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Cyclical Indicators for the United States

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1. The recent global financial crisis has highlighted the need for statistical agencies around the world to provide and feature up-to-date indicators that can help analysts identify potentially harmful trends in the economy. With the length and depth of the recent recession, many analysts in the U.S. and international communities have expressed concern that the necessary analytical indicators should have been available to warn policymakers that such a recession was imminent. Had they been available, these analysts have said, steps could have been taken earlier to help avert the financial crisis.
2. The U.S. national income and product accounts (NIPAs) did a good job of providing a timely and accurate general picture of the current state of economy, but the NIPAs did not perform as well in providing indicators of unsustainable trends in the economy. For example, more work was, and still is, needed by BEA to integrate its macro statistics with other major accounts, particularly with financial statistics.
3. To improve integration between the financial and production accounts for the U.S. economy, BEA began collaborating with the Federal Reserve Board (FRB). In 2006, the two agencies released the first annual statistics on a set of integrated macroeconomic accounts that related production, income and spending, capital formation, financial transactions, and asset revaluations to changes in net worth between balance sheets for the major sectors of the U.S. economy.¹ In 2010, the two agencies began releasing these statistics quarterly. In addition, BEA has expanded the presentation of saving and investment to show quarterly saving, investment, net lending, and net borrowing by sector to better align these estimates with the new quarterly integrated macroeconomic accounts. BEA has also begun releasing quarterly statistics on net investment by broad type of asset. Net investment, which had previously been available annually, is an important indicator that gauges the degree to which businesses are replacing their fixed assets.
4. In the United States, the Bureau of Economic Analysis (BEA) and other statistical organizations (including the Bureau of Labor Statistics, the Census Bureau, the Federal Reserve Board, and The Conference Board) produce a broad set of indicators that are used by U.S. policymakers in decision-making, by business and academic economists in building models of the economy, and by business and personal data users in making investments and in economic planning. Many of these economic indicators can be thought of as cyclical indicators.
5. This paper will present some of the major cyclical indicators for the U.S. economy. It will include a discussion of current and past indicators released by BEA as well as indicators released by other U.S. statistical organizations. Lastly, it will look at how well some of the major indicators performed during the recent 2008-2009 economic recession and suggest possible new statistics for assessing sustainability of trends in the economy.

¹ See Charlotte Anne Bond, Teran Martin, Susan Hume McIntosh, and Charles Ian Mead, "Integrated Macroeconomic Accounts for the United States," *Survey of Current Business* 87 (February 2007): 14-31.

Cyclical indicators

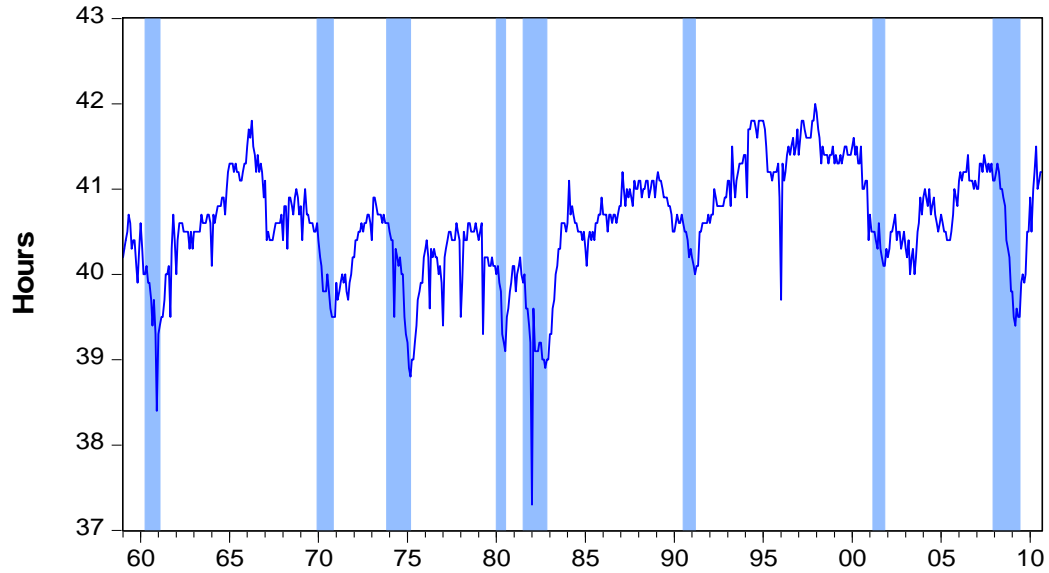
6. In the United States, a number of statistical organizations, including BEA, produce economic indicators that can function as cyclical indicators. In other words, the trends of these indicators tend to lead, coincide with, or lag behind broad movements in aggregate economic activity. The appendix to this paper provides three tables that list major cyclical indicators from BEA (table 1), other federal statistical agencies (table 2), and nonfederal statistical organizations (table 3).
7. Cyclical indicators have been used for many years as tools to understand the aggregate U.S. economy. The National Bureau of Economic Research (NBER) published the first formal list of cyclical indicators in 1938.² NBER then produced revised lists in 1950, 1961, and 1967. In 1975, in cooperation with NBER staff, BEA completed a comprehensive review of existing statistical indicators and began publishing cyclical indicators, including composite (leading, coincident, and lagging) indexes. In early 1996, the preparation and publication of cyclical indicators was transferred to The Conference Board.³ Today, The Conference Board maintains and publishes over 250 analytical indicators as part of its responsibility for producing and publishing the three composite cyclical indicators for the United States.⁴
8. The turning points of leading cyclical indicators tend to occur in advance of the aggregate economy. For example, the series “average weekly hours of manufacturing workers” is a cyclical indicator that generally leads the aggregate economy in business cycles. As shown in chart 1, over the last eight recessions (shown in blue from peaks to troughs), average weekly hours led the reference cycle peak seven times and was coincident with the peak one time. Average weekly hours led the reference cycle trough five times and was coincident with the trough three times.
9. Other examples of leading indicators include: 1) average weekly initial claims for unemployment insurance, 2) real manufacturers’ new orders of consumer goods and materials, 3) building permits for new private housing units, 4) real residential fixed investment, and 5) real money supply, M2.
10. The turning points of coincident indicators tend to coincide with turns in the aggregate economy. The most obvious example of a coincident indicator is real GDP. Chart 2 shows that the turning points of business cycles coincide closely with the turning points of real GDP.

² NBER is the U.S. organization responsible for formally identifying and dating cyclical peaks and troughs in the U.S. economy.

³ BEA transferred responsibility for maintaining the official U.S. business cyclical indicators program to The Conference Board in order to concentrate shrinking resources on core programs. The Conference Board began publishing these indicators in 1996.

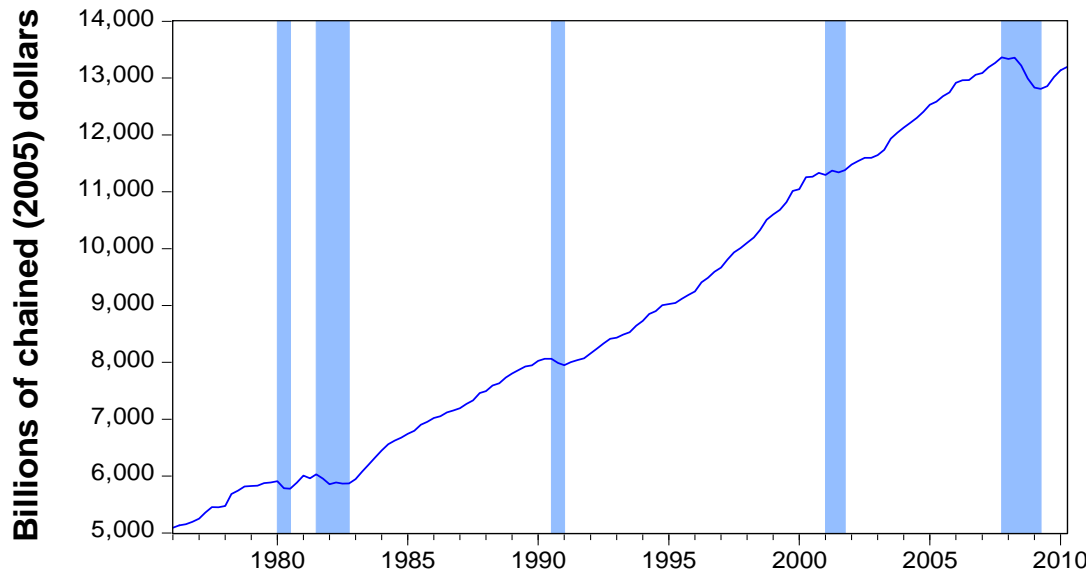
⁴ For additional information on the sources and methods used by The Conference Board, see The Conference Board, *Business Cycle Indicators Handbook* (New York: The Conference Board), January 2001.

Chart 1
Average Weekly Hours - Manufacturing



Source: Bureau of Labor Statistics

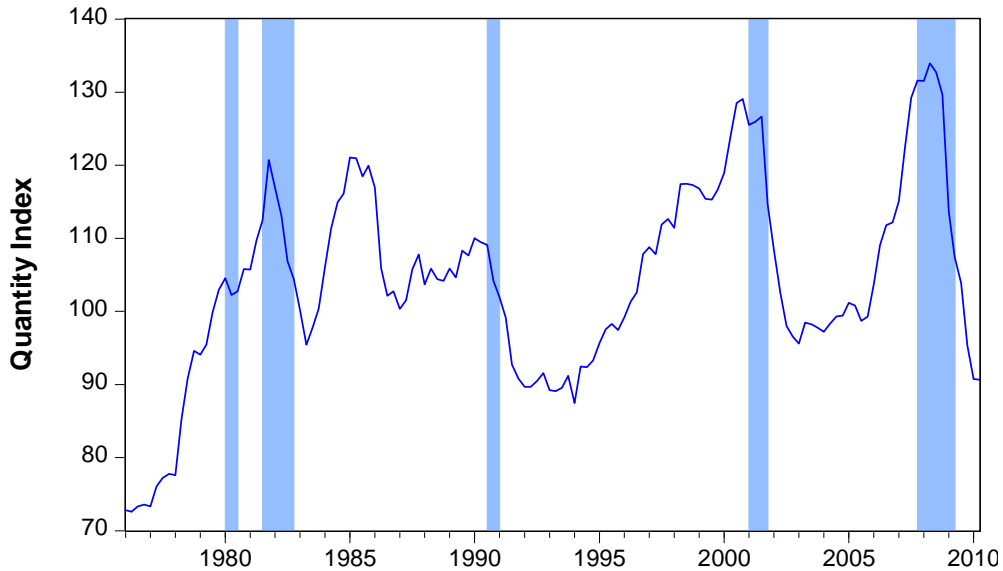
Chart 2
Real GDP



Source: Bureau of Economic Analysis

11. Other examples of coincident indicators include: 1) real personal income less transfer payments, 2) real manufacturing and trade sales, 3) the industrial production index, and 4) employees on nonagricultural payrolls.

Chart 3
Fixed Investment in Nonresidential Structures



Source:

Bureau of Economic Analysis

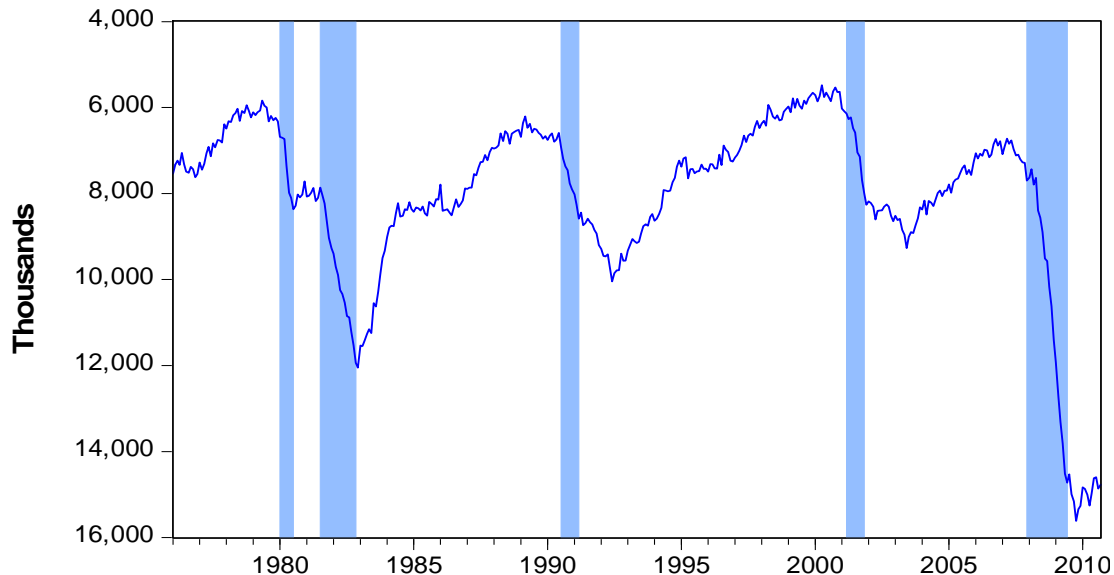
12. The turning points of lagging indicators tend to occur after the aggregate economy turns. Chart 3 shows that private fixed investment in nonresidential structures is a cyclical indicator that generally lags business cycle troughs.
13. Other examples of lagging indicators include: 1) the ratio of real manufacturing and trade inventories to real sales, 2) the average duration of unemployment (weeks), 3) the average prime rate charged by banks, 4) the ratio of consumer installment credit outstanding to personal income, and 5) the change in the consumer price index for services.
14. Some cyclical indicators behave differently for business cycle peaks than for troughs. Chart 4 shows that the number of persons unemployed leads the aggregate economy in changing direction at business cycle peaks while this indicator lags for troughs. Thus, for the overall economy, it is not classified.

Composite indicators

15. The Conference Board prepares composite indexes of leading, coincident, and lagging cyclical indicators that are summary measures designed to signal changes in the direction of the aggregate economy. Each index measures the average behavior of a group of economic time series that show similar timing at business cycle turns, but represent a cross section of activities or sectors of the economy. Because their coverage is diversified and includes minimal duplication, composite indexes tend to be more reliable as cyclical indicators than individual analytical indicators. Analyzing any one cyclical indicator may sometimes be misleading because that

series may occasionally experience volatility that is not directly related to the business cycle. Many of the measurement errors of the individual indicators and other “noise” in individual series are smoothed out in the composite index.

Chart 4
Number of Unemployed 16 Years and Older



Inverted scale

Source: Bureau of Labor Statistics

16. Over the past several decades, these composite indicators have been widely monitored but also subject to skepticism. As early as 1947, Koopmans criticized the use of composite indicators by the National Bureau of Economic Research as “measurement without theory” -- in other words, a reliance on trend analysis without a deeper understanding of underlying macroeconomic relationships.⁵ In a 1982 study of the predictive performance of BEA’s leading economic indicators, Auerbach revisited the controversies over measurement without theory, and found that BEA’s composite indicators offered both strengths and weaknesses.⁶

17. In their paper “Why the Composite Index of Leading Indicators Doesn’t Lead,” Evan Koenig and Kenneth Emery point to some of the pitfalls in relying too heavily on the composite leading index.⁷ They point out that unlike actual turning points for most recessions, the turning points for the composite leading indicator are usually not sharp. The index often declines more slowly in the early months of the downturn

⁵ See Tajalling C. Koopmans, “Measurement Without Theory,” *The Review of Economic and Statistics* Vol. 29, No. 3 (August 1947), pp. 161-172.

⁶ See Alan J. Auerbach, “The Index of Leading Indicators: “Measurement Without Theory,” Thirty-five Years Later,” *The Review of Economic and Statistics*, Vol. 64, No. 4 (November 1982), pp. 589-595.

⁷ See Evan F. Koenig and Kenneth M. Emery, “Why the Composite Index of Leading Indicators Doesn’t Lead,” Research Papers of the Research Department of the Federal Reserve Bank of Dallas No. 9318 (May 1993).

than in the later months making it difficult for analysts to recognize that the cyclical peak for the index has occurred until several months after the fact. Also, the underlying indicators that make up the index are subject to revision, which may sometimes significantly alter the performance of the index.

Performance during the most recent recession

18. How did the major indicators perform leading up to the latest recession? From the fourth quarter of 2007 until the second quarter of 2009, real GDP contracted 4.1 percentage points, the deepest contraction since the Great Depression. Except for a very mild contraction from the fourth quarter of 2000 to the third quarter of 2001, the United States had experienced relatively steady positive growth since 1991. So, the length and depth of this most recent U.S. recession was a surprise to many. Were the traditional indicators less useful than in the past?
19. Traditional leading indicators actually did point to signs of a coming recession. The composite leading indicators published by The Conference Board experienced significant growth from 2001 until December 2006 when it started to decline, one year before the December 2007 peak for the overall economy. Similarly, most of the indicator series that are used to compile this composite index began to turn before the business cycle peak.
20. Traditional leading indicators often indicate the direction of a business cycle, but not the magnitude. Each recession is different and the trigger point for each recession is often different. These indicators did point to signs of the coming recession that began in December 2007, but they did not provide analysts information regarding the severity of the upcoming recession or precise information regarding the beginning of the recession.
21. Given that the information provided by cyclical indicators is not always as precise as desirable, it might be better for countries to concentrate on improving their national accounts rather than trying to develop additional cyclical indicators.

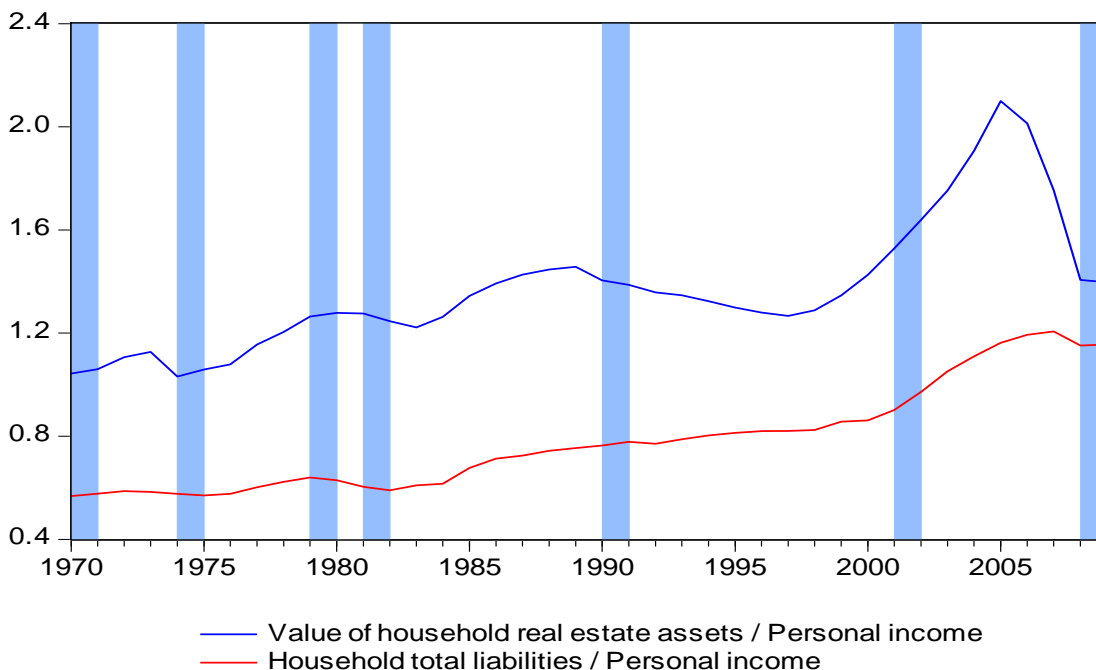
Possible new indicators for assessing sustainability of trends in the economy

22. New statistics could provide that understanding. Several statistical series are currently available. If given more prominence, they could provide further insights into possible imbalances developing in the housing and financial sectors as well as other areas of the economy. The *Survey of Current Business* article “GDP and Beyond, Measuring Economic Progress and Sustainability” discusses possible ways to combine current statistics to construct additional indicators to address sustainability.⁸ Highlighting new groupings of already existing cyclical indicators could potentially provide new tools to warn of impending downturns in the economy.

⁸ See J. Steven Landefeld, Brent R. Moulton, Joel D. Platt, and Shaunda M. Villones, “GDP and Beyond, Measuring Economic Progress and Sustainability,” *Survey of Current Business* 90 (April 2010): 12-25.

23. Grouping together and combining additional series can be helpful in analyzing the housing sector. The blue line in chart 5 shows the annual value of the U.S. housing stock relative to personal income over the period 1970 - 2009. Between 2000 and 2005, the value of the U.S. housing stock rose significantly relative to personal income, as housing prices rose considerably faster than personal income. While dropping a little in 2006 and somewhat more in 2007, the ratios were still very high compared with historical trends. The data suggest that the housing sector was experiencing an unsustainable bubble. The red line, although less dramatic, shows the ratio of household total liabilities to personal income. It points to households increasing willingness to accumulate substantial amounts of additional debt between 2000 and 2007. In addition, chart 6 shows that residential investment peaked in the fourth quarter of 2005, two years before the business cycle peak, and it declined sharply for 14 consecutive quarters. Collecting in one central location a series of housing indicators similar to those discussed above could have provided an early warning that the United States was experiencing a housing bubble.

Chart 5
Housing and Personal Income

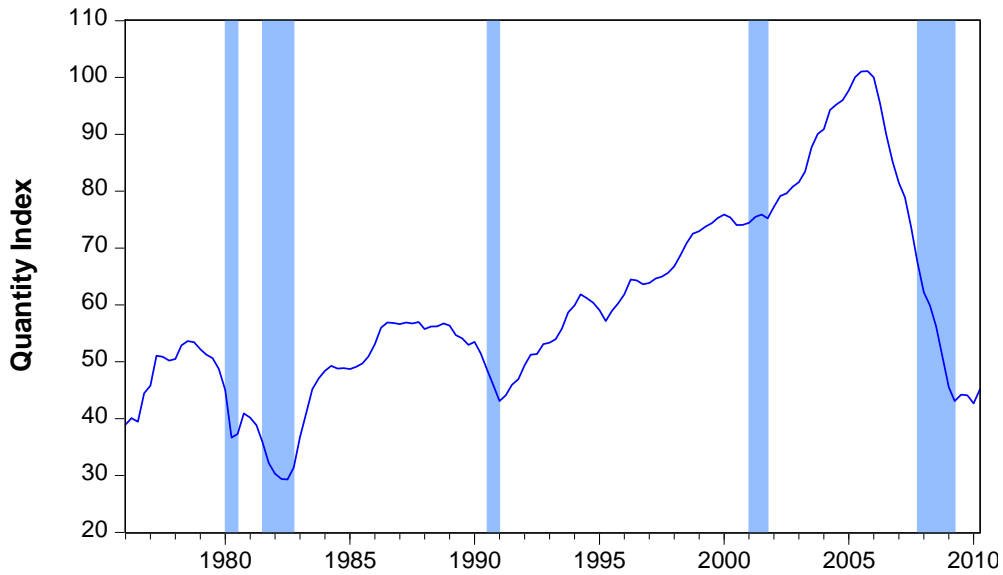


Source: BEA and the Federal Reserve Board flow of funds

24. Additional indicators might also be useful to evaluate conditions in the financial sector. Chart 7 compares the growth in the S&P 500 stock prices to after tax economic profits.⁹ The substantial growth in S&P prices leading up to the fourth quarter 2007 does not look sustainable when compared to after-tax profits, which began a steady decline after the third quarter of 2006.

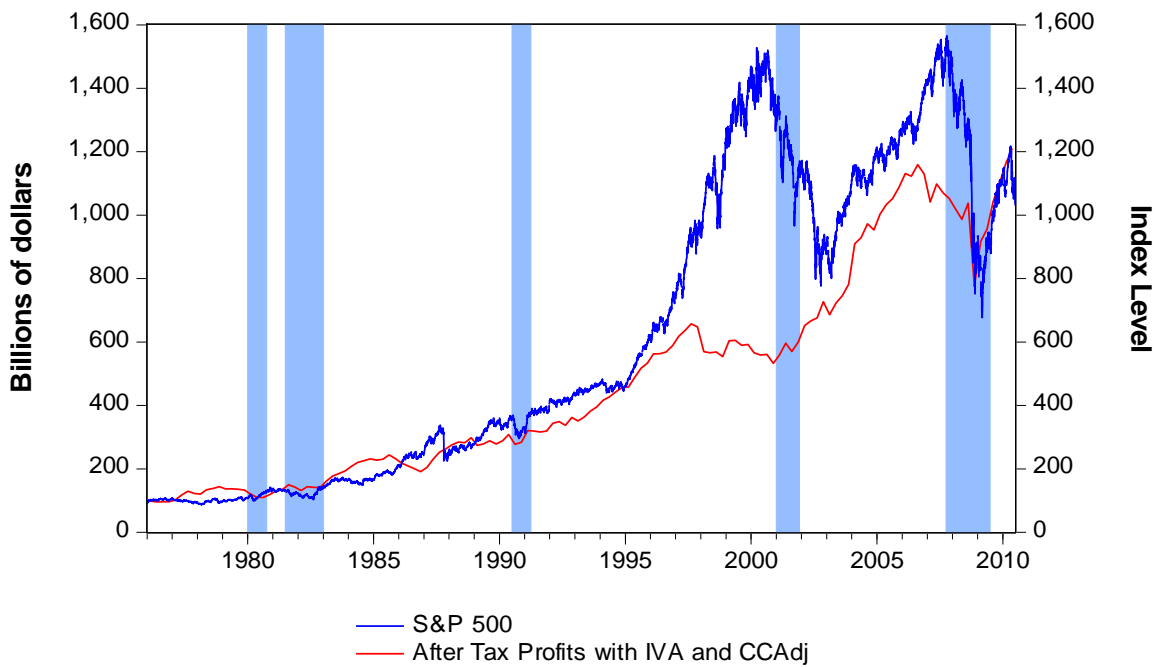
⁹ After-tax economic profits are prepared by BEA as part of its national economic accounts.

Chart 6
Residential Fixed Investment



Source: Bureau of Economic Analysis

Chart 7
S&P 500 vs. After Tax Profits



Source: Bureau of Economic Analysis and Standard & Poor's

25. In conclusion, the United States prepares some of the most useful and detailed analytical indicators in the world. The national economic accounts alone present over 400 quarterly or monthly analytical tables on GDP and related statistics. However, the evaluation of certain key subsectors of the economy could be improved if we prepared and disseminated additional measures of economic activity.

Appendix

Table 1

Major Business Cycle Indicators Prepared by the Bureau of Economic Analysis Inflation Adjusted Unless Otherwise Stated					
Indicator	Frequency	Business cycle behavior			Part of CF composite economic indexes
		Peak	Trough	Overall	
Personal income less transfer payments	M	C	C	C	Y
Manufacturing and trade sales	M	C	C	C	Y
Ratio, manufacturing and trade inventories to sales	M	Lg	Lg	Lg	Y
Gross domestic product	Q	C	C	C	
Private nonresidential fixed investment	Q	C	Lg	C	
Private fixed investment in nonresidential structures	Q	Lg	Lg	Lg	
Private fixed investment in equipment and software	Q	C	Lg	C	
Private residential fixed investment	Q	L	L	L	
Change in private inventories	Q	L	L	L	
Corporate profits after tax (current dollars)	Q	L	L	L	

Acronyms:

CF: Conference Board

M: Monthly

Q: Quarterly

L: Leading indicator

C: Coincident indicator

Lg: Lagging indicator

Y: Yes

Table 2

Major Business Cycle Indicators Prepared by Other U.S. Federal Statistical Agencies

Indicator	Agency	Frequency	Business cycle behavior			Part of CF composite economic indexes
			Peak	Trough	Overall	
Labor force:						
Average weekly hours, manufacturing	BLS	M	L	L	L	Y
Average weekly overtime hours, mfg.	BLS	M	L	C	L	
Average weekly initial claims for unemployment insurance	DOL	M	L	C	L	Y
Average duration of unemployment, weeks	BLS	M	Lg	Lg	Lg	Y
Employee hours in nonagricultural establishments	BLS	Q	U	C	C	
Employees on nonagricultural payrolls	BLS	M	C	C	C	Y
Number of persons unemployed	BLS	M	L	Lg	U	
Civilian unemployment rate	BLS	M	L	Lg	U	
Industrial production index	FRB	M	C	C	C	Y
Total industry capacity utilization rates	FRB	M	L	C	U	
Consumer price index for services	BLS	M	Lg	Lg	Lg	Y
Building permits, new private housing units	Census	M	L	L	L	Y

Acronyms:

CF: Conference Board
 BLS: Bureau of Labor Statistics
 DOL: Department of Labor
 FRB: Federal Reserve Board

M: Monthly
 Q: Quarterly

L: Leading indicator
 C: Coincident indicator
 Lg: Lagging indicator
 U: Unclassified
 Y: Yes

Table 3

Major Business Cycle Indicators Prepared by Non Federal Statistical Organizations

Indicator	Organization	Frequency	Business cycle behavior			Part of CF composite economic indexes
			Peak	Trough	Overall	
Real manufacturers' new orders, consumer goods and materials	CF	M	L	L	L	Y
Manufacturers' new orders, nondefense capital goods	CF	M	L	L	L	Y
Index of supplier deliveries, vendor performance	NAPM	M	L	L	L	Y
Index of stock prices, 500 common stocks	S&P	M	L	L	L	Y
Real money supply, M2	CF	M	L	L	L	Y
Interest rate spread, 10-year Treasury bonds less federal funds	FRB	M	L	L	L	Y
Index of consumer expectations	U of MI	M	L	L	L	Y
Labor cost per unit of output, manufacturing	CF	M	Lg	Lg	Lg	Y
Average prime rate charged by banks	FRB	M	Lg	Lg	Lg	Y
Commercial and industrial loans	CF	M	Lg	Lg	Lg	Y
Ratio, consumer installment credit outstanding to personal income	CF	M	Lg	Lg	Lg	Y

Acronyms:

CF: Conference Board
 FRB: Federal Reserve Board
 NAPM: National Association of Purchasing Management
 S&P: Standard & Poor's
 U of MI: University of Michigan Survey Research Center

M: Monthly
 Q: Quarterly

L: Leading indicator
 C: Coincident indicator
 Lg: Lagging indicator
 Y: Yes

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