THE CONFERENCE BOARD

Trusted Insights for Business Worldwide

The Role of Composite Indexes in Tracking the Business Cycle

INTERNATIONAL SEMINAR ON EARLY WARNING AND BUSINESS CYCLE INDICATORS
14 December 2009, Scheveningen, The Netherlands

www.conference-board.org

Ataman Ozyildirim
Associate Director, U.S. and Global Indicators Program
a.ozyildirim@conference-board.org

Business cycles defined

"Business cycles are a type of fluctuation found in the **aggregate economic activity** of nations that organize their work mainly **in business enterprises**: a cycle consists 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; **this sequence of changes is recurrent but not periodic**; in duration business cycles vary from **more than one year to ten or twelve years**; they are **not divisible into shorter cycles** of similar character with amplitudes approximating their own."

Wesley C. Mitchell, (1927), *Business Cycles: The Problem and Its Setting,* New York, NY: National Bureau of Economic Research.

Burns, A. F., and Mitchell, W. C. (1946), *Measuring Business Cycles,* New York, NY: National Bureau of Economic Research.

Source: The Conference Board

Business cycles and indicators

- The indicator approach, one of several techniques of business cycle analysis, has been a major component of the NBER program since Burns and Mitchell (1946).
- The first list of leading indicators dates back to Mitchell and Burns (1938).
- Major revisions: Moore (1950), Moore (1961), Moore and Shiskin (1967), Zarnowitz and Boschan (1975), Hertzberg and Beckman (1989), and The Conference Board (2001).
- Also, other changes on a smaller scale occasionally (removal of a component in 1987 by The U.S. Commerce Department, re-introduction of trend adjustment in 2005 by The Conference Board).

2008 recession: "Most talked about…least predicted…"
Martin Wolf, Financial Times

- LEI for the U.S. sideways from January 2006 and diffusion roughly around 50 percent
- Housing market and yield spread down, but money growth was keeping the LEI from falling further
- 6m diffusion did fall below 50 by May 2007 and LEI peaked in July 2007, and
- CEI peaked in November 2007
- Initially mild contractions, deepening in the second half of 2008
- LEI seems to have a trough in March 2009
- While CEI hasn't picked up yet (but a bottom seems to be forming)
- But, LEI growth is already losing some steam in the last couple of months as its growth rate stabilizes

Tracking cyclical movements

- Wide-range of indicators
  - Money and credit indicators
  - Manufacturing indicators
  - Labor market indicators
  - Investment indicators
  - Consumer and business confidence
- Composite coincident and leading index summarize and emphasize cyclical movements
- Looking beyond irregular and seasonal movements in data to the common and regular cyclical fluctuations

U.S. Business Cycle Indicators Database contains more than 250 series

BCI-02 - Labor Force, Employment, and Unemployment

BCI-03 - Output, Production, and Capacity Utilization

BCI-04 - Sales, Orders, and Deliveries

BCI-05 - Fixed Capital Investment

BCI-06 - Inventories and Inventory Investment

BCI-07A - Prices-Producer & Consumer

BCI-07B - Prices-Commodity price detail

BCI-09 - Wages, Labor Costs and Productivity

BCI-10 - Personal Income and Consumer Attitudes

BCI-12 - Money, Credit, Interest Rates, and Stock Prices

BCI-13 - National Defense

BCI-14 - Exports and Imports

BCI-15A - Int'l Comparisons-Industrial Production & Consumer Prices

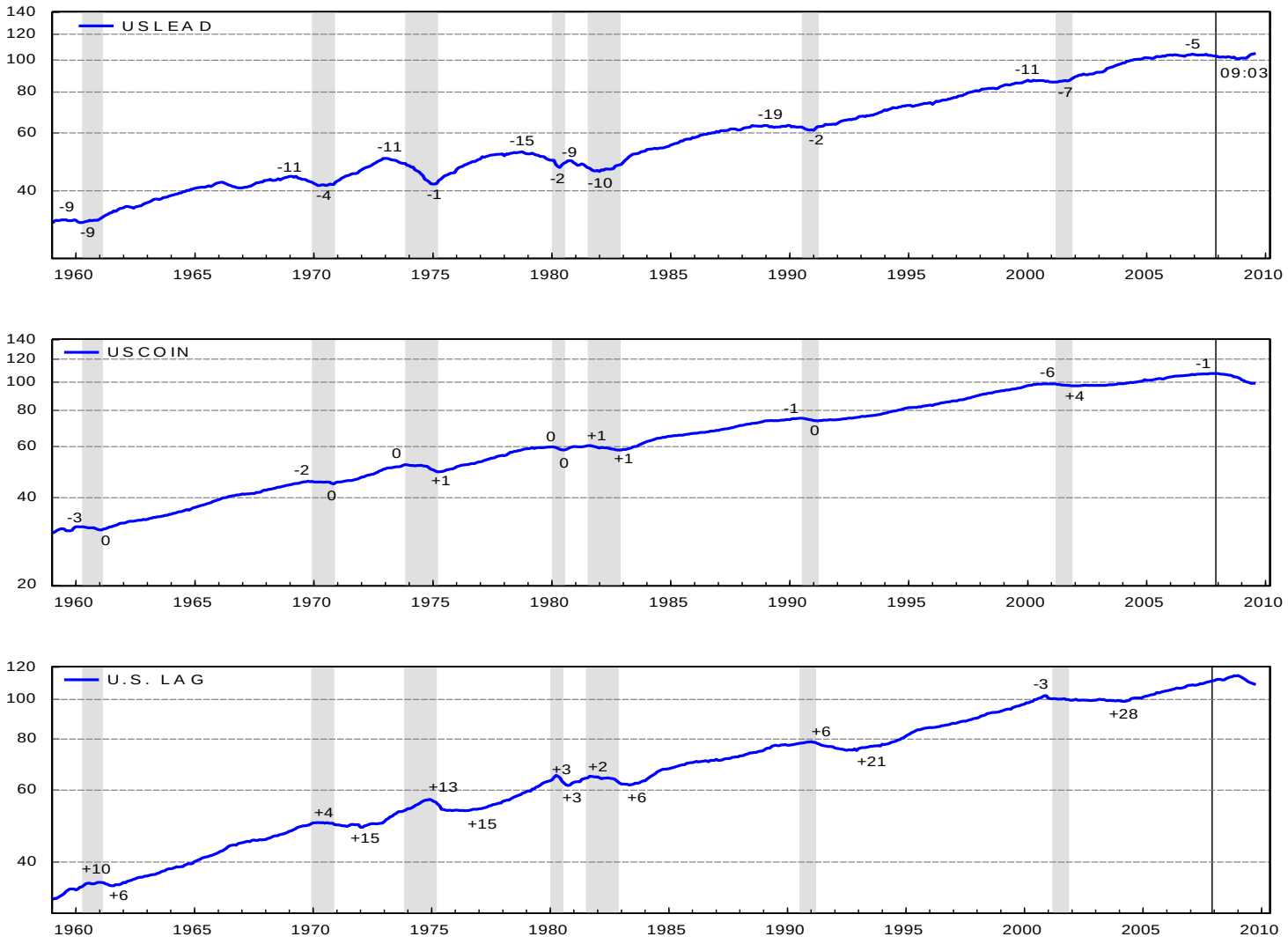
BCI-15B - Int'l Comparisons-Stock Price Indexes & Exchange Rates

- Composite coincident, leading, and lagging indexes combine best indicators to bring out and summarize common cyclical movements

Deciding whether or not to include a leading indicator in the composite index:

- The indicator is economically significant.
- The indicator measurement is statistically sound.
- The index has fewer false signals (*extra cycles*) historically when a new component is included.
- The inclusion of a component enables an index to track a cycle that might be *missed otherwise*.
- A significant improvement in the cyclical timing pattern, in terms of its *consistency and conformity*, of the new index after the inclusion of the new component.
- The index is *smoother* with better articulated turning points.
- There is an improvement in the cyclical behavior of the new index to the cyclical behavior of aggregate economic activity after the inclusion of the new component.

The Conference Board Economic Indexes for the U.S.



Note: Shaded areas represent recessions as determined by the NBER Business Cycle Dating Committee. The numbers denote the leads in months at cyclical peaks and troughs.
Source: The Conference Board

Data Needs and Timeliness Issues

- Historical data required for construction
- Seasonal adjustments and price deflators necessary
- Timely data required for real time monitoring
  - Dealing with publication lags

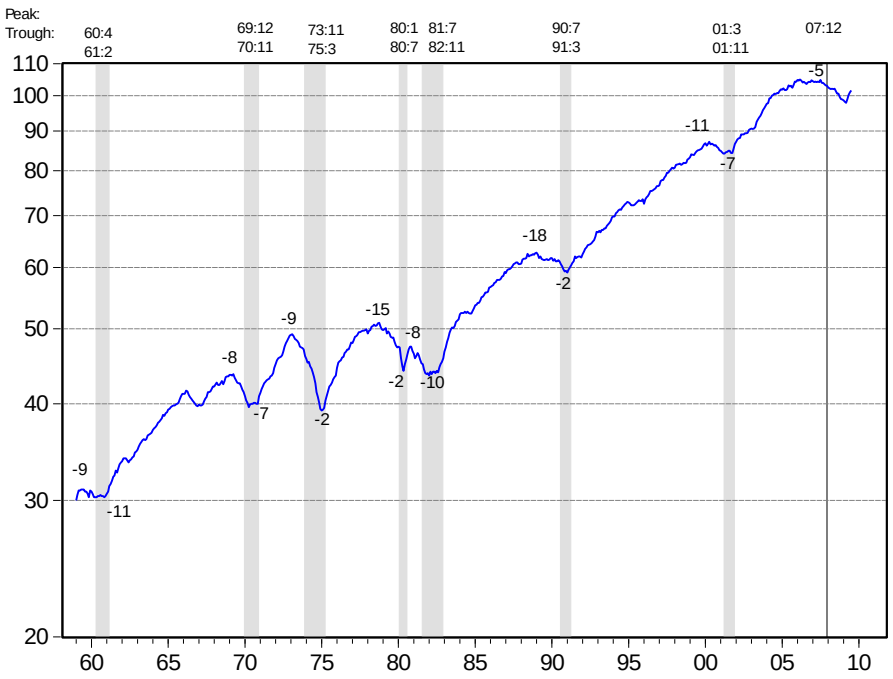
Business cycles are asymmetric and relatively infrequent

Major cyclical fluctuations of the LEI correspond to and predict business cycle turning points

5 recessions in 25 years

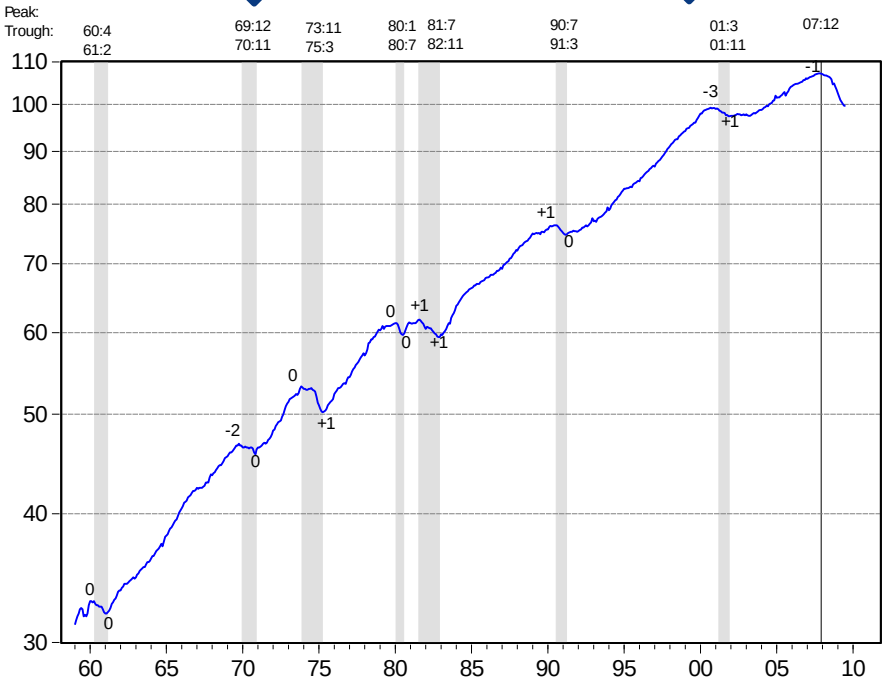
3 recessions in 25 years

U.S. Leading Economic Index



Note: Shaded areas represent recessions as determined by the National Bureau of Economic Research.
The numbers denote the leads in months at cyclical peaks and troughs.

U.S. Coincident Economic Index

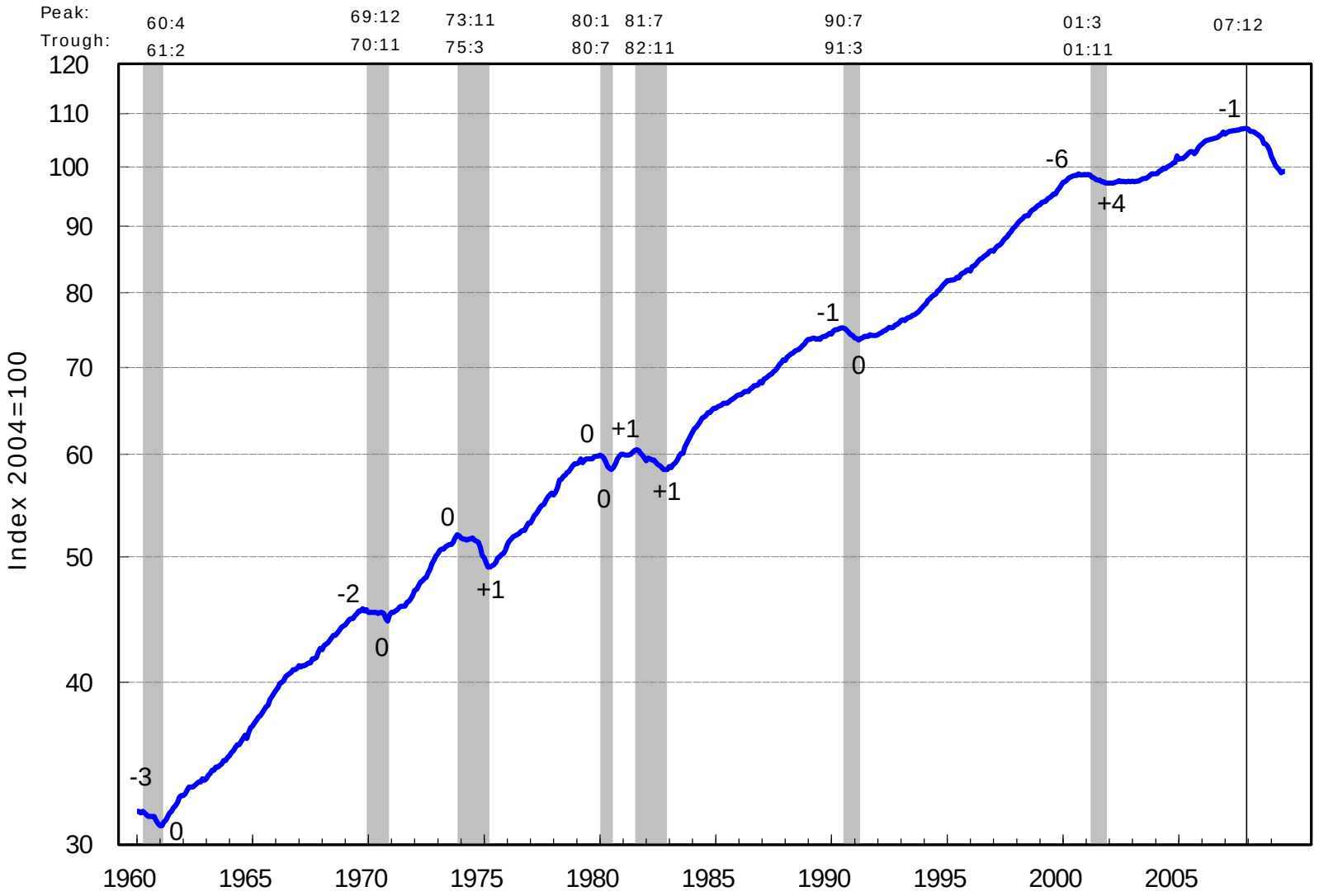


Note: Shaded areas represent recessions as determined by the National Bureau of Economic Research.
The numbers denote the leads or lags in months at cyclical peaks and troughs.

Note: Shaded areas represent recessions as determined by the NBER Business Cycle Dating Committee.

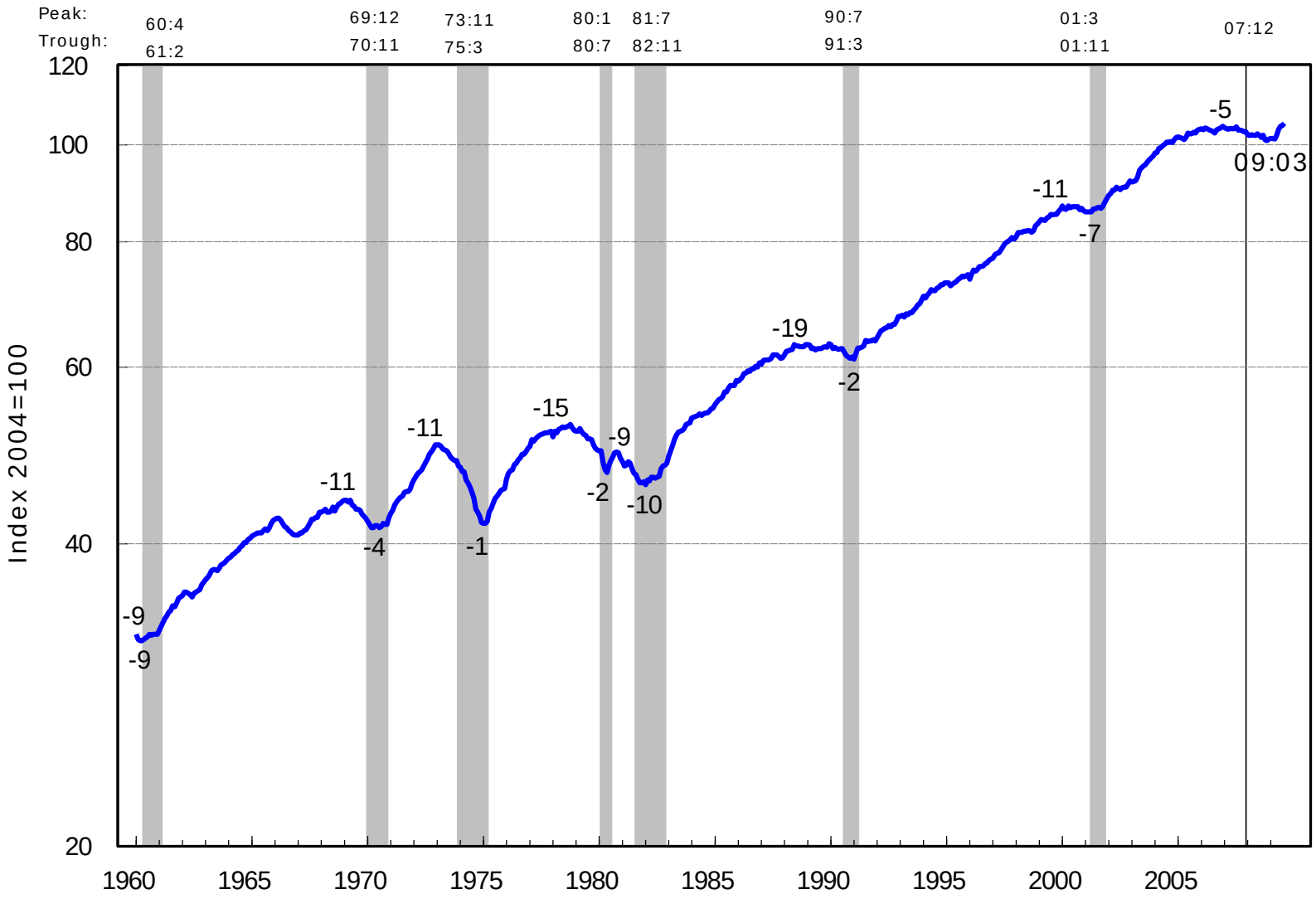
Source: The Conference Board

The Conference Board Coincident Economic Index™ (CEI) for the U.S.



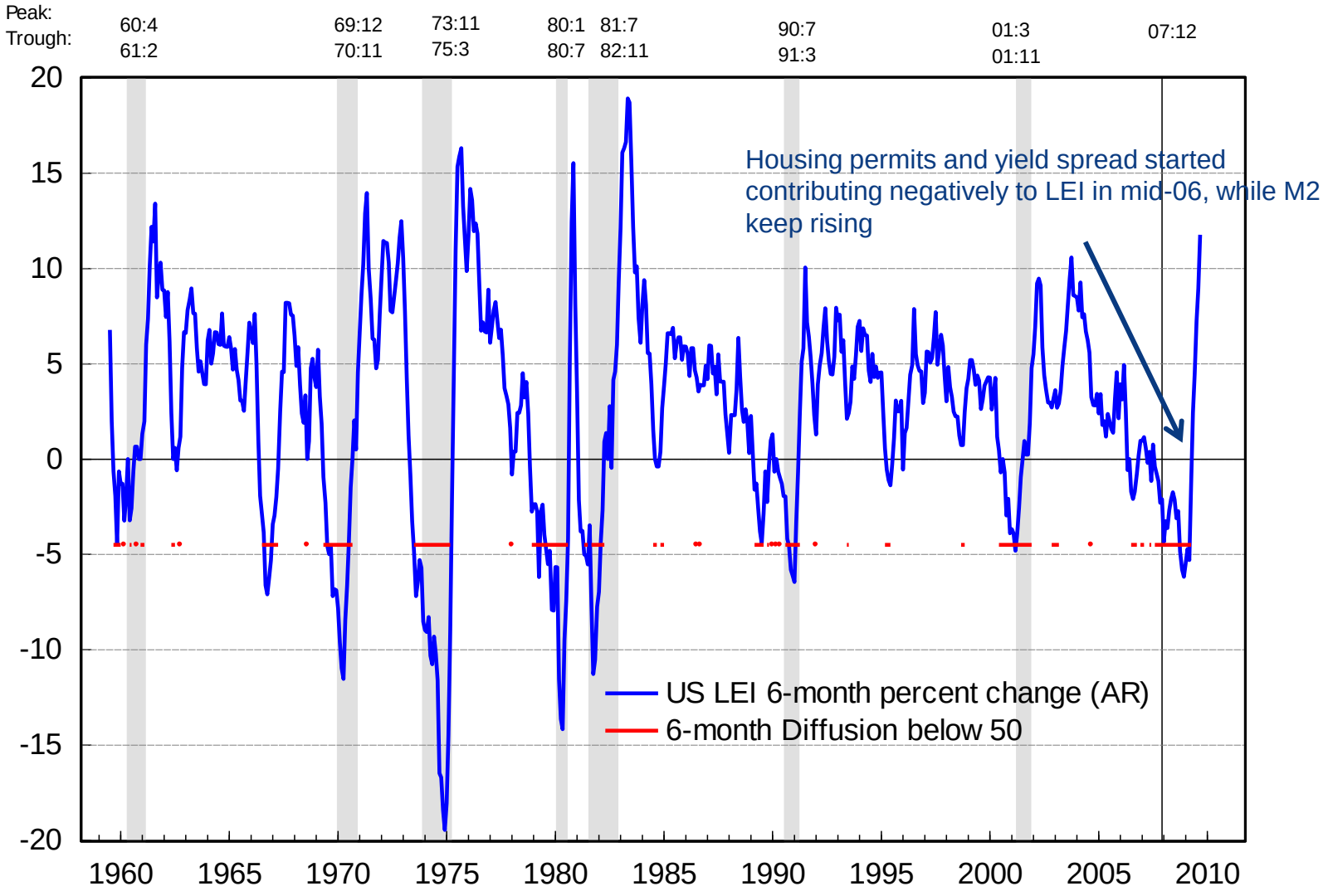
Note: Shaded areas represent recessions as determined by the NBER Business Cycle Dating Committee. The numbers denote the leads in months at cyclical peaks and troughs.
Source: The Conference Board

The Conference Board Leading Economic Index™ (LEI) for the U.S.



Note: Shaded areas represent recessions as determined by the NBER Business Cycle Dating Committee. The numbers denote the leads in months at cyclical peaks and troughs.
Source: The Conference Board

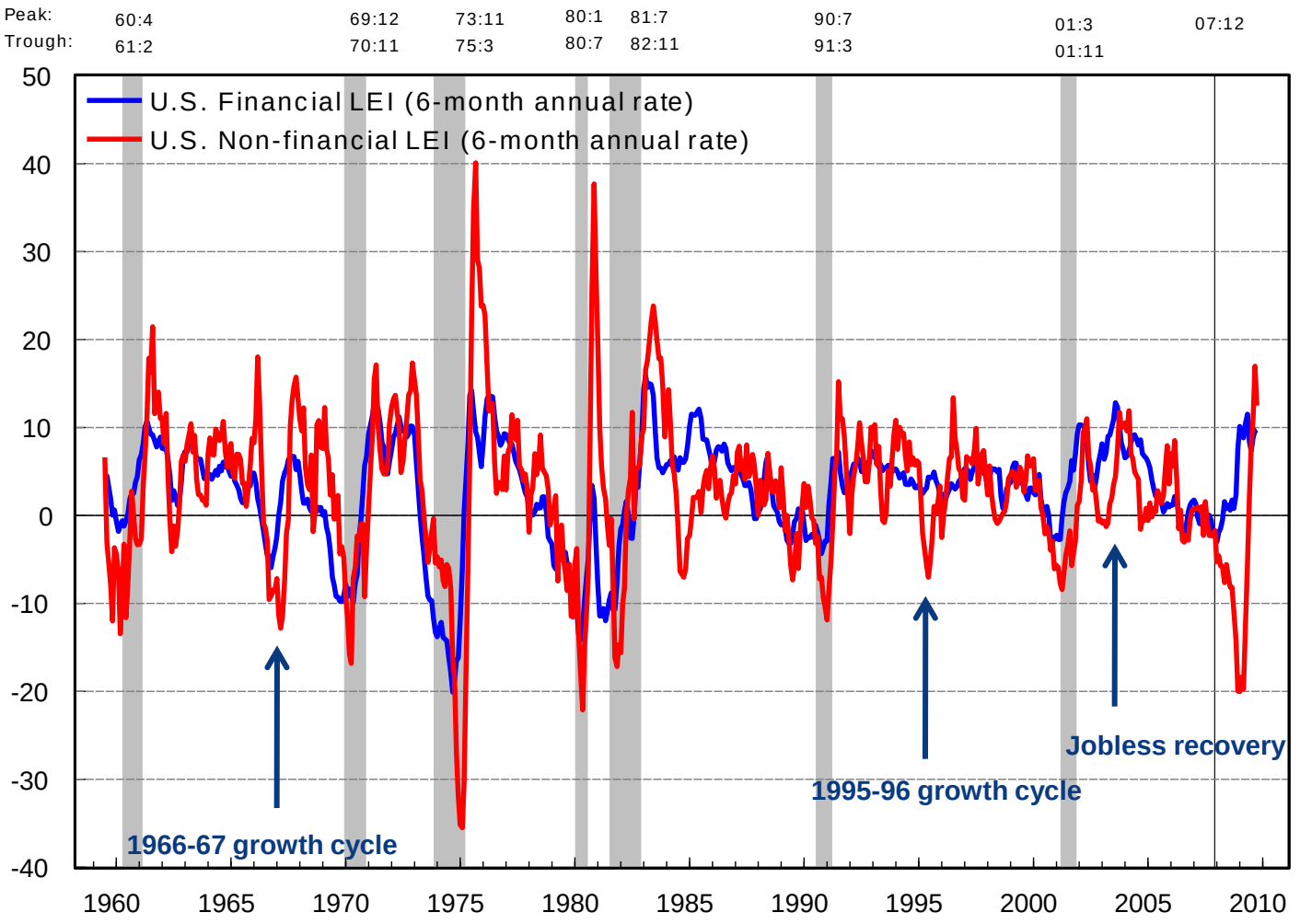
Depth, Duration, and Diffusion (3D's) help predict recessions



Note: Shaded areas represent recessions as determined by the NBER Business Cycle Dating Committee.

Source: The Conference Board

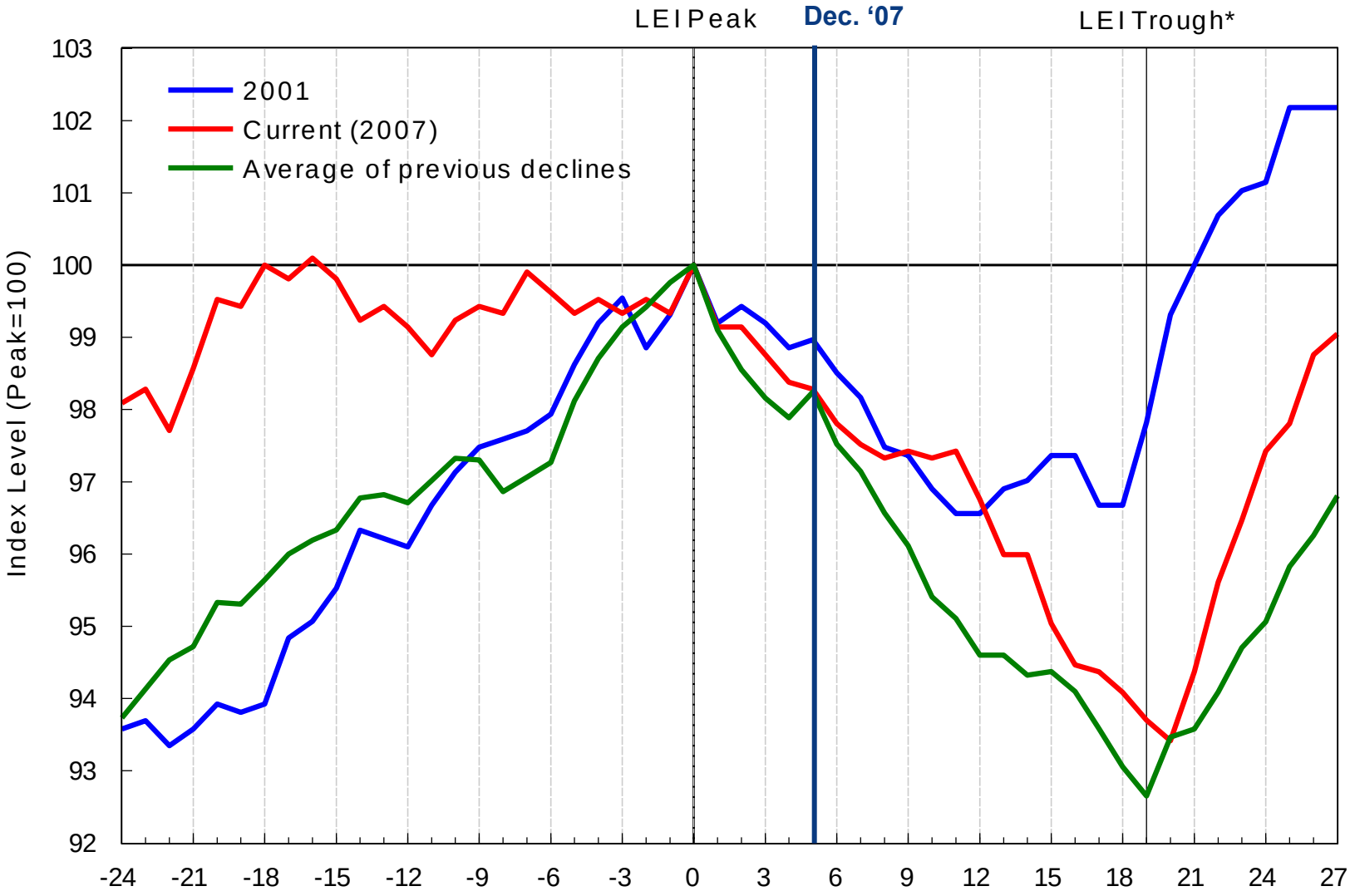
Financial and Nonfinancial subindexes help to understand the cyclical drivers



Note: Shaded areas represent recessions as determined by the NBER Business Cycle Dating Committee.

Source: The Conference Board

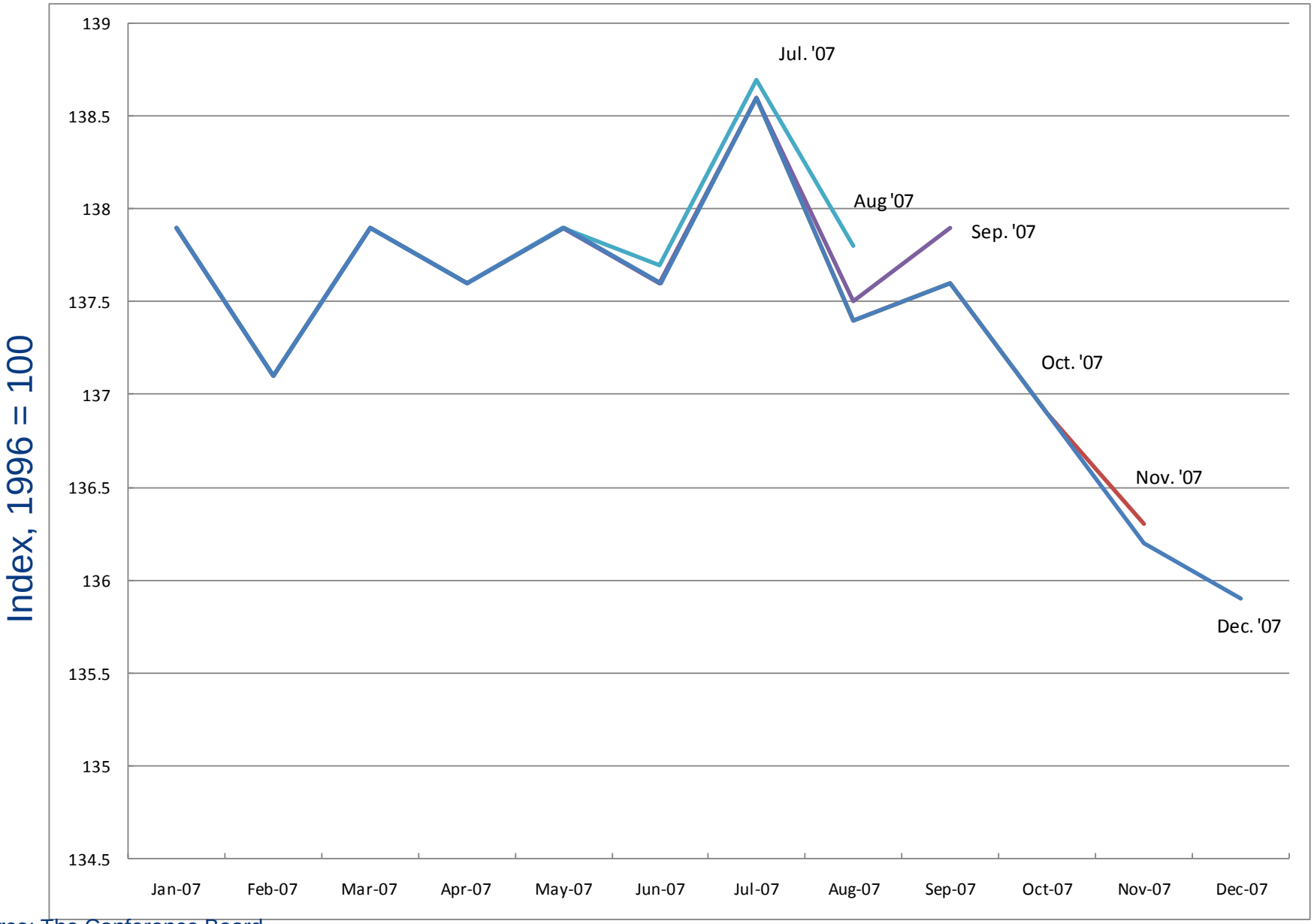
Comparison of LEI behavior during previous recessions



*LEI Trough refers to trough in "Average of Previous Declines"

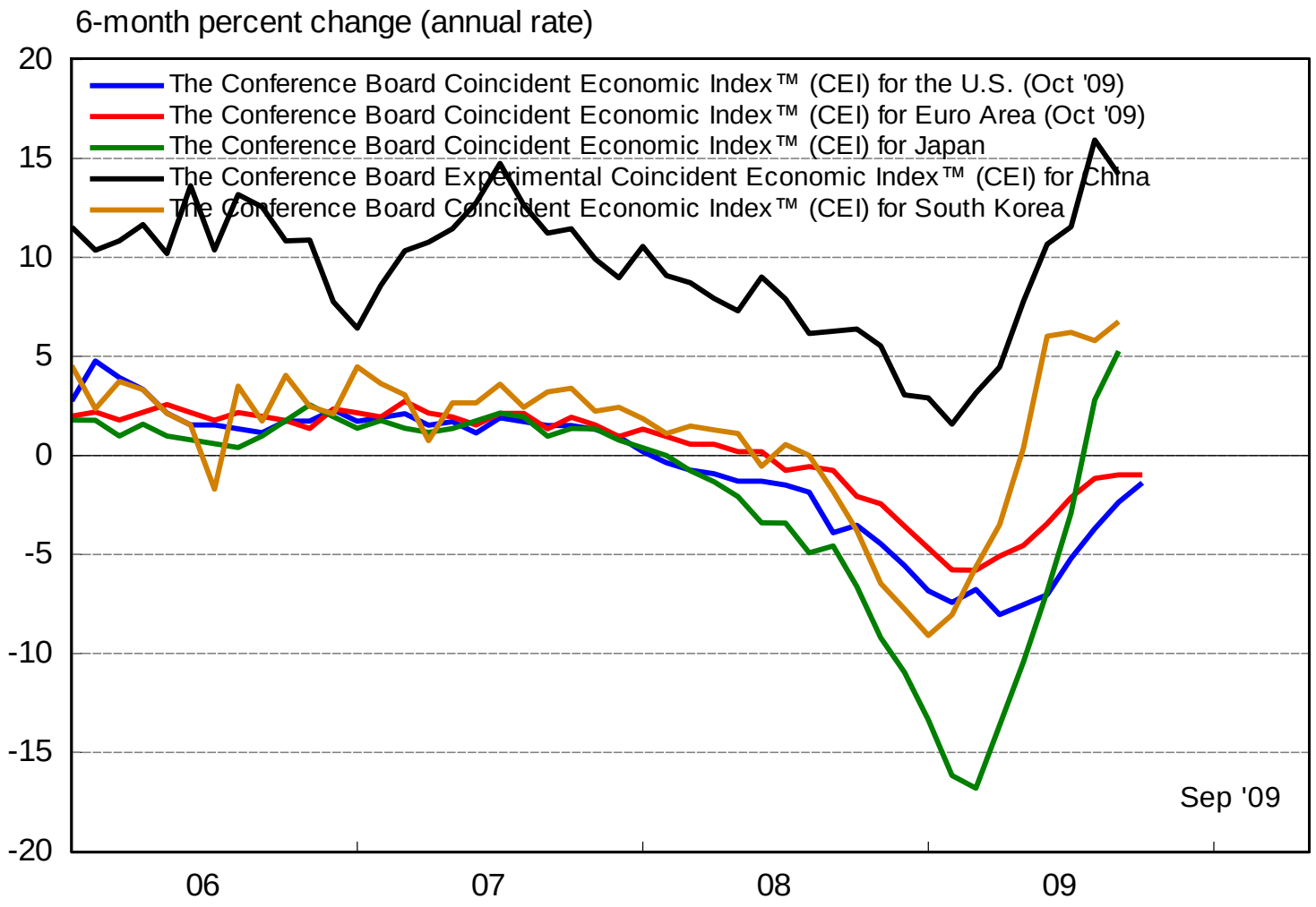
Source: The Conference Board

U.S. LEI in real time: January 2007 – December 2007



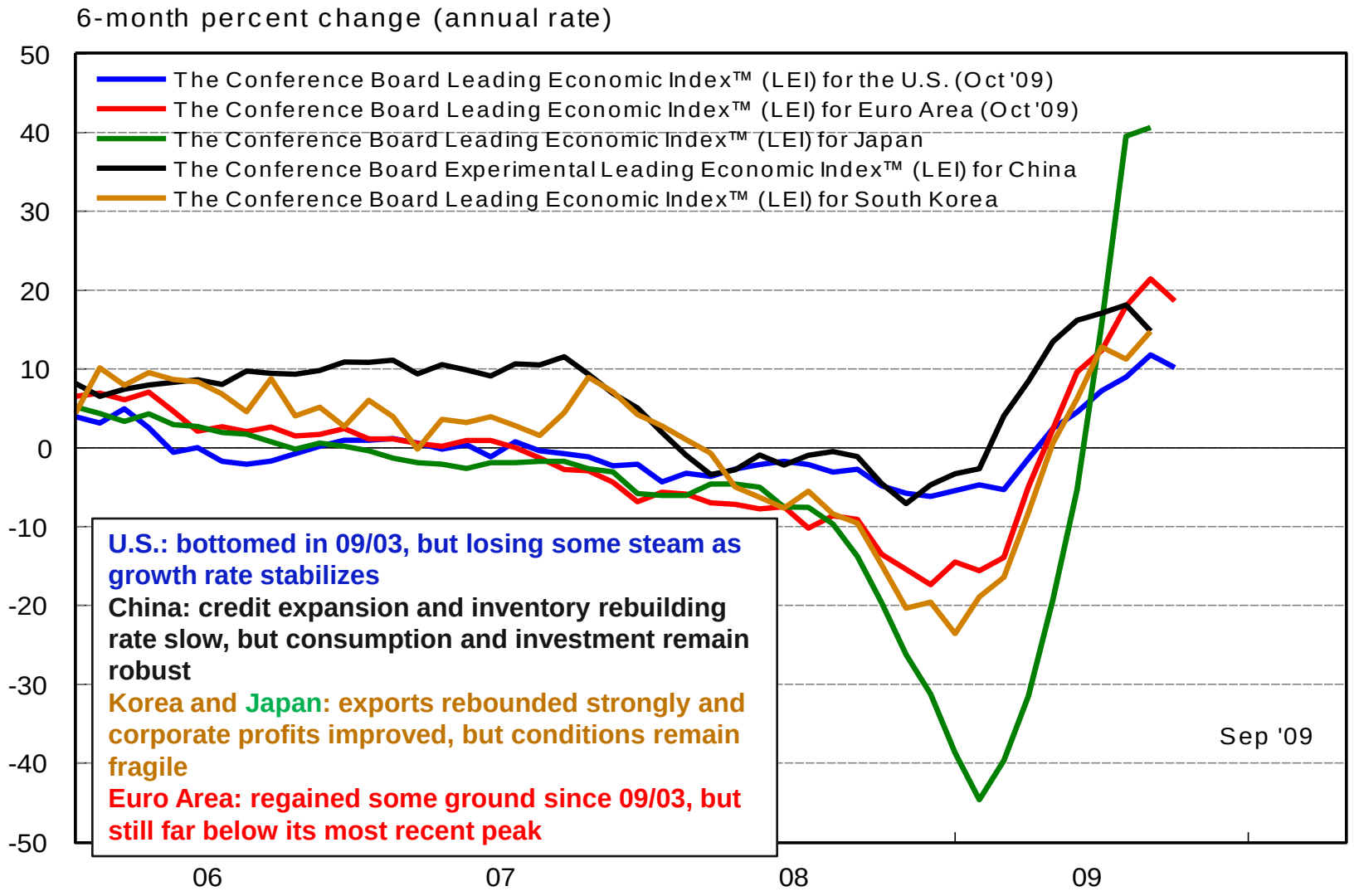
Source: The Conference Board

Coincident Economic Indexes suggest world economy is currently passing through the trough



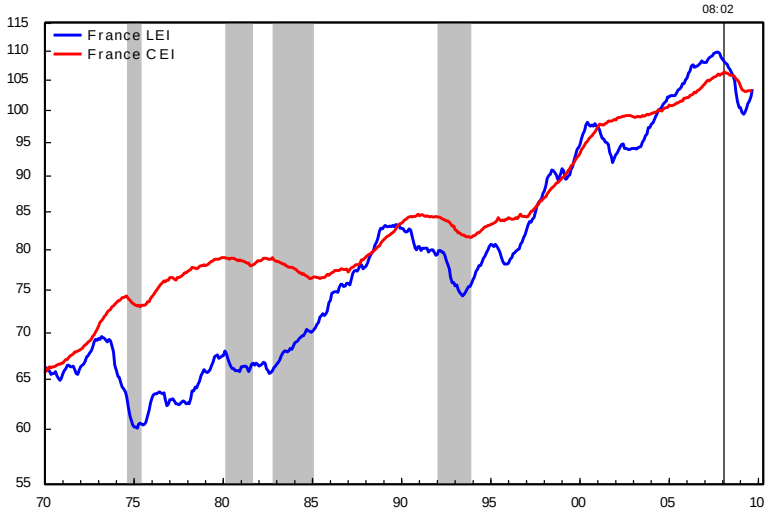
Source: The Conference Board

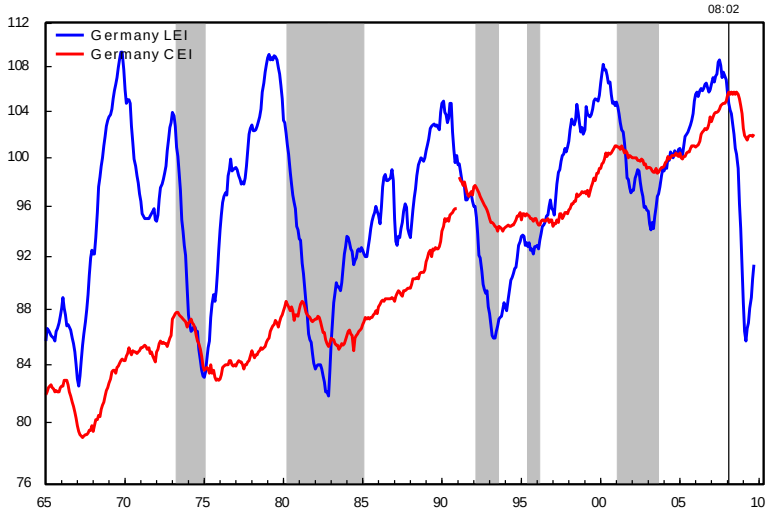
LEI for the U.S., Euro Area, Japan, China, and Korea all show improvement since March '09

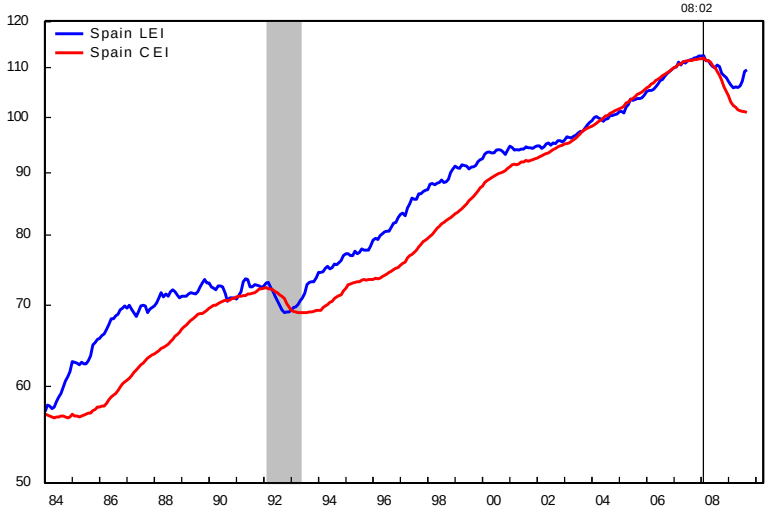


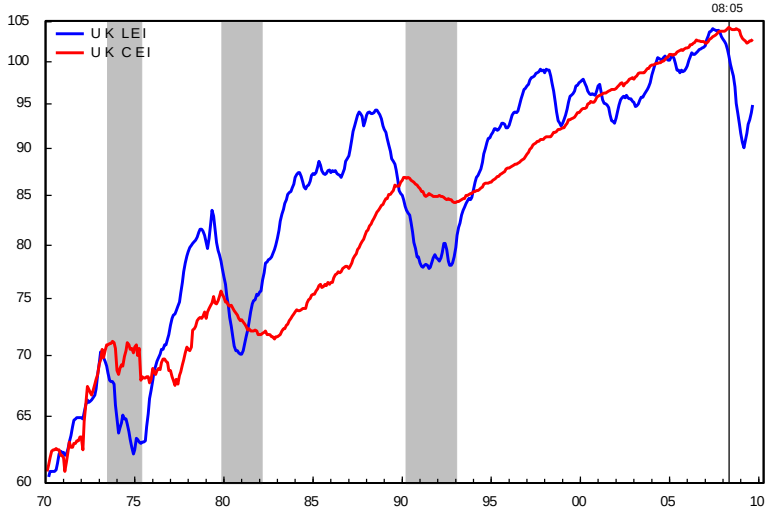
Source: The Conference Board

LEI and CEI for France, Germany, Spain, and UK





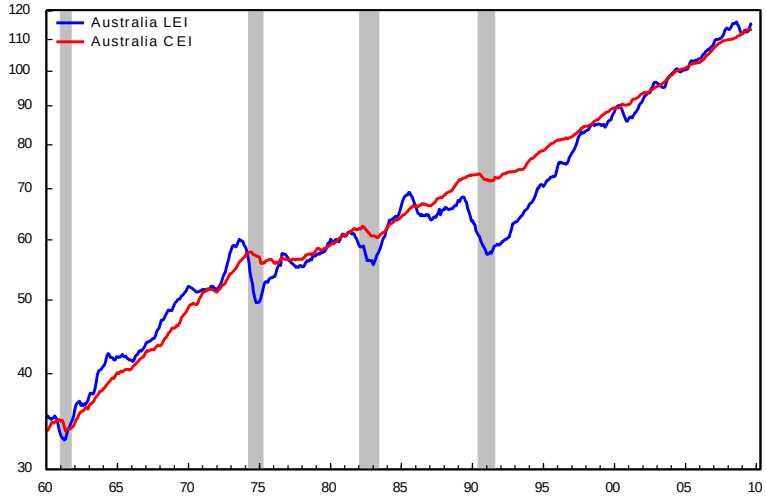


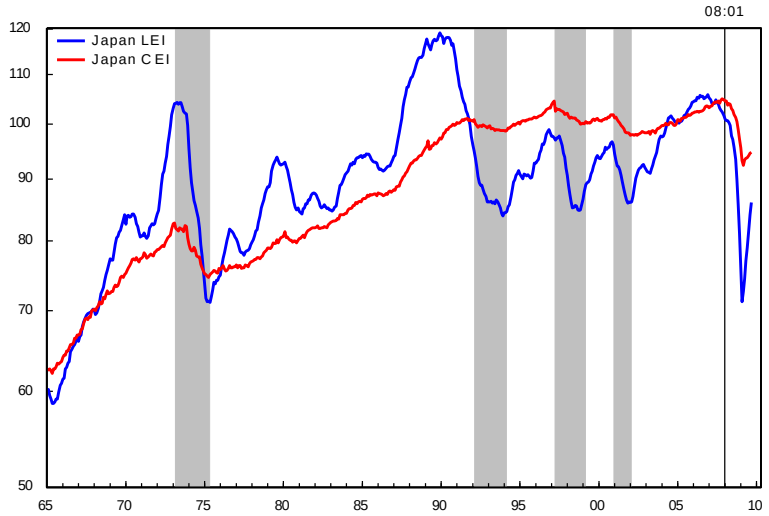


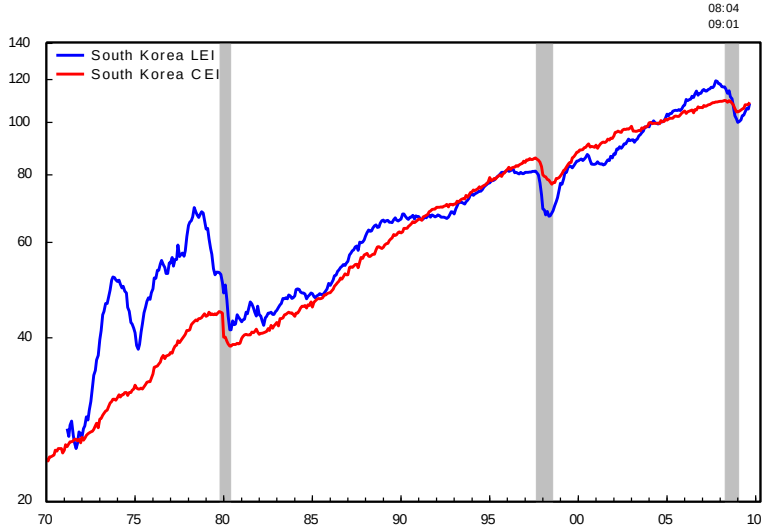
Note: Shaded areas represent business cycle recessions determined by CEI and GDP.

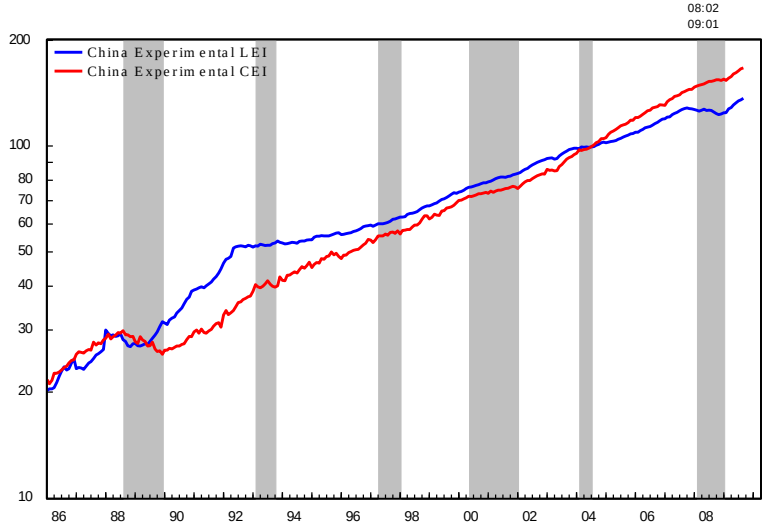
Source: The Conference Board

LEI and CEI for Australia, Japan, Korea, and China (experimental)





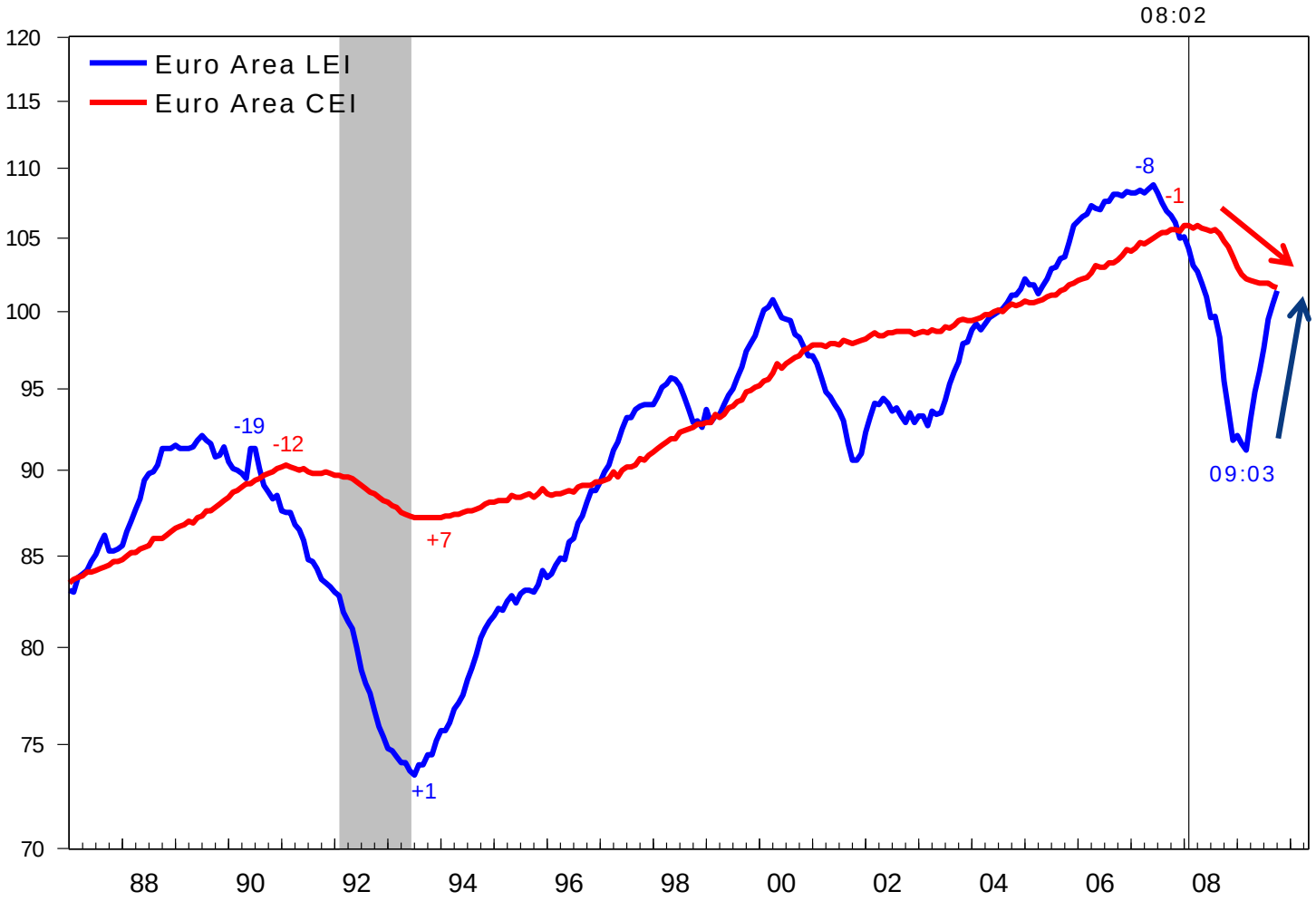




Note: Shaded areas represent business cycle recessions determined by CEI and GDP. For China, shaded areas represent growth cycles of China's CEI.

Sources: The Conference Board

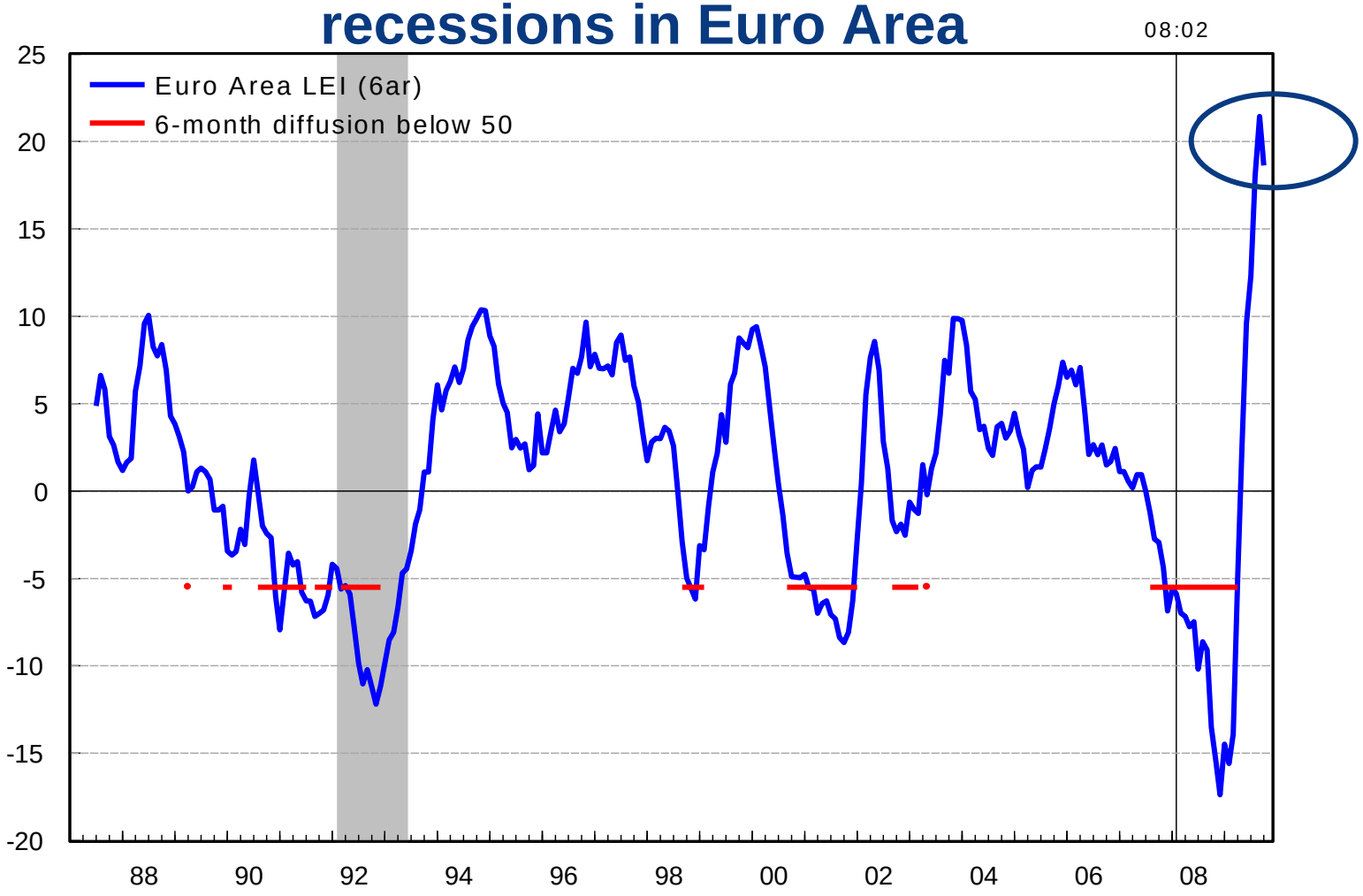
LEI and CEI for the Euro Area before and during the recession



Note: Shaded areas represent business cycle recessions of Euro Area, determined by CEI and GDP.

Source: The Conference Board

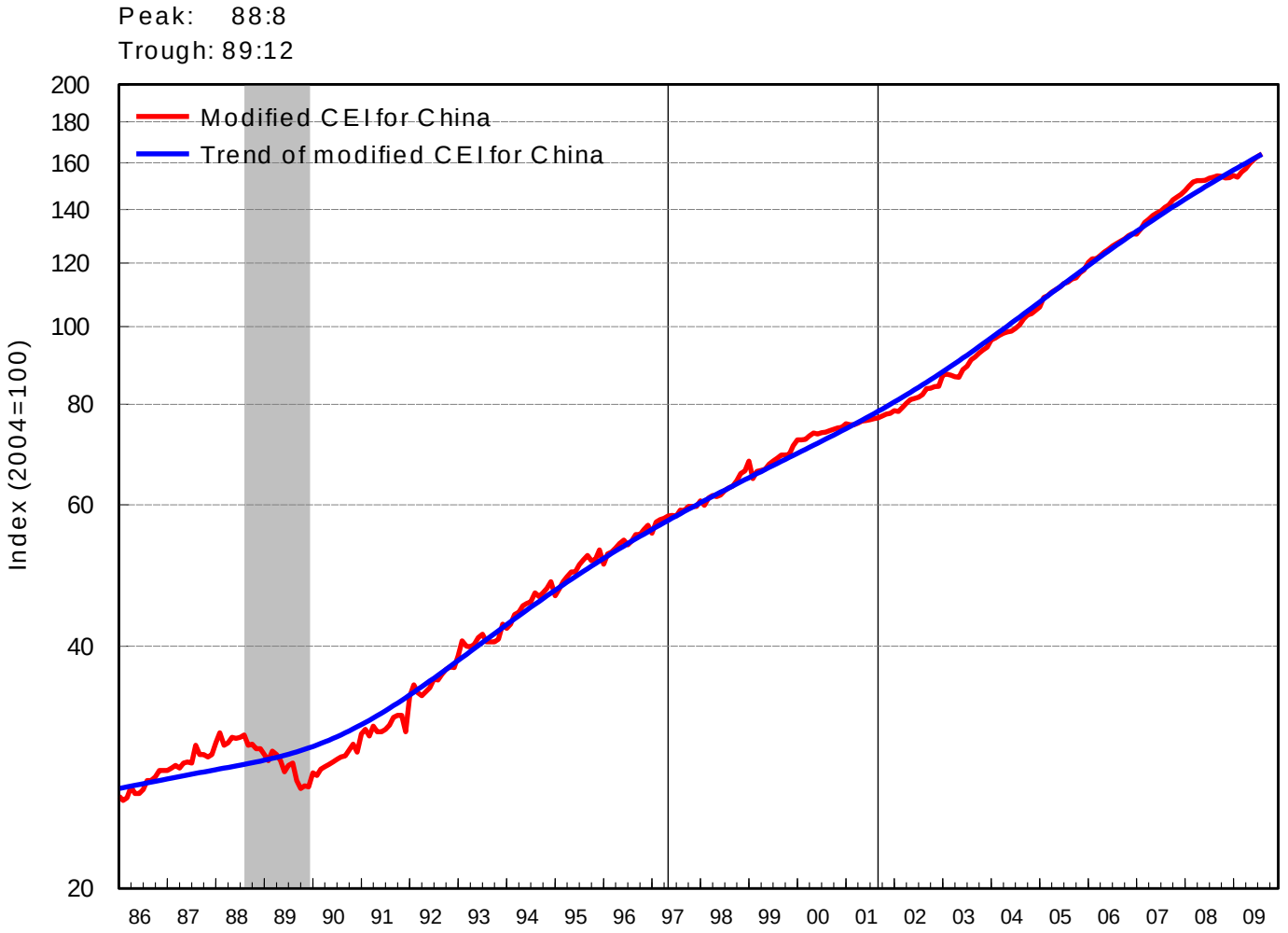
Depth, Duration, and Diffusion (3D's) help predict recessions in Euro Area



Note: Shaded areas represent business cycle recessions of Euro Area, determined by CEI and GDP.

Source: The Conference Board

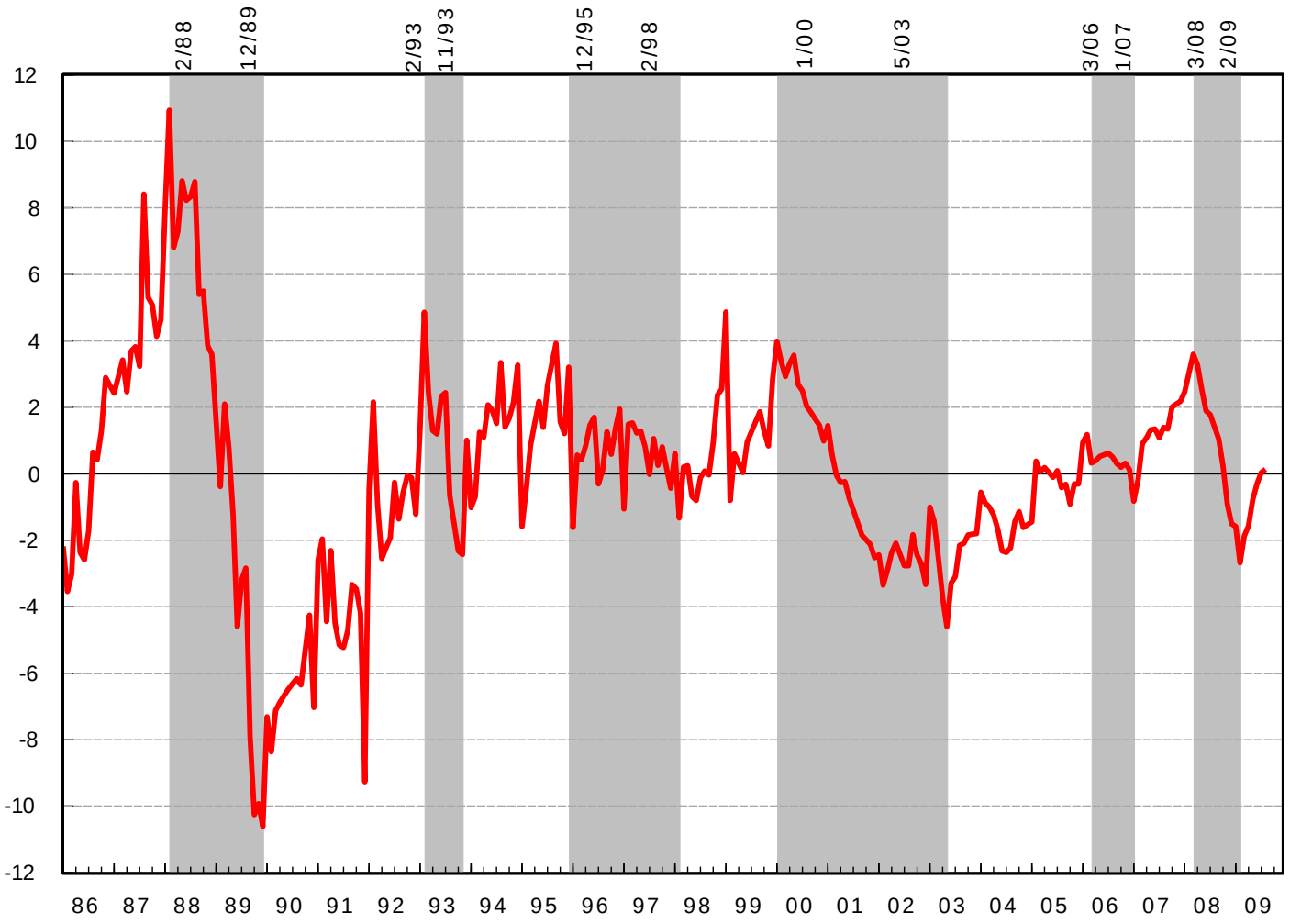
Trend of China Experimental CEI Growth



Note: Shaded area represents China's economic recession using CEI, and the turning points are determined by the Bry-Boschan algorithm.

Source: The Conference Board

Growth Cycles in the China Experimental CEI



Note: Shaded areas represent growth cycles of China's CEI, and the turning points are determined by the Bry-Boschan algorithm.

Source: The Conference Board

Economic indicators for tracking cyclical movements

- **"Business cycles**…in the **aggregate economic activity**…**sequence of changes is recurrent but not periodic**…vary from **more than one year to ten or twelve years**…**not divisible into shorter cycles"**
- Composite indexes help define, emphasize, and predict cyclical movements.
- Producers of cyclical indicators must be sensitive to the effects of real changes in the economy's structure, institutions, and policies.
- Thus, new series have been added when accumulating evidence suggested strong cyclical performance ahead of recessions.

Business Cycle Chronologies for European Countries

	Europe									
Leading Economic Indexes (LEI)	Euro Area		France		Spain		Germany		United Kingdom	
Turning Points (all countries)	Leading Index		Leading Index		Leading Index		Leading Index		Leading Index	
Timing at Business Cycle Peaks										
1960's							Mar-66	-1		
1970's			Aug-74	-16			Mar-73	-2	Jun-73	-4
									Nov-79	-6
1980's			Feb-80	0			Mar-80	-11		
			Oct-82	-32						
1990's	Feb-92	-19	Jan-92	-16	Feb-92	-9	Feb-92	-24	Mar-90	-20
							May-95	-3		
2000's							Jan-01	-9		
	Feb-08	-8	Feb-08	-5	Feb-08	0	Feb-08	-7	May-08	-11
Mean		-14		-14		-5		-8		-10
Median		-14		-16		-5		-7		-9
St. Deviation		8		12		6		8		7
Extra Turns		3		2		1		2		4
Missed Turns		0		0		0		0		0
Number of Cycles		2		5		2		7		4
Timing at Business Cycle Troughs										
1960's							Feb-67	0		
1970's			May-75	-2			Jan-75	0	May-75	-5
1980's			Aug-81	-8			Nov-82	0	Feb-82	-13
			Jan-85	NA						
1990's	Jun-93	1	Nov-93	-5	May-93	-7	Jul-93	-2	Jan-93	-18
							Feb-96	-4		
2000's							Aug-03	0		
		Mar-09		Mar-09		Mar-09		Mar-09		Mar-09
Mean		1		-5		-7		-1		-12
Median		1		-5		-7		0		-13
St. Deviation		NA		3		NA		2		7
Extra Turns		4		4		2		3		5
Missed Turns		0		1		0		0		0
Number of Cycles		1		4		1		6		3
Combined Statistics										
Mean		-9		-11		-5		-5		-11
Median		-8		-7		-7		-2		-11
St. Deviation		10		11		5		7		6

Source: The Conference Board

Business Cycle Chronologies for Asia Pacific Countries

	Asia-Pacific							
Leading Economic Indexes (LEI)	Australia		Japan		Korea		China*	
Turning Points (all countries)	Leading Index		Leading Index		Leading Index		Leading Index	
Timing at Business Cycle Peaks								
1960's	Dec-60	NA						
1970's	Mar-74	-7	Feb-73	2	Oct-79	-17		
1980's	Jan-82	-7					Aug-88	-7
1990's	May-90	-12	Feb-92	-26	Aug-97	-15		
			Mar-97	-4				
2000's			Dec-00	-1				
		Aug-08	Jan-08	-19	Apr-08	-6		Oct-07
Mean		-9		-10		-13		-7
Median		-7		-4		-15		-7
St. Deviation		3		12		6		NA
Extra Turns		5		5		5		1
Missed Turns		1		0		0		0
Number of Cycles		4		5		3		1
Timing at Business Cycle Troughs								
1960's	Sep-61	-5						
1970's	Mar-75	-4	Apr-75	1				
1980's	May-83	-4			May-80	1	Dec-89	-13
1990's	Jul-91	-5	Feb-94	-14	Jul-98	-2		
			Feb-99	-4				
2000's			Jan-02	-2				
		Jan-09		Feb-09	Jan-09	0		Nov-08
Mean		-5		-5		-1		-13
Median		-5		-3		-1		-13
St. Deviation		1		7		2		NA
Extra Turns		6		5		6		1
Missed Turns		0		0		0		0
Number of Cycles		4		4		3		1
Combined Statistics								
Mean		-6		-7		-8		-10
Median		-5		-4		-6		-7
St. Deviation		3		10		8		4

* China's business cycle is determined by turning points in CEI

Source: The Conference Board