, January and February 1971, etc.) that the FRB describes as "periods of adjustment to changes in maximum permissible contract rates." HUD reports are solely used for updating this series.

The HUD reports are based upon transactions for immediate delivery in the secondary market, and represent home loans with a 30-year maturity based on prepayment of the mortgage at the end of 12 years. Information is obtained from over 240 lending institutions and builders located in major metropolitan areas across the country.

*HUD discontinued series in June 2000.

BCI-109 (U0M109)
Source – FRB

Average Prime Rate Charged by Banks

Percent, NSA

The "prime rate" charged by banks is one of several base interest rates used by banks to price short-term business loans. At one time, the prime rate was thought of as the rate charged to the bank's best business customers, but changes in financial markets have made this rate less relevant for business borrowing. Many banks still use the prime rate as a base for pricing all types of credit, including home equity and credit card loans. Because it is an administered rate, changes in the bank prime rate are less frequent than changes in money market rates and tend to occur in increments of at least one-quarter of a percentage point.

TECHNICAL NOTES

The Federal Reserve Board monitors the prime rates posted by the 25 largest banks in the country, ranked by assets. Announcements of changes in the prime rate at these banks are obtained from the wire services, and the rate posted by a majority of the 25 banks is recorded each day as the predominant prime rate. The monthly data are averages of rates for all the days of the month. The rate used for weekends and holidays is the rate for the previous business day.

BCI-131 (U0M131)
Source – FRB

Yield On 10-Year Treasury Bonds

Percent, NSA

This interest rate measures the yield of 10-year Treasury bonds, using a constant-maturity concept that averages yields on bonds traded in the secondary market that have close to ten years remaining until maturity to estimate the yield on a bond with exactly ten years remaining until maturity. (Often, no actual security has exactly ten years remaining.)

TECHNICAL NOTES

The U.S. Treasury monitors changes in the secondary trading market for government securities by calculating "constant-maturity yields" for the most actively-traded Treasury securities. Price quotes are gathered by the Federal Reserve Bank of New York, which passes them on to the Treasury. Using all quotes, the Treasury interpolates a smooth yield curve, influenced most heavily by yields on current-coupon issues, so that a value can be read for the 10-year maturity, even if no actual security has exactly ten years remaining. The monthly data are averages of estimated rates for all business days in the month.

BCI-129 (U0M129)
Source – FRB, TCB

Interest Rate Spread, 10-Year Bonds less Federal Funds

Percent, NSA

This series measures the spread or difference between the 10-year Treasury bond rate (BCI- 131) and the Federal funds rate (BCI-119). It is a component of the leading index because it is felt to be a reliable indicator of the stance of monetary policy, rising when short rates are pushed low relative to long rates and inflation expectations, and falling when short rates are pushed high relative to long rates and inflation expectations.

D. Stock Prices

BCI-19 (U0M019)
Source – S&P

S&P 500 Common Stock Index

Index (1941-43=10), NSA

This series is an index that measures the price performance of a broad cross-section of the U.S. equity market. It includes 500 of the most commonly traded stocks on the New York Stock Exchange, the American Stock Exchange, and the NASDAQ National Market System. The S&P 500 index weights each stock by the number of shares outstanding. BCI-19 is an average of each trading day in the month (the daily values are based on closing prices) and has been a component of the leading index since its inception.

TECHNICAL NOTES

The basic format of the S&P 500 index was first introduced in 1957. After weighting the price of each stock by the number of shares outstanding, this aggregate current market value is expressed as a ratio of the aggregate market value in the base period (1941-43) and multiplied by 10. The index is modified to offset unusual capitalization changes due to corporate actions such as spin-offs and mergers, however, and the set of 500 stocks used to compute the index is regularly reevaluated and changed to better reflect the most commonly traded stocks. (Historical data are restated to reflect these changes in order to avoid a selection bias that would overstate actual investment performance.)

Selection of stocks for addition to or removal from the index is currently the responsibility of the Standard & Poor's Index Committee. Each stock in the index must represent a viable enterprise typical of the industry group to which it is assigned, and its market price movements must be responsive to changes in the industry. Given a choice among a number of stocks meeting these criteria, preference is generally given to the stocks with the largest aggregate market value – usually these are also the more actively traded issues.

The most significant changes occurred in 1976 and 1988. In July 1976, the index was revised to include some over-the-counter stocks, mainly bank and insurance stocks. Before the revision, three groups were represented: 425 industrials, 60 utilities, and 15 rails. The revised index comprised four groups: 400 industrials, 40 utilities, 20 transportation, and 40 financial. Forty-five stocks from the old index were also replaced. In April 1988, Standard & Poor's removed the fixed-number structure set on the four major industry sectors, permitting the index to be more responsive to shifts in representation of major market sectors.

Sources and Acknowledgments

The data descriptions in this section are based primarily on material originally published in the *Handbook of Cyclical Indicators*, 1984 (U.S. Department of Commerce, Bureau of Economic Analysis) and *Selected Interest Rates* (G13), a monthly Federal Reserve statistical release.

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Further information can also be obtained from these Web sites:

Board of Governors of the Federal Reserve System home page:
www.bog.frb.fed.us
Federal Reserve Board Statistics: Releases and Historical Data
www.bog.frb.fed.us/releases/

Housing and Urban Development home page
www.hud.gov/ (also see http://www.hud.gov:80/fha/comp/rpts/fharpts.html)

Additional Indicators:

BCI-122 (A0M122)
BCI-123 (A0M123)
Source – TCB

Consumer Confidence
Consumer Expectations

Index (1985=100), SA

As part of their monthly Consumer Confidence Survey, The Conference Board's Consumer Research Center produces indexes that measure public impressions and attitudes about the economy. The survey questions cover general business conditions, employment conditions, and expectations about family income.

The consumer confidence index (BCI-122) is created from an equally-weighted average of consumer responses to five questions about: (1) current business conditions; (2) business conditions six months hence; (3) current employment conditions; (4) expectations regarding employment conditions six months hence; and (5) expectations regarding total family income six months hence.

The consumer expectations index (BCI-123) is created from an equally-weighted average of consumer responses to questions (2), (4), and (5). In other words, the consumer expectations index differs from the consumer confidence index in that the latter summarizes responses to questions that cover both current and future conditions, while the former summarizes results from the three questions that concentrate on the future (six months hence).

Both indexes include adjustments for predictable seasonal variation. (See Technical Notes below for additional details about their construction.)

TECHNICAL NOTES

The Consumer Confidence Survey is conducted for The Conference Board by NFO Research, Inc. an NFO Worldwide Company and member of The Interpublic Group of Companies (NYSE: IPG). Results are from questionnaires that are mailed to a nationwide representative sample of 5,000 households (roughly 3,500 typically respond). A different panel of households is surveyed each month.

The Confidence Index is based on responses to five questions included in the survey:

1. Respondents' appraisal of current business conditions.
2. Respondents' expectations regarding business conditions six months hence.
3. Respondents' appraisal of current employment conditions.
4. Respondents' expectations regarding employment conditions six months hence.
5. Respondents' expectations regarding total family income six months hence.

For each of the five questions, there are three response options: positive, negative, and neutral. In addition, for each of these five questions, the positive figure is divided by the sum of the positive and negative to yield a proportion, called the relative value. For each question, the average relative for the calendar year 1985 is used as a benchmark to yield the index value for that question, and seasonally adjusted. The Consumer Confidence Index is a simple average of the individual indexes created from responses to the five questions above. The Consumer Expectations Index is a simple average of the indexes based on three forward-looking questions (responses to questions 2, 4, and 5), and also includes adjustment for predictable seasonal variation.

The questions asked to compute the indexes have remained constant throughout the history of the series. Seasonal adjustments are made to responses to each question (before aggregation).

SOURCE AGENCY

The Conference Board's Consumer Research Center (TCB-CRC). Bi-monthly data are available from 1967 through May 1977, and monthly data are available beginning June 1977.

BCI-46 (A0M046)
Source – TCB

Index of Help-Wanted Advertising

Index (1987=100), SA

The Conference Board's index of help-wanted advertising measures the volume of newspaper advertisements for open positions and, therefore, is related to employers demand for labor. The index is constructed to reflect both the relative level and the monthly change in the number of job openings resulting from vacancies in existing jobs, or the creation of new jobs.

TECHNICAL NOTES

The help-wanted advertising data are based on the monthly volume of help-wanted ads published in the classified section of one newspaper in each of 51 sample cities. Each city represents a major labor market area, as defined by the Bureau of Labor Statistics. The criteria used to select the newspaper within each city are the representativeness and coverage of the classified advertising for that particular area. Employment in the sample cities accounted for slightly more than half of U.S. nonagricultural employment in 1971.

The monthly advertising volume for each city is adjusted for differences in the number of Sundays and the number of days per month is adjusted for seasonal variations, and is converted to an index (1987=100). Each index is weighted by the city's proportion of nonagricultural employment in the sample cities, and combined into regional and national indexes. Data begins in 1951. Prior to 1971, the sample included 52 cities.

BCI-60 (A0M060)
Source – TCB, BLS

Ratio of Index of Help-Wanted Advertising to Number of Persons Unemployed

Percent, SA

This series measures the number of advertised jobs available relative to the number of persons unemployed. It is computed by dividing the index of help-wanted advertising (BCI-46) by an index form of the number of persons unemployed (BCI-37, 1987=100).

SOURCE AGENCY

The Conference Board. Data are available monthly starting in 1951.

BCI-58 (U0M058)
BCI-83 (U0M083)
Source – UM

Consumer Sentiment (copyrighted by UM)
Consumer Expectations (copyrighted by UM)

Index (IQ 1966=100), NSA

The University of Michigan's consumer sentiment and consumer expectations indexes are based on a cross-section sample of households. The sample is selected to be nationally representative of the opinions of the typical U.S. consumer and the resulting indexes.

The *Index of Consumer Sentiment* (BCI-58) measures public opinion about personal finances, business conditions, and buying conditions. The *Index of Consumer Expectations* (BCI-83) focuses on three specific outlook areas that affect consumer sentiment: how consumers view prospects for their own financial situation; how they view prospects for the general economy over the near term; and their view of prospects for the economy over the long term. (See technical notes below for details about the construction of these indexes.)

The *Consumer Expectations Index* (BCI-83) was added to the leading index in 1989.

TECHNICAL NOTES

The University of Michigan's "Survey of Consumers" is an ongoing monthly survey, based on telephone interviews with approximately 500 adult men and women living in the contiguous 48 states and the District of Columbia. The nationwide sample utilizes a rotating panel design where many respondents are re-interviewed six months after first being selected and interviewed. The total sample for any one survey is normally made up of 60 percent new respondents (with the remaining 40 percent being interviewed for a second time).

The survey results include responses to five questions:

1. An opinion on the financial condition of the respondent's family at present, compared to a year earlier.
2. An opinion on the financial condition of the respondent's family one year hence, compared to the present
3. An opinion on business conditions in the U.S. during next 12 months.
4. An opinion on business conditions in the U.S. during the next five years.
5. Whether the present is a good or bad time to purchase consumer durables.

The responses are grouped into three categories: (a) up, better, or good; (b) same, no change, or uncertain; and (c) down, worse, or bad. For each question, the proportion of "down" responses is subtracted from the proportion of "up" responses, and, to avoid negative numbers, 100 is added to this difference. The results for each of the five questions are averaged (unweighted) and the average is converted to an index with the first quarter of 1966 equaling 100. Beginning with 1960, 2.7 is added to each index. This adjusts the current indexes, which are based on responses from any adult in a household, to the level of indexes for the earlier period, when the respondents included heads of households only. Beginning with December 1981, this factor was changed to 2.0 to reflect the adoption of a new method of weighting respondents by age and income.

BCI-58 and BCI-83 are not seasonally adjusted. Differences in the index values exceeding1.3 points are considered significant at the one standard error level.

The data were originally reported on a quarterly basis for the period 1952 through 1977, based on sample sizes ranging from 1,200 to 2,000. Beginning with 1978, the data are monthly, based on surveys of 500 to 800 respondents. The questions asked in the monthly and quarterly surveys are the same and, therefore, comparable.

SOURCE AGENCY

The University of Michigan (UM). BCI-58 and BCI-83 data begin in IIIQ 1952. In the BCI database, quarterly data for BCI-58 have been placed in the middle month of each quarter in the 1952-1977 period, with some missing (unreported) quarters in the 1953-1958 period. The BEA created a full set of interpolated monthly data for BCI-83 when it was added to the leading index in 1989.

BCI-13 (A0M013)
Source – D & B

Number of New Business Incorporations (copyrighted by D&B)*

SA

This series measures the number of domestic stock profit companies receiving charters each month under the general business incorporation laws of the 50 states and the District of Columbia. New incorporations include completely new businesses that are incorporated, existing businesses that are changed from a noncorporate to a corporate form of organization, existing corporations that have been given certificates of authority to also operate in another state, and existing corporations transferred to a new state.

BCI-14 (U0M014)
Source – D & B

Total Liabilities of Business Failures (copyrighted by D&B)*

Millions ($), NSA

This series measures the liabilities of business failures, which approximate the total obligations of concerns "involved in a court proceeding or a voluntary action that is likely to end in loss to creditors." Total liabilities include accounts and notes payable and obligations, whether in secured form or not, known to be held by banks, officers, affiliated companies, supplying companies, or the government. They do not include long-term publicly held obligations, and no adjustments are made for offsetting assets.

TECHNICAL NOTES

Dun & Bradstreet staff collects new incorporations data from the Secretary of State of each state government and then computes seasonal adjustments to account for predictable seasonal variation.

Dun & Bradstreet also collects extensive data on business failures throughout the 50 states and the District of Columbia. Business failures include industrial and commercial enterprises that are petitioned into Federal Bankruptcy Courts; concerns that are forced out of business through actions in state courts, such as foreclosure, execution, and attachments with insufficient assets to cover all claims; concerns involved in court actions, such as receivership, reorganization, or arrangement; voluntary discontinuances with known loss to creditors; and voluntary compromises with creditors out of court, where obtainable.

Dun & Bradstreet reporters make daily checks of court records for court-action cases. Data for noncourt cases are collected from local credit management groups and boards of trade, and by the reporters who make regular rounds of interviews and note closings of stores that leave unpaid credit commitments. The reporters also scan sales notices in newspapers, attachments, sheriff's sales, and auctions. The statistics are compiled by combining these reports. The series is inversely related to broad movements in aggregate economic activity.

The business failures series was revised in 1984 by adding the following industry sectors to the failure coverage: agriculture, forestry and fishing; finance, insurance and real estate; and the services sector in its entirety. All industries in the U.S. are now represented in Dun & Bradstreet's business failure coverage. In recent years, approximately 97 percent of the failures involve liabilities of less than $1 million.

SOURCE AGENCY

Dun & Bradstreet. The BCI-13 data begins in 1947 covering the 48 contiguous states. Hawaii was added in 1958, Alaska in 1960, and the District of Columbia in 1963. The BCI-14 data begin in 1945, but data prior to 1984 are not directly comparable to the current series.

*Please Note: Data series no longer published by D&B.

BCI-130 (A0M130)
Source – NAPM

NAPM Purchasing Managers' Index

Percent, SA

The National Association of Purchasing Managers (NAPM) conducts a monthly survey of purchasing executives in more than 300 industrial companies and summarizes the results in the NAPM Report on Business®. The headline number, the Purchasing Managers' Index (PMI), is a composite series that is constructed from five separately reported and seasonally adjusted diffusion indexes using unequal weights. Descriptions of each subcomponent (production, new orders, supplier deliveries, inventories, and employment) follow. (See technical notes for construction details and the component weights.)

A PMI reading above 50 percent indicates that the manufacturing economy is generally expanding; below 50 percent, that it is generally declining.

BCI-132 (A0M132)
Source – NAPM

NAPM Production Index

Percent, SA

This component of NAPM's PMI is a diffusion index that measures the percent of purchasing executives that reported positive growth in production, and one-half of those reporting the same production as the previous month.

BCI-133 (A0M133)
Source – NAPM

NAPM New Orders Index

Percent, SA

This component of NAPM's PMI is a diffusion index that measures the percent of purchasing executives that reported positive growth in new orders received, and one-half of those reporting the same number of new orders as the previous month.

BCI-32 (A0M032)
Source – NAPM

Vendor Performance (NAPM Slower Deliveries Index)

Percent, SA

This NAPM measure of vendor performance reports the percentage of purchasing agents who reported slower deliveries in the current month compared with the previous month. It tends to reflect the volume of business being handled by suppliers of these firms, with slower deliveries usually indicating a higher volume of business. BCI-32 is a component of both the PMI and the leading index.

BCI-135 (A0M135)
Source – NAPM

NAPM Inventories Index

Percent, SA

This component of NAPM's PMI is a diffusion index that measures the percent of purchasing executives that reported positive growth in inventories, and one-half of those reporting the same level of inventories as the previous month.

BCI-136 (A0M136)
Source – NAPM

NAPM Employment Index

Percent, SA

This component of NAPM's PMI is a diffusion index that measures the percent of purchasing executives that reported positive growth in employment, and one-half of those resorting the same as the previous month.

TECHNICAL NOTES

The NAPM indexes are based on data compiled from monthly replies to questions asked of purchasing executives in more than 300 industrial companies. Membership of the NAPM Business Survey Committee is diversified by Standard Industrial Classification (SIC) category, based on each industry's contribution to gross domestic product (GDP). Twenty industries in 50 states are represented on the committee.

All of the PMI components are diffusion indexes, and the results are not weighted by the size of respondent's firm or operation. Each index shows the percent of positive responses (higher, better, and slower for supplier deliveries), and one-half of those responding the same as the previous month. The resulting single index number is then seasonally adjusted to control for the effects of repetitive intra-year variations (resulting primarily from normal differences in weather conditions, various institutional arrangements, and differences attributable to nonmoveable holidays). The seasonal adjustment factors are supplied by the U.S. Department of Commerce and are subject annually to relatively minor changes when conditions warrant.

The composite PMI uses these weights: New Orders 30 percent, Production 25 percent, Employment 20 percent, Deliveries 15 percent, and Inventories 10 percent.

SOURCE AGENCY

National Association of Purchasing Managers (NAPM). The data begin in 1948.

BCI-62 (A0M062)
Source – TCB, FRB, BEA

Index of Labor Cost per Unit of Output, Manufacturing

Index (1992=100), SA

This index series measures the relationship between labor costs in the manufacturing sector and associated production (in value-added terms). It is used to track labor costs on a per unit basis for the manufacturing sector and both one- and six-month percent changes are available in the BCI database. The latter series, change in index of labor cost per unit of output, manufacturing (A6M062), is a component of the lagging index.

TECHNICAL NOTES

The index is constructed by The Conference Board from various components, including seasonally adjusted data on employee compensation in manufacturing (wages and salaries plus supplements) from the BEA, and seasonally adjusted data on industrial production in manufacturing from the Board of Governors of the Federal Reserve System. The formula used to calculate BCI-62 divides wages and supplements by industrial production and indexes the result to a base year of 1992=100.

Sources and Acknowledgments

The data descriptions in this section are based primarily on material originally published in the *Handbook of Cyclical Indicators*, 1984 (U.S. Department of Commerce, Bureau of Economic Analysis).

Updating help was provided by:
Ms. Lynn Franco and Mr. Ken Goldstein (The Conference Board, New York, NY)
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Mr. Neil DiBernardo (Dun & Bradstreet, Murray Hill, NJ)
Mr. Elliott Shurgin (Standard & Poor's, New York, NY)
Various Representatives (National Associations of Purchasing Managers, Tempe, AZ)

Further information can also be obtained from these Web sites:

The Conference Board's Consumer Research Center: www.crc-conquest.org
University of Michigan Survey of Consumers: athena.sca.isr.umich.edu/scripts/contents.asp
Dun & Bradstreet: www.dnbcorp.com
National Association of Purchasing Managers: www.napm.org

International Data:

A. International Transactions–Merchandise Trade Data

BCI-602 (A0M602) **Exports, Excluding Military Aid Shipments**
BCI-604 (U0M604) **Exports of Domestic Agricultural Products, NSA**
BCI-606 (U0M606) **Exports of Nonelectrical Machinery, NSA**
BCI-612 (A0M612) **General Imports**
BCI-614 (U0M614) **Imports of Petroleum and Petroleum Products, NSA**
BCI-616 (U0M616) **Imports of Automobiles and Parts, NSA**
Source – Census Millions ($), SA (unless noted NSA)

OVERVIEW

These series measure the dollar value of domestic and foreign merchandise shipped between the U.S. customs area and foreign countries, without regard to method of financing or whether exportation takes place in connection with a commercial transaction. The U.S. customs area includes the 50 states, the District of Columbia, Puerto Rico and, beginning in 1974, the U.S. Virgin Islands.

Domestic merchandise exports include commodities that are grown, produced, or manufactured in the United States, and foreign merchandise imported into the United States and subsequently exported after undergoing some change in form or enhancement in value as a result of further manufacture in the United States. Foreign merchandise exports include merchandise imported into the United States and subsequently exported in the same condition as when imported.

TECHNICAL NOTES

The data are compiled primarily from copies of Shippers' Export Declaration, and import entry and warehouse withdrawal forms filed with U.S. Customs officials.

The value reported in the export statistics generally is equivalent to the free-alongside-ship (f.a.s.) value at the U.S. port of exportation. It is based on the transaction price, including inland freight, insurance, and other charges, incurred in placing the merchandise alongside the carrier at the U.S. port of exportation.

Shipments for economic assistance under the Foreign Assistance Act and shipments under P.L. 480 (the Agricultural Trade Development and Assistance Act of 1954, as amended) and related laws are included.

U.S. Department of Defense Military Assistance Program Grant-Aid shipments are excluded. U.S. exports also exclude U.S. Department of Defense shipments designated for use by the U.S. Armed Forces; shipments to U.S. diplomatic missions abroad for their own use; shipments between the United States and Puerto Rico, between the United States and its possessions or between these possessions; exports from U.S. possessions to foreign countries; in-transit shipments through the United States (documented with Customs) that are going from one foreign country to another; bunker fuel, supplies, and equipment for vessels and planes engaged in foreign trade; and some types of relatively small shipments, such as personal and household effects of U.S. travelers and goods for the personal use of U.S. government employees abroad. Beginning January 1978, exports of nonmonetary gold in the form of ore, scrap, and base bullion and nonmonetary refined bullion are included.

General imports include merchandise released from customs custody immediately upon arrival, and merchandise entered into bonded storage warehouses, bonded manufacturing warehouses, and bonded smelting and refining warehouses immediately upon arrival.

Through December 1973, imports were valued as appraised by the U.S. Customs Service in accordance with the legal requirements of Sections 402 and 402A of the Tariff Act of 1930, as amended. The appraisal might be based on the foreign market value, export value, constructed value, or U.S. selling price. It generally represented a value in the foreign country and, therefore, excluded U.S. import duties, freight, insurance, and other charges incurred in bringing the merchandise to the United States. This valuation was primarily used for collection of import duties and

frequently did not reflect the actual transaction value. Effective January 1974, imports are valued at the customs value that represents the price actually paid or payable for merchandise when sold for exportation to the United States. The value is based on the purchase price, and generally includes all charges incurred in placing the merchandise alongside the carrier at the port of exportation in the country of exportation.

Prior to 1978, the date of entry (DOE) – the date the Customs officials accepted the import entry documents – was used to determine the month in which the imports were included in the statistics. Effective January 1978, the date of importation (DOI) – the date the merchandise actually entered the country – reported on the import entry documents is used to determine the month in which the imports are included in the statistics.

U.S. imports exclude U.S. goods returned by the United States Armed Forces; shipments into U.S. possessions; shipments between the United States and Puerto Rico, between the United States and its possessions, or between those possessions; imports of U.S. possessions; in-transit shipments from one foreign country to another through the United States when documented with customs; temporary shipments; and relatively small shipments, such as personal and household effects of travelers, low-valued nondutiable imports by mail, and issued monetary coins of all component metals. Beginning January 1978, imports of nonmonetary gold in the form of ore, scrap, and base bullion, and nonmonetary refined bullion are included.

Seasonal adjustments are made to BCI-602 and BCI-612 by the U.S. Census Bureau. The U.S. Census Bureau does not report seasonally adjusted versions of BCI-604, BCI-606, BCI-614 and BCI-616.

SOURCE AGENCY

U.S. Census Bureau. BCI-602 and BCI-612 begin in 1948; BCI-604, BCI-606, and BCI 614 begin in 1965; and BCI-616 begins in 1978. All six series are updated in Census report FT900.

B. International Comparisons–Industrial Production

OVERVIEW

The international industrial production indexes measure real output of the industrial sector (manufacturing, mining, and utility) of the world's most developed economies. Generally, the indexes are in value-added terms and are comparable to U.S. industrial production. There are slight differences in measurement, coverage, and construction across countries, however. For information on the precise methodology used in calculating the industrial production indexes for each country, contact the national source agencies.

TECHNICAL NOTES

The Conference Board has converted each international industrial production index in the BCI database to a base of 1990=100 in order to facilitate comparison.

SOURCE AGENCY

The Federal Reserve Bank (FRB) provides the U.S. industrial production indexes (BCI-720). The Organization for Economic Cooperation and Development (OECD) is the source agency for the industrial production index of the European member countries (BCI-721). All other international industrial production indexes are reported by the International Trade Administration (ITA), Office of Trade and Economic Analysis, which gathers data from each country.

BCI-720 (A0M720)
Source – FRB, TCB

United States, Industrial Production

Index (1990=100), SA

This series measures U.S. industrial production (manufacturing, mining, and utilities) in value-added terms and is expressed as a percentage of the estimated value in the base year 1990. (Additional details about this index are described earlier.

BCI-721 (A0M721)
Source – OECD, TCB

OECD Countries, Industrial Production

Index (1990=100), SA

This index combines industrial production indexes computed by national statistical agencies to form a total output measure for the majority of the European members of the OECD. Austria, Belgium, Luxembourg, Finland, France, Germany, Greece, Ireland, Italy, The Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom are included.

BCI-722 (A0M722) **United Kingdom, Industrial Production**
BCI-723 (A0M723) **Canada, Industrial Production**
BCI-723 (A0M723) **Germany, Industrial Production**
BCI-726 (A0M726) **France, Industrial Production**
BCI-727 (A0M727) **Italy, Industrial Production**
BCI-728 (A0M728) **Japan, Industrial Production**
Source – ITA, TCB
Index (1990=100), SA

C. International Comparisons–Consumer Price Indexes

OVERVIEW

The International Consumer Price Indexes measure changes in the costs of a fixed-market basket of goods and services that are considered representative of the consumption patterns for each particular country. They are designed to capture "pure" price changes – i.e., price changes not influenced by changes in quality and quantity – and move with general price inflation. For information on the precise methodology used in calculating the Consumer Price Indexes for each country, contact the national source agencies.

TECHNICAL NOTES

The Conference Board has converted each international industrial production index in the BCI database to a base of 1990=100 in order to facilitate comparison.

Note that the six-month percent changes in all these series are available in the *Business Cycle Indicator* publication as P6M732-P6M738.

SOURCE AGENCY

The Bureau of Labor Statistics provides the U.S. Consumer Price Index (BCI-730). All other international consumer price indexes are from the International Trade Administration (ITA), Office of Trade and Economic Analysis, which gathers data from each country.

BCI-730 (U0M730)
Source – BLS, TCB

United States, Consumer Price Index

Index (1990=100), NSA

This price index is based on a survey of prices paid by U.S. urban consumers for a representative market basket of goods and services. It is expressed as a percentage of average prices in the base year 1990. (Additional details about this index are described earlier).

BCI-732 (U0M732)
BCI-733 (U0M733)
BCI-735 (U0M735)
BCI-736 (U0M736)
BCI-737 (U0M737)
BCI-738 (U0M738)
Source – ITA, TCB

United Kingdom, Consumer Price Index
Canada, Consumer Price Index
Germany, Consumer Price Index
France, Consumer Price Index
Italy, Consumer Price Index
Japan, Consumer Price Index

Index (1990=100), NSA

D. International Comparisons–Stock Prices

OVERVIEW

The stock price indexes are designed to approximate the average movement of stock prices on a leading exchange of an individual country. Each stock included in the index represents a viable enterprise and is representative of the industry group to which it is assigned.

TECHNICAL NOTES

The base year and method of computation vary among the different countries. The Conference Board has converted each stock price index in the BCI data base to a base of 1990=100 in order to facilitate comparison.

SOURCE AGENCY

The stock price indexes are obtained directly from the national stock exchanges listed for each country.

BCI-740 (U0M740)
United States, Stock Prices
Standard & Poor's 500; TCB Index (1990=100), NSA

BCI-742 (U0M742)
United Kingdom, Stock Prices
Financial Times Stock Exchange; TCB Index (1990=100), NSA

BCI-743 (U0M743)
Canada, Stock Prices
Toronto Composite Index; TCB Index (1990=100), NSA

BCI-745 (U0M745)
Germany, Stock Prices
Deutsche Aktien (DAX); TCB Index (1990=100), NSA

BCI-746 (U0M746)
France, Stock Prices
Paris CAC; TCB Index (1990=100), NSA

BCI-747 (U0M747)
Italy, Stock Prices
Milan Composite Index; TCB Index (1990=100), NSA

BCI-748 (U0M748)
Japan, Stock Prices
Nikkei 225 Stock Average; TCB Index (1990=100), NSA

E. International Comparisons–Exchange Rates

OVERVIEW

The exchange rate series are the monthly average of the exchange value of the associated country's currency to the U.S. dollar.

TECHNICAL NOTES

All exchange rate series in the BCI are based on the noon buying rates in New York for cable transfers payable in foreign currencies, certified by the Federal Reserve Bank of New York for customs purposes. These exchange rate data are reported by the Federal Reserve System and published in *Foreign Exchange Rates* (G.5), a monthly Federal Reserve statistical release, and *Foreign Exchange Rates* (G.5A), an annual Federal Reserve statistical release.

The exchange rates for Germany, France and Italy were discontinued in January 1999, with the creation of the euro. The euro is the basic monetary unit for the 11 member states of the European monetary Union, consisting of Finland, France, Germany, Ireland, Italy, Luxembourg, the Netherlands, Portugal, and Spain.

The trade-based weights for BCI-750 are revised on an annual basis by the Federal Reserve Bank of New York. For details about the construction of BCI-750, including a description of how the weights are calculated and used, see "New Summary Measures of the Foreign Exchange Value of the Dollar" *Federal Reserve Bulletin*, October 1998 and "The Arrival of Chain Trade-Weighted Exchange Rate Indexes" *Business Cycle Indicators* (The Conference Board), January 1999.

The prior version of BCI-750 was based on a weighted average of the exchange value of the U.S. dollar against currencies of the other G-10 countries, plus Switzerland. Each country was weighted by its 1972-76 global trade. (Details published in the *Federal Reserve Bulletin*, August 1978.)

SOURCE AGENCY

Federal Reserve Bank of New York and the Board of Governors of the Federal Reserve System.

BCI-750 (U0M750)
Source – FRB

Exchange Value of U.S. Dollar

Index (March 1973=100), NSA

The exchange value of the U.S. dollar is an index based on a weighted average of the foreign exchange values of the U.S. dollar against a subset of other major international currencies. The index includes the currencies of Australia, Canada, Japan, Sweden, Switzerland, the United Kingdom, and the 11 countries that adopted the euro in January 1999.

The weighting scheme used in the construction of the indexes is based on a measure of relative trade competitiveness. In this measure, the importance of changes in the exchange value of a given foreign currency depends on the share of the country's goods in all markets that are important to U.S. producers. These weights are revised on an annual basis.

BCI-751 (U0M751)
Source – FRB

European Monetary Union, Exchange Rate

Euros per U.S. Dollar

BCI-752 (U0M752)
Source – FRB

United Kingdom, Exchange Rate

British Pound per U.S. Dollar

BCI-753 (U0M753)
Source – FRB

Canada, Exchange Rate

Canadian Dollar per U.S. Dollar

BCI-755 (U0M755)
Source – FRB

Germany, Exchange Rate*

German Deutschmark per U.S. Dollar

BCI-756 (U0M756)
Source – FRB

France, Exchange Rate*

French Franc per U.S. Dollar

BCI-757 (U0M757)
Source – FRB

Italy, Exchange Rate*

Italian Lira per U.S. Dollar

BCI-758 (U0M758)
Source – FRB

Japan, Exchange Rate

Japanese Yen per U.S. Dollar

* Replaced by the euro in January 1999.

Sources and Acknowledgments

The data descriptions in this section are based primarily on material originally published in the *Handbook of Cyclical Indicators*, 1984 (U.S. Department of Commerce, Bureau of Economic Analysis) and *Selected Interest Rates* (G13), a monthly Federal Reserve statistical release.

Help in compiling the data descriptions in this section was provided by various employees at the International Trade Administration, Office of Trade and Economic Analysis, Board of Governors of the Federal Reserve System in Washington D.C., and the Census Bureau. Further information can be obtained at these Web sites:

Board of Govenors of the Federal Reserve System: www.frb.fed.gov
International Trade Administration: www.ita.doc.gov
Bureau of Labor Statistics: www.bls.gov
U.S. Census Bureau: www.census.gov

National Income and Product Accounts (NIPA)

A. Gross Domestic Product and Related Measures of Total Output

OVERVIEW

Gross Domestic Product (GDP) is the most widely used measure of the nation's production. This series measures the market value of the goods and services produced by the labor and property located in the United States. GDP became the featured measure of the National Income and Product Accounts (NIPA) in 1991, replacing the prior emphasis on Gross National Product (GNP).

GDP and its major components are seasonally adjusted and reported in both current and 1996 dollars. The seasonal adjustments control for changes that occur at about the same time and with similar magnitude each year, and the 1996 dollar version controls for inflation using a chain-weighted methodology designed to most accurately measure changes in real output. (See technical notes below and reference in the acknowledgment section for further detail.)

BCI-055 (A0Q055)
Source – BEA

Gross Domestic Product

Billions (chained 96$), SAAR

This series measures the total market value in constant dollars of "final" sales of goods and services plus inventory change (as produced by the labor and property located in the United States). Purchases by one producing unit from another of "intermediate" products are not included and depreciation charges and other allowances for business and institutional consumption of fixed capital goods are not deducted.

TECHNICAL NOTES

NIPA calculates GDP in two ways:

- As the sum of the following products: personal consumption expenditures, gross private domestic investment (including the change in business inventories), net exports of goods and services (exports minus imports), and government spending (both consumption expenditures and gross investment).
- As the sum of incomes and other charges: Incomes of labor and property are summed in the forms in which they accrue to residents before income tax deductions to national income. Other charges are included to arrive at the total market value of goods and services that are added to national income.

BEA reconciles differences in the two measures of GDP using a statistical discrepancy adjustment that emphasizes the product-based estimate, which is considered more reliable.

GDP in chained 1996 dollars (i.e., real GDP) is derived by dividing components of current-dollar GDP by appropriate price indexes in as fine a breakdown as possible and then aggregating these components using a Fisher quantity-index methodology. In deriving this index, detailed output components are weighted, specifically by prices in the current and preceding periods, to give the most accurate possible real growth rate. GDP in chained 1996 dollars in the current period is calculated by applying the index-derived growth rate to the (chained 1996) estimate for the previous period. (The change to a chain-weighted methodology occurred in January 1996. Previously, a "fixed-weight" method was used that simply added the price-deflated components to derive aggregate, constant-dollar GDP. See box on "BEA Measures of Output and Prices" for additional information.)

GDP is seasonally adjusted at the component level.

NIPA release schedules and revisions to GDP:

Although GDP and related NIPA data are quarterly based, they are published and revised monthly. New NIPA releases are generally available during the last week of the month, per the following schedule:

- The first month after the end of the quarter – the "advance" estimate is published based on incomplete information.
- The second month after the end of the quarter – the second "preliminary" estimate is published based on more complete information – and the first estimates of profits data for the quarter are made available.
- The third month after the end of the quarter – the third and "final" estimate for the preceding quarter is published, which is generally very close to the estimate in the preliminary release. (Although the release is termed final by BEA, the data are subject to revision in subsequent releases.)

GDP and related NIPA data for the last three years are typically revised each summer, and more comprehensive, benchmarking revisions are made roughly every three to five years. The last comprehensive revision occurred in October 1999. See the August 1999 issue of *Survey of Current Business* for more information.

Explanatory Note: BEA Measures of Output and Prices

The following, which describes the BEA's deflation methodology and the corresponding chain-type quantity and price indexes, is based on a note that accompanies each NIPA release, and provides users with information about the basic data series from which all of the BEA/NIPA tables and presentations of GDP are derived.

Changes in current-dollar GDP measure changes in the market value of goods, services, and structures produced in the economy in a particular period. For many purposes, it is necessary to decompose these changes into quantity and price components. Prices are expressed as index numbers with the base period at present, the year 1996=100. Quantities, or "real" measures, are expressed as index numbers with the base period (1996) equal to 100. The current-dollar values and price indexes for most GDP components are determined largely by using data from Federal government surveys. The real values (expressed with 1996 as the base period) of these components are calculated by deflation at the most detailed level for which all the required data are available by dividing the current-dollar value of the component by its price index, where the price index uses 1996 as the base period.

The annual changes in quantities and prices are calculated using a Fisher formula that incorporates weights from two adjacent years. (Similar formulas are used to calculate the quarterly indexes for the most recent quarters, called the "tail" period, and for the indexes for the other quarters, called the "historical" period.) For example, the 1996–1997 annual percent change in real GDP uses prices for 1996 and 1997 as weights, and the 1996–1997 annual percent change in price uses quantities for 1996 and 1997 as weights. These annual changes are "chained" (multiplied) together to form time series of quantity and price. Because the Fisher formula allows for the effects of changes in relative prices and in the composition of output over time, the resulting quantity or price changes are not affected by the substitution bias associated with changes in quantities and prices calculated using a fixed-weight formula. The Fisher formula also produces changes in quantities and prices that are not affected by the choice of base periods. In addition, because the changes in quantities and prices calculated in this way are symmetric, in general, the product of a quantity index and the corresponding price index equals the current-dollar index. (BEA also publishes a measure of the price level, known as the "implicit price deflator [IPD]," which is calculated as the ratio of current-dollar value to the corresponding chained-dollar value, multiplied by 100. The values of the IPD are very close to the values of the corresponding "chain-type" price index for all periods.)

Chain-type quantity and price indexes for GDP and its major components are presented in Table 5 of the NIPA releases and in the form of percentage changes from the preceding period in Tables 1, 4, 6A, and 6B. Contributions by major components to changes in real GDP are presented in Table 2. BEA also prepares measures of real GDP and its components in a dollar-denominated form, designated "chained (1996) dollar estimates." For GDP and most other series, these estimates, which are presented in Table 3, are computed by multiplying the 1996 current-dollar value by a corresponding quantity index number and then dividing by 100. For example, if a current-dollar GDP component equaled $100 in 1996 and if real output for this component increased 10 percent in 1997, then the chained (1996) dollar value of this component in 1997 would be $110 ($100 x 1.10).

For analyses of changes over time in an aggregate or in a component, the percentage changes calculated from the chained-dollar estimates and from the chain-type quantity indexes are the same; any differences will be small and due to rounding. However, because the relative prices used as weights for any period other than the base period differ from those used for the base period, the chained-dollar values for the detailed GDP components will not necessarily sum to the chained-dollar estimate of GDP or to any intermediate aggregate. A measure of the extent of such differences is provided by a "residual" line, which indicates the difference between GDP (or another major aggregate) and the sum of the most detailed components in the table. For periods close to the base year, when there usually has not been much change in the relative prices that are used as weights for the chain-type index, the residuals tend to be small, and the chained (1996) dollar estimates can be used to approximate the contributions to growth and to aggregate the detailed estimates. As one moves further from the base period, the residual tends to become larger, and the chained-dollar estimates become less useful for analyses of contributions to growth. In particular, for components for which relative prices are changing rapidly, these calculations may be misleading even just a few years from the base year. Therefore, Table 2 in the NIPA releases provides a more reliable derivation of contributions (using a better basis for determining the composition of GDP growth than the simple, chained-dollar estimates described above).

For further information, including detailed discussions of the effect of chain-weighted indexes, and the most accurate manner to calculate the contributions to GDP, see "A Guide to the NIPA's," ***Survey of Current Business****, March 1998, pp. 36-40, and "BEA's Chain Indexes, Time Series, and Measures of Long-Term Economic Growth,"* ***Survey of Current Business****, May 1997, pp. 58-68.*

SOURCE AGENCY

Bureau of Economic Analysis. Most NIPA series begin in 1959, some in 1946 and 1947. These data are found in various tables in the monthly *Survey of Current Business*.

BCI-50 (A0Q050)
Source – BEA

Gross National Product

Billions (chained 96$), SAAR

Gross national product (GNP) is the market value of the goods and services produced by labor and the property supplied by U.S. residents in the United States or in a foreign country. The main difference between GDP and GNP is where and who produces the goods, as GNP equals GDP plus net factor income from the rest of the world. Net factor income represents the receipts from goods and services produced abroad using labor and property supplied by U.S. residents minus payments of factor income to the rest of the world (which represents goods and services produced in the U.S. using the labor and property supplied by foreign residents). The items in factor income include interest, compensation of employees, and corporate profits. GNP in chained 1996 dollars is derived by the same methodology as described for GDP.

BCI-49 (A0Q049)
Source – BEA

Value of Domestic Goods

Billions (chained 96$), SAAR

This series is the sum of the final sales of goods plus the change in business inventories. Final sales measures that part of GDP that is sold to final users during the period. It includes sales to consumers, gross fixed investment, sales to government, and net sales to foreigners (exports less imports). Change in private inventories measures the value of the change in the physical volume of farm and nonfarm inventories held by business.

BCI-055 (A1Q055)
Source – BEA

GDP Implicit Price Deflator

Index (1996=100), SA

This series is a broad measure of prices and is calculated as the ratio of the current-dollar value of GDP to the corresponding chained 1996 value, and restated as an index that uses 1996 as the base year (i.e., multiplied by 100 since 1996 is the base year for constant-dollar GDP).

BCI-311 (A0Q311)
Source – BEA

Chain-Weighted Price Index, Gross Domestic Business Product

Index (1996=100), SA

This series measures the price level for all items included in the gross domestic business product, in index form, using a chain-weighted methodology.

B. Personal Consumption Expenditures

OVERVIEW

Personal Consumption Expenditures (PCE) is the largest component of GDP and, therefore, a very important component of aggregate demand. This NIPA category consists primarily of new goods and services purchased by individuals. PCE also includes purchases of new goods and services by nonprofit institutions that serve individuals (including compensation of employees), net purchases of used goods by individuals and nonprofit institutions, purchases abroad of goods and services by U.S. residents, and the value of food, fuel, clothing, rent of dwellings, and financial services received in kind by individuals.

TECHNICAL NOTES

The quarterly NIPA-based PCE series are defined in the same manner as the monthly PCE series (BCI-224 and BCI-225). See earlier section on personal consumption expenditures for details, including additional information on the chain-weighted deflation methodology, which is consistent with GDP in chained 1996 dollars.

The PCE data do not measure total domestic production of consumption goods and services, only expenditures. The former requires adjustments for changes in inventories, addition of exports, and subtraction of imports (which is why changes in inventories and net exports are separate components of GDP).

BCI-231 (A0Q231)
Source – BEA

Personal Consumption Expenditures

Billions (chained 96$), SAAR

This series measures all forms of personal consumption of goods and services purchased by persons resident in the United States. The three main PCE categories – durables, nondurables, and services – are described below.

BCI-233 (A0Q233)
Source – BEA

Personal Consumption Expenditures, Durables

Billions (chained 96$), SAAR

The durables portion of PCE covers all commodities that can be stored or inventoried (i.e., not services) with an average life of at least three years. The main subcategories for PCE Durables are: motor vehicles and parts; furniture and household equipment; and other.

BCI-238 (A0Q238)
Source – BEA

Personal Consumption Expenditures, Nondurables

Billions (chained 96$), SAAR

The nondurables portion of PCE covers all commodities that can be stored or inventoried (i.e., not services) with an average life of less than three years. The main subcategories for PCE Nondurables are food; clothing and shoes; gasoline and oil; fuel oil and coal; and other.

BCI-239 (A0Q239)
Source – BEA

Personal Consumption Expenditures, Services

Billions (chained 96$), SAAR

The services portion of PCE covers commodities that cannot be stored and that are consumed at the place and time of purchase. The main subcategories for PCE Services are housing; household operation (electricity and gas, other household operation); transportation; medical care; recreation; and other.

C. Gross Private Domestic Investment and Components

OVERVIEW

In the NIPA categories, gross private domestic investment covers all fixed capital goods purchased by private business and nonprofit institutions, and the value of the change in the physical volume of inventories held by private business. The capital goods portion has several major components including producers' durable equipment, nonresidential structures, and residential structures that often show large and somewhat diverse cyclical swings. Cyclical movements in private inventories are also studied closely, as they can reflect both intentional changes in production relative to sales, and unintentional changes in inventories (from sales exceeded or falling short of business expectations).

BCI-85 (A0Q085)
Source – BEA

Gross Private Domestic Investment

Billions (chained 96$), SAAR

Gross private domestic investment includes nonresidential fixed investment (BCI-86), residential fixed investment (BCI-89), and change in private inventories (BCI-30). These subcomponents are described in greater detail below.

BCI-86 (A0Q086)
Source – BEA

Nonresidential Fixed Investment

Billions (chained 96$), SAAR

This series measures the value of private domestic investment in nonresidential structures (BCI-87) and producers' durable equipment (BCI-88) that are purchased by private business and nonprofit institutions. This series excludes the change in business inventories.

BCI-87 (A0Q087)
Source – BEA

Nonresidential Fixed Investment, Structures

Billions (chained 96$), SAAR

This series, which measures investment in nonresidential or business structures, includes the purchases of new, privately owned nonresidential buildings, farm structures, public utilities, and other types of structures, including hotels, motels, and necessary service facilities (such as plumbing, heating, and elevators). This category of structures also covers certain types of permanent equipment such as blast furnaces and nuclear reactors, which are built primarily on site, as well as the exploration and development of oil and gas wells and mine shafts. BCI-87 also includes net purchases of used structures and brokers' commissions on the sale of structures. The main subcategories are nonresidential buildings (including farm); utilities; mining exploration, shafts, and wells; and other structures.

BCI-88 (A0Q088)
Source – BEA

Nonresidential Fixed Investment, Producers' Durable Equipment

Billions (chained 96$), SAAR

The producers' durable equipment (PDE) portion of private domestic investment includes purchases of new equipment and net purchases of used equipment with an expected economic life of one year or more (sales of equipment scrap other than autos are deducted) that are chargeable to fixed asset accounts, and for which depreciation accounts normally are maintained. The main subcategories for BCI-88 are information processing and related equipment; transportation and related equipment; and other.

BCI-89 (A0Q089)
Source – BEA

Residential Fixed Investment

Billions (chained 96$), SAAR

This series measures purchases of housekeeping and nonhousekeeping residential buildings (including necessary service facilities, such as plumbing, heating, and elevators) by businesses and individuals, and improvements to these buildings. (Nonhousekeeping residential buildings consist of dormitories and similar facilities.) BCI-89 is primarily a measure of the purchase value of new residential construction. It does not include the value of land sales, but does include net purchases of used residential structures and commissions on the sale of residential structures.

BCI-30 (A0Q030)
Source – BEA

Change in Private Inventories

Billions (chained 96$), SAAR

The change in private inventories series that is a component of GDP measures the change in the physical volume of goods purchased by business for use in the production of other commodities, or for resale. Included are nonfarm inventories, such as purchased materials, supplies, goods-in-process, finished goods, goods purchased for resale, and farm inventories (livestock and harvested crops). The inventories that determine BCI-30 are valued in average prices for the period.

D. Government Spending

OVERVIEW

The government spending series that is a component of GDP consists of both *Government Consumption Expenditures* and *Gross Investment* (BCI-560). The latter category covers net purchases of new and used structures and equipment by general government and government enterprises, and changes in inventories; all other transactions are consumption expenditures.

BCI-560 (A0Q560)
Source – BEA

Government Consumption Expenditures and Gross Investment

Billions (chained 96$), SAAR

This series consists of net purchases by Federal, state and local governments of goods and services; payments by general government to households in the form of compensation of employees; the consumption of general government fixed capital, which represents the value of the current services of fixed assets of general government; and government gross investment, which represents net purchases of new and used structures and equipment by general government and the inventory change of government enterprises. BCI-560 also includes a deduction for general government sales – primarily tuition payments for higher education and charges for medical care.

BCI-561 (A0Q561)
Source – BEA

Government Consumption Expenditures and Gross Investment, Federal Government

Billions (chained 96$), SAAR

This series measures net purchases of goods, services and structures from businesses and from the rest of the world by the Federal government, and other government expenditures such as Federal employee compensation. BCI-561 is the Federal government portion of BCI-560.

BCI-565 (A0Q565)
Source – BEA

Government Consumption Expenditures and Gross Investment, Federal Government, Military

Billions (chained 96$), SAAR

This series measures net purchases of goods, services and structures from businesses and from the rest of the world by the Federal government for military purposes. BCI-565 is the military portion of BCI-561.

BCI-562 (A0Q562)
Source – BEA

Government Consumption Expenditures and Gross Investment, State and Local Government

Billions (chained 96$), SAAR

This series measures net purchases of goods, services and structures from businesses and from the rest of the world by state and local governments, which includes expenditures on local public schools and all state and local government employee compensation. BCI-562 is the state and local portion of BCI-560.

BCI-564 (A0Q564)
Source – BEA

Federal Government Purchases, National Defense

Billions (chained 96$), SAAR

This series measures federal government consumption expenditures and gross investment for national defense. The following activities are classified as national defense: U.S. Department of Defense military functions; military assistance to other nations; U.S. Department of Energy atomic energy defense activities; and certain other defense-related activities. Large annual payments to civilian and military retirement funds by the Office of Personnel Management and the U.S. Department of Defense civil functions are also included.

E. Imports and Exports

OVERVIEW

The NIPA series for import and export spending include merchandise goods and services traded by the United States internationally. Exports are positive contributors to GDP, as they measure international sales of goods and services produced by labor and property located in the United States. Imports have the opposite effect on GDP, as they measure goods and services produced by labor and property located outside the United States that are included in other GDP spending categories (e.g., personal consumption expenditures and business investment). Therefore, GDP is positively related to net exports (exports less imports).

The NIPA export and import data are derived from the international balance of payments accounts. The data do not include factor income or transfer payments, and should not be confused with monthly trade data or quarterly international balance of payments data.

BCI-636 (A0Q636)
Source – BEA

Net Exports of Goods and Services

Billions (chained 96$), SAAR

Net exports are simply exports (BCI-632) less imports (BCI-634).

BCI-632 (A0Q632)
Source – BEA

Exports of Goods and Services

Billions (chained 96$), SAAR

This series measures goods and services sold outside the United States by U.S. businesses or individuals. The major export categories are foods, feeds, and beverages; industrial supplies and materials; capital goods, except automotive; automotive vehicles, engines, and parts; consumer goods, except automotive; other goods and services. Receipts of factor income and transfer payments from the rest of the world are not included.

BCI-634 (A0Q634)
Source – BEA

Imports of Goods and Services

Billions (chained 96$), SAAR

This series measures goods and services brought into the United States from a foreign source (and sold). The major import categories are foods, feeds, and beverages; industrial supplies and materials, except petroleum and products; capital goods, except automotive; automotive vehicles, engines, and parts; consumer goods, except automotive; and other goods and services.

F. Income

BCI-220 (A0Q220)
Source – BEA

National Income

Billions (chained 96$), SAAR

The NIPA national income is the sum of accrued factor incomes that originate from the production of goods and services produced by the labor and property supplied by U.S. residents (including labor and property located outside the United States). Included are compensation of employees (wages and supplements); proprietors' income with inventory valuation and capital consumption adjustments; rental income of persons with capital consumption adjustment; corporate profits with inventory valuation and capital consumption adjustments; and net interest. Therefore, BCI-220 measures the net factor cost (net of consumption of fixed capital) of goods and services produced. National income (BCI-220) and GDP (BCI-055) are closely related, with the difference being that the former excludes business transfer payments and indirect business tax and nontax liability, and subtracts an estimate for consumption of fixed capital, and the latter excludes net receipts of factor income from the rest of the world.

BCI-221 (A0Q221)
Source – BEA

Personal Income

Billions (chained 96$), SAAR

This series is the NIPA quarterly version of the monthly personal income series (BCI-223). Included in BCI-221 are wage and salary disbursements; other labor income, proprietors' income with inventory valuation and capital consumption adjustments; rental income of persons with capital consumption adjustment; personal dividend income; personal interest income; transfer payments to persons; and a subtraction for personal contributions for social insurance. Personal income is also equal to national income (BCI-220) less corporate profits with inventory valuation and capital consumption adjustments; less net interest; less contributions for social insurance, and less WALD (wage accruals less disbursements); plus personal interest income; plus personal dividend income; plus government transfer payments to persons; and plus business transfer payments to persons.

BCI-222 (A0Q222)
Source – BEA

Disposable Income

Billions (chained 96$), SAAR

This series is equal to personal income (BCI-221) less personal tax and nontax payments. Subtracting personal outlays from disposable personal income yields personal saving (BCI-292).

G. Government Receipts and Expenditures

BCI-521 (A0Q521)
Source – BEA

Government Receipts

Billions ($), SAAR

This series is the sum of almost all government revenue sources and covers Federal, state, and local taxes, and other payments to government agencies that are treated like taxes. It includes personal income taxes, corporate profit taxes, capital gains taxes, social security contributions, local real estate taxes, nontax receipts from persons and businesses, and other (indirect) business taxes.

TECHNICAL

The major categories in government receipts are:

- Personal tax and nontax receipts includes payments by persons (may not be chargeable to a business expense) and certain other personal payments to government agencies are treated like taxes. Personal taxes include taxes on income, including realized net capital gains; on transfers of estates and gifts; and on personal property. Nontaxes include tuitions and fees paid to schools and hospitals operated by the government; fees, fines and forfeitures; and donations. Personal contributions for social insurance are not included.
- Corporate profits tax accruals is the sum of Federal, state and local income taxes on all corporate earnings including realized net capital gains. These taxes are net of refunds and applicable tax credits.
- Indirect business tax and nontax accruals are tax liabilities that are chargeable to business expense in the calculation of profit-type incomes and certain other business liabilities to government agencies (except government enterprises) that are treated like taxes.
- Contributions for social insurance are both employer and personal contributions to the social security insurance fund.

BCI-522 (A0Q522)
Source – BEA

Government Expenditures

Billions ($), SAAR

Total government expenditures is the sum of government purchase of goods and services (the consumption expenditures portion of BCI-560), government transfers such as social security payments and unemployment insurance, net interest paid on government securities, net subsidies (subtracting any current surpluses of government enterprises) less dividends received by government, and less government wage accruals less disbursements.

BCI-502 (A0Q502)
Source – BEA

Federal Government Expenditures

Billions ($), SAAR

This series is the Federal government portion of BCI-522.

TECHNICAL NOTES

The major categories in government expenditures are:

- Government purchases of goods and services include purchases from business (including net purchases of used goods), compensation of government employees, and purchases from foreigners. Transactions in financial assets and land are not included (as either purchases or expenditures).
- Transfer payments include income payments to persons for which they do not render current services. Included are benefits from social insurance funds and payments from certain other government programs. Transfers to foreigners (rest of the world) include U.S. government nonmilitary grants to foreign governments in cash and in kind and U.S. government transfer payments, mainly retirement benefits to former residents of the United States.
- Net interest paid is interest paid on the public debt less interest received from investments.
- Subsidies less current surplus of government enterprises include the monetary grants paid by government to business, including government enterprises at another level of government. Subsidies and current surplus are shown as a combined entry because deficits incurred by government enterprises may result from selling foods to business at below market prices in lieu of giving them subsidies.

The following items are subtracted from government expenditures:

- Dividends received include those dividends received by state and local general government, primarily by their social insurance funds.
- Wage accruals less disbursements are wages and salaries earned less wages and salaries paid. This difference occurs when there are retroactive changes.
- Transactions in financial assets and land (as either purchases or expenditures).

BCI-513 (AOQ513)
Source – BEA

Federal Grants-in-Aid to State and Local Government

Billions ($), SAAR

These are net payments from the Federal government to state and local governments to help finance state and local government activities in areas such as public assistance, highway construction and education.

SOURCE AGENCY

Bureau of Economic Analysis. These series begin in 1959.

H. Saving (Personal, Business, and Government)

OVERVIEW

Saving is as hard to measure as it is important in both economic theory and national income accounting, However, the basic concept is straightforward: Saving is that part of income not spent (income less consumption). Also, saving and investment are directly related because of identities in the National Income Account definitions. Controversies over the classification of certain items as either personal or business income and consumption or investment cloud the saving picture. (See technical notes below for further information.) Nonetheless, the NIPA definitions of saving are useful for monitoring the ability of the economy to fund the investment needed to enhance the capital stock and grow output. But, because national saving is a simple, current-dollar flow concept, it is not equivalent to the change in the market value of the nation's capital stock (i.e., accounting for the economic appreciation or depreciation of existing capital). In addition, it is important to distinguish between gross and net saving: The former is closer to cash flow, the latter deducts an estimate of capital depreciation known as the capital consumption allowance.

TECHNICAL NOTES

The national accounting rules that require national output to equal national income also require total saving to equal total investment (after recognizing the role of net foreign investment and that small statistical discrepancies are tolerated). Therefore, much of the controversies over definitions and measures of saving are directly related to controversies over definitions and measures of investment.

One problem in measuring and analyzing saving is that households, business firms, and government agencies can and do use their cash-flow income to purchase durable or capital equipment type goods, but these purchases are not always treated equivalently. For example, household purchases of almost all durable goods items (such as major household appliances and automobiles) are counted as personal consumption when similar purchases by businesses are counted as investment. For businesses, most durable goods purchases are treated as capital expenditures and not deducted from income in computing business saving. Instead, a capital consumption allowance is imputed (estimated) to represent the economic depreciation that results from the capital good's use in production (which depends on the expected life of the different capital stock items and estimates of early scrappage). Home purchases by individuals are treated in a similar manner (i.e., differently from other durable goods purchases by individuals). A capital consumption type allowance for house services is an imputed item in personal consumption expenditures (such that home ownership and housing rentals are treated similarly).

In addition, separations between personal and business saving are hard to make and controversial because profit income from proprietorships and other forms of nonincorporated businesses are harder to measure and treated differently from corporate profits in the National Income Accounts. (See descriptions of the personal income series in Section 3, and the corporate profits series in this section, for further details.)

Prior to the 1996 changes in NIPA classes, all government spending was treated as a current expenditure and lowered national gross saving. With the 1996 changes, measures of gross government saving were first made available by BEA when government spending was separated into consumption expenditures and capital expenditures. The change reduces government current expenditures by government net investment (gross capital expenditures less an estimate for consumption of fixed capital). The net effect was to substantially increase government surplus by government net investment, and national gross saving by government gross investment. The BCI database originally misclassified all consumption of fixed capital (private business and government) as business saving. The introduction of a new series, BCI-299, corrects this error and the full history of all BCI savings series now reflects the changes in the 1996 NIPA classifications.

BCI-290 (A0Q290)
Source – BEA

Gross Saving

Billions ($), SAAR

This series is the total of gross private saving (personal, BCI-292; business, BCI-295) and gross government saving (BCI-299). Gross saving includes personal saving, undistributed corporate profits with inventory valuation and capital consumption adjustments, and business consumption of fixed capital. It also includes wage accruals less disbursement, government (Federal, state and local) surplus or deficit, government consumption of fixed capital, and net capital grants received by the United States.

BCI-291 (A0Q291)
Source – BEA

Net Saving

Billions ($), SAAR

This series is gross saving (BCI-290) less business consumption of fixed capital, government consumption of fixed capital, and net capital grants received by the United States. It is also equal to the sum of personal saving (BCI-292), net business saving (BCI-295 less business consumption of fixed capital), and government surplus or deficit (BCI-298). The concept of net saving reflects an adjustment to gross, cash-flow type saving using an estimate for the depreciation of the national capital stock.

BCI-292 (A0Q292)
Source – BEA

Personal Saving

Billions ($), SAAR

Personal saving is personal income less personal outlays and personal tax and nontax payments. It includes current saving of individuals, nonprofit institutions that primarily serve individuals, life insurance carriers, private noninsured welfare funds, and private trust funds.

TECHNICAL NOTES

Personal saving does not equal the change in the net worth of persons because it excludes both changes in asset prices (including financial items such as stocks and bonds and nonfinancial items such as private homes and other types of real estate) and the physical depreciation of assets. Personal saving does correspond, however, to the sum of the net acquisition of financial assets plus the change in physical assets, less the sum of net borrowing and of consumption of fixed capital. Net acquisition of financial assets includes cash and deposits, securities, and the change in the net equity of individuals in life insurance and in private noninsured pension funds.

- Personal outlays are the sum of personal consumption expenditures, interest paid to persons, and personal transfer payments to foreigners (net). The last item consists of personal remittances in cash and in kind sent abroad, less such remittances from abroad.

- Personal tax and nontax payments are tax payments (net of refunds) by persons residing in the United States that are not chargeable to business expense, and certain other personal payments to government agencies that are treated like taxes (except government enterprises). Personal taxes include income, estate and gift, and personal property taxes. Nontaxes include donations and fees, fines, and forfeitures. Personal contributions for social insurance are not included.

BCI-293 (A0Q293)
Source – BEA

Personal Saving Rate

Percent of Disposable Personal Income, SA

This series measures the portion of disposable personal income (DPI) that is saved. BCI-293 is computed by dividing personal saving (BCI-292) by disposable personal income, and is expressed as a percent.

BCI-295 (A0Q295)
Source – BEA

Gross Business Saving

Billions ($), SAAR

Gross business saving is defined as the sum of undistributed corporate profits with inventory valuation and capital consumption adjustments, and the consumption of fixed capital by businesses and wage accruals less disbursements.

BCI-298 (A0Q298)
Source – BEA

Government Surplus

Billions ($), SAAR

The government surplus (or deficit, when negative) is simply government receipts (BCI-521), less government expenditures (BCI-522). It may also be viewed as the sum of net acquisitions of financial assets by government and government enterprises, and net government purchases of land, and of rights to government-owned land, including oil resources, less net borrowing.

BCI-299 (A0Q299)
Source – BEA

Gross Government Saving

Billions ($), SAAR

This series is the sum of government surplus (BCI-298) and government consumption of fixed capital. The latter component is based on estimates of depreciation in government-owned capital assets (which decreases the official measure of government surplus, but is not a cash-flow type expense).

I. Corporate Profits

OVERVIEW

Corporate profits cover the earnings or income of corporations organized for profit and of mutual financial institutions that accrues to U.S. residents, measured before profits taxes, before deduction of depletion charges, and after exclusion of capital gains or losses, and net of dividends received from domestic corporations. In addition to profits earned in domestic operations, corporate profits include net inflows of dividends from abroad, reinvested earnings of incorporated foreign affiliates, and earnings of unincorporated foreign affiliates.

In major respects, profits are defined as in Federal income tax regulations, but adjustments must be made in the National Income and Product Accounts (NIPAs) to be consistent with other items in national income and GDP. Corporate profits with inventory valuation and capital consumption adjustments (BCI-79) is generally the second largest item in National Income (BCI-220), after compensation of employees.

TECHNICAL NOTES

The "corporate" category for NIPA purposes includes all entities required to file Federal corporate tax returns, including mutual financial institutions and cooperatives subject to Federal income tax; private noninsured pension funds; nonprofit institutions that primarily serve business; Federal Reserve banks; and federally sponsored credit agencies.

There are several BCI series for corporate profits. All are based on profits before tax that measures corporate receipts less expenses (including interest payments) as defined in Federal tax law, with these differences: receipts exclude capital gains and dividends received, expenses exclude depletion and capital losses and losses resulting from bad debts. Income earned abroad by U.S. corporations is included and income earned in the United States by the rest of the world is excluded. Differences in the profit series are primarily due to these items:

- Profits tax liability is the sum of Federal, state, and local corporate income taxes. Income subject to tax can include capital gains and other items excluded from profits before tax.
- Inventory valuation adjustment (IVA) is the difference between the cost of inventory withdrawals as valued (in the source data) to determine profits before tax, and the cost of withdrawals valued at replacement cost. IVA adjusts inventories from historical cost - the valuation concept generally underlying business accounting - to inventories at replacement cost - the concept underlying the NIPAs.
- Capital consumption adjustment (CCAdj) is tax return-based capital consumption allowances less capital consumption allowances that are based on estimates of uniform service lives, straight-line depreciation, and replacement cost.

Undistributed corporate profits are the portion of profits remaining after taxes and dividends have been paid.

IVA is used in the NIPAs because the inventories in the source data are often charged to "cost of sales" (i.e., withdrawn) at their acquisition (historical) cost rather than at their replacement cost (the concept underlying the NIPAs). As prices change, companies that value inventory withdrawals at acquisition cost may realize inventory profits or losses. In the NIPAs, inventory profits or losses (IVA with the sign reversed) are shown as adjustments to business income (corporate profits and nonfarm proprietors' income). No adjustment is needed to farm proprietors' income because farm inventories are measured on a current-market-cost basis.

In the NIPAs, another adjustment is made that represents the difference between accounting-based depreciation allowances and better measures of economic depreciation. The latter is estimated based on various data sources, including studies of prices of used equipment and structures in resale markets. CCAdj is the difference between the capital consumption allowance (CCA), which consists of tax-return-based depreciation charges for corporations and nonfarm proprietorships, and the estimated capital consumption measures.

SOURCE AGENCY

Bureau of Economic Analysis. BCI-16, BCI-22, and BCI-81 series begin in 1946. BCI-18 and BCI-35 series begin in 1959.

BCI-16 (A0Q016)
Source – BEA

Corporate Profits After Tax

Billions ($), SAAR

This series measures profits before tax less the sum of federal, state, and local income taxes. It consists of dividends and undistributed corporate profits.

BCI-18 (A0Q018)
Source – BEA

Corporate Profits After Tax, Constant Dollars

Billions, (chained 96$), SAAR

This series is the inflation-adjusted version of corporate profits after tax (BCI-16). To compute BCI-18, BEA deflates the dividend component of BCI-16 by a price index derived from current- and constant-dollar personal consumption expenditures. The undistributed profit component of BCI-16 is deflated by a price index derived from current- and constant-dollar nonresidential fixed investment. Both implicit price indexes are chain-weight based.

BCI-79 (A0Q079)
Source – BEA

Corporate Profits After Tax with IVA and CCAdj

Billions, SAAR

This series measures the net current-production income of organizations treated as corporations in the National Income and Product Accounts. This income is measured as receipts less expenses, using definitions in Federal tax law with these principal differences: capital gains and dividends received are excluded; and the effects of conventional inventory- and depreciation-accounting practices are adjusted to reflect replacement costs for inventory withdrawals and estimates of economic deprecation. (See technical notes for details.)

BCI-22 (A0Q022)
Source – BEA, TCB

Ratio, Corporate Domestic Profits After Tax to Corporate Domestic Income

Percent, SA

This series measures the relationship (ratio form) between corporate domestic profits after tax and corporate domestic income. Corporate domestic income includes compensation of employees, profits with IVA and CCAdj, and net interest. Both the numerator and denominator exclude income from operations outside of the United States.

BCI-81 (A0Q081)
Source – BEA, TCB

Ratio, Corporate Domestic Profits After Tax with IVA and CCAdj To Corporate Domestic Income

Percent, SA

This series measures the relationship (ratio form) between corporate domestic profits after tax with IVA and CCAdj and corporate domestic income. The only difference between this series and BCI-22 is that the latter does not include IVA and CCAdj.

BCI-35 (A0Q035)
Source – BEA

Corporate Net Cash Flow

Billions, (chained 96$), SAAR

The constant-dollar version of corporate net cash flow combines undistributed corporate profits, deflated by the implicit price deflator for nonresidential fixed investment, and corporate capital consumption allowances, deflated by the chain-weighted price index for range of capital stock items.

Additional Quarterly Series:

A. Employment Cost Indexes

(A0Q380) **Employment Cost Index, Total Compensation, Civilian Workers**
(A0Q381) **Employment Cost Index, Wages and Salaries, Civilian Workers**
(A0Q382) **Employment Cost Index, Benefit Costs, Civilian Workers**
Source – BLS
Index (June 1989=100), SA

OVERVIEW

The employment cost indexes (ECI) measure changes in wage and benefit compensation per hour worked, averaged over a broad spectrum of workers (including nearly all civilian, nonfarm employees). The indexes are constructed to be free from the effects of shifts among occupations and industries, but do not measure the total cost of employing labor (i.e., training, supervision, equipment, and other costs are not included).

BCI-380 includes wages and salaries, and employers' cost for employee benefits. BCI 381, which only measures wages and salaries, consists of earnings before payroll deductions, including production bonuses, incentive earnings commissions, and cost-of-living adjustments. BCI-382, the benefits portion, includes the cost to employers for paid leave, supplemental pay (including nonproduction bonuses), insurance, retirement and savings plans, and legally required benefits (such as Social Security, workers' compensation, and unemployment insurance).

TECHNICAL NOTES

Although the ECI do not cover all employers and employees, they cover nearly all workers in the civilian nonfarm economy. The ECI series are constructed as Laspeyres fixed-weight indexes that measure the cost of labor for a fixed set of labor inputs and, therefore, are free from the influence of employment shifts among occupations and industries. The compensation series shows changes in a given compensation package assuming constant usage, unless the benefit plan is changed.

Wages and salaries are defined as the hourly straight time wage rate or, for workers not paid on an hourly basis, straight time earnings divided by the corresponding hours. Straight-time wage and salary rates are total earnings before payroll deductions, excluding overtime and holiday pay, shift differentials, and nonproduction bonuses. However, production bonuses, incentive earnings, commission payments and cost-of-living adjustments are included.

Benefits covered are numerous. They include paid leave (overtime and shift differentials, and nonproduction bonuses); supplemental pay (for overtime and shift differentials, and nonproduction bonuses); insurance benefits; retirement and savings benefits, legally required benefits (Social Security, railroad retirement and supplemental retirement, Federal and state unemployment insurance, workers' compensation, and other legally required benefits); and benefits such as severance pay and supplemental unemployment plans.

Note that the ECI series differ from compensation per hour used in the BLS unit labor cost series (such as BCI-63, described in the following subsection).

SOURCE AGENCY

Bureau of Labor Statistics. These series begin in 1982.

B. Unit Labor Costs, Compensation per Hour, and Output per Hour

OVERVIEW

Unit labor costs, which measure the labor compensation cost required to produce one unit of output, have two main components: compensation per hour, which measures wages and salaries and supplemental payments (such as employer contributions for social insurance and to private pension and welfare funds) per hour worked; and output per hour, which measures the ratio of real output in a given sector to the corresponding hours worked by persons engaged in that sector. BLS unit labor costs are derived by dividing compensation per hour by real output per hour, and converting the resulting ratio to an index.

Compensation per hour includes wages and salaries (including shift differentials and overtime), payments in kind, commissions, supplements and employer contributions to employee benefits plans and taxes. The hours data include all hours for which an employee was in pay status, excluding paid leave. Hours of employees, proprietors, and unpaid family workers are included, and adjustments are made to reflect only for-profit activities.

The indexes of output per hour are computed by dividing an index of real output by the hours worked to produce that output; the result is converted to an index. Although these series relate output to the hours of all persons engaged in a sector, they do not measure the specific contribution of labor, capital, or any other factor of production. Rather, they reflect the joint effects of many influences, including changes in technology, capital investment, level of output, utilization of capacity, energy, and materials, the organization of production, managerial skill, and the characteristics and effort of the work force.

The BLS unit labor costs and output per hour series are principally derived from National Income and Product Account (NIPA) data, and employment surveys and are converted to indexes.

TECHNICAL NOTES

In intermediate calculations, indexes of real output in business and nonfarm business are derived from detailed information on real gross domestic product as compiled by the BEA. The hours or labor input series are derived from various BLS reports and surveys including the Current Employment Statistics (CES) and Current Population Survey (CPS) programs. (See the "Employment, Unemployment, and Other Labor Force Related Series" section of this Handbook for series that are based upon the same data.) NIPA data are also utilized in the estimates of hours.

Hours of employees in nonfarm establishments, derived primarily from CES data, are adjusted to reflect only for-profit activities. Because CES weekly hours are measured as hours paid rather than hours at work, the BLS "Hours at Work Survey" is used to convert the paid hours of nonfarm employees to an hours-at-work basis. Hours at work exclude all forms of paid leave, but include paid time to travel between job sites, coffee breaks, and machine down time. The CPS collects weekly hours on an at-work basis, so estimates of hours of farm workers, proprietors, unpaid family workers, and employees of government enterprises are only adjusted to account for those persons who are employed but not at work during a survey week.

In addition, the hours and compensation per hour data are adjusted to include the work time of proprietors and unpaid family workers and estimates of the value of the wage, salaries and supplements attributed to proprietors' hours.

Seasonal adjustments are typically made to the individual components of each series (to control for predictable seasonal variation).

SOURCE AGENCY

Bureau of Labor Statistics. These series began in 1947.

BCI-26 (A0Q026)
Source – TCB

Ratio, Price to Unit Labor Cost, Nonfarm Business Sector

Index (1992=100), SA

This series is based on the ratio of price to unit labor cost of output in the nonfarm business sector. The price series is an implicit price deflator derived by dividing the current-dollar estimate of nonfarm business sector gross domestic product by the corresponding real output estimate.

BCI-63 (A0Q063)
Source – BLS

Unit Labor Costs, All Persons, Business Sector

Index (1992=100), SA

Changes in this index correspond to changes in the cost of labor input required to produce one unit of output in the business sector.

BCI-345 (A0Q345)
Source – BLS

Average Hourly Compensation, Nonfarm Business Sector

Index (1992=100), SA

Changes in this index correspond to changes in average hourly compensation of employees in the nonfarm business sector, including government enterprises. BCI-345 is computed by BLS dividing compensation by labor input estimates (employee hours, as compiled by BLS). The resulting ratio is converted into an index. Compensation is the sum of wages and salaries, and supplements. The percent change in average hourly compensation, nonfarm business sector (P1Q345) is also included in the BCI.

BCI-346 (A0Q346)
Source – BLS

Real Average Hourly Compensation, Nonfarm Business Sector

Index (1992=100), SA

Changes in this index correspond to changes in the spending power of average hourly compensation of employees in the nonfarm business sector, including government enterprises. BCI-346 is essentially the inflation-adjusted version of BCI-345. BLS uses the Consumer Price Index for All Urban Consumers (CPI-U) as the price deflator. The percent change in real average hourly compensation, nonfarm business sector (P1Q346) is also included in the BCI.

BCI-358 (A0Q358)
Source – BLS

Output Per Hour, Nonfarm Business Sector

Index (1992=100), SA

Changes in this index correspond to changes in labor productivity in the nonfarm business sector. The methodology for BCI-358 is the same as BCI-370, but it excludes farms.

BCI-370 (A0Q370)
Source – BLS

Output Per Hour, Business Sector

Index (1992=100), SA

Changes in this index correspond to changes in labor productivity in the business sector. Labor productivity is based upon the ratio of output to labor input. (See technical notes in this section.)

BCI-110 (A0Q110)
Source – FRB

Funds Raised by Private Nonfinancial Borrowers

Millions ($), SAAR

This series measures the amount of funds raised (less debt repaid) each quarter in U.S. credit markets by households, state and local governments, nonfinancial businesses, and the rest of the world. Nonfinancial businesses consist of corporations, nonfarm noncorporate businesses (include partnerships and sole proprietorships), and farms. The forms of credit included are commercial paper, municipal securities and loans, corporate bonds, mortgages, consumer credit, bank and savings institution loans to business, bank loans to foreigners, U.S. government loans, GSE loans, finance company loans and asset-backed security issuer loans to business, foreign loans to nonfinancial corporate business, policy loans, and customer's liability on acceptances outstanding. Net new equity issues, security credit, trade payables, taxes payable, and other miscellaneous liabilities are excluded.

SOURCE AGENCY

Board of Governors of the Federal Reserve System. See *Flow of Funds*, a quarterly Federal Reserve statistical release. This series began in 1952.

Sources and Acknowledgments

The data descriptions in this section are based primarily on material originally published in the *Handbook of Cyclical Indicators*, 1984 (U.S. Department of Commerce, Bureau of Economic Analysis), *Employment and Earnings* (U.S. Department of Labor, Bureau of Labor Statistics), and the *BLS Handbook of Methods*, 1997 (U.S. Department of Labor, Bureau of Labor Statistics).

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Further information can also be obtained from these Web sites:

BEA home page: www.bea.doc.gov

BLS home page: www.bls.gov

BLS quarterly labor productivity home page: stats.bls.gov/lprhome.htm

FRB Home Page: www.bog.frb.fed.gov

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