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Forthcoming Revisions to the Index of Leading Economic Indicators

By

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The July 2005 release will incorporate two major revisions to the composite index of economic indicators (LEI): 1) a trend adjustment to the LEI and 2) a new method for calculating the contribution of the yield spread in the LEI. This article describes these revisions and compares the current version of the LEI (old LEI) with the new version released in July 2005 (new LEI). The trend adjustment facilitates interpretation and use of the LEI. The new measure of the yield spread improves the performance of the LEI by better reflecting the way the yield spread anticipates cyclical turning points.

There are no changes to the composition of the coincident or lagging indexes. But in order to maintain data consistency with the LEI, the histories of the coincident and lagging indexes will be updated to incorporate new data and standardization factors will be recalculated.[1]

Trend Adjustment to the Leading and Lagging Indexes

Next month's revision also reinstitutes an old and well-known trend adjustment procedure to the leading and lagging indexes. This procedure does not affect the overall cyclical properties of the LEI, but it offers two advantages. First, the long-term trend in the LEI will be "fixed" as the procedure equates the trend in the LEI to the trend, measured by the average growth rate, in the coincident index (CEI). This means that the trend of the LEI will be invariant to changes in the composition of the index or set of

[1] The official data and factors will be released with the July 21, 2005 press release. Because the benchmark revisions will be effective with the July 21, 2005 release, the data used in this article and standardization factors and trend adjustment factors reported may change slightly.

indicators used to calculate it. This facilitates the interpretation of the indexes as cyclical measures and provides a more consistent framework for their use.

Second, the trend adjustment makes the growth of the leading and lagging composite indexes more similar to that of the coincident index. In turn, the levels of these indexes are more meaningful since the coincident index is a measure of current economic activity. While the composite indexes are mainly used to indicate directional changes in aggregate economic activity, many users also regard them as measures of the level of economic activity. The trend adjustment facilitates this use.

The trend adjustment is accomplished by adding an adjustment factor to the monthly growth rate of the LEI. The adjustment factor is computed by subtracting the average monthly growth rate of the LEI (0.230) from the average monthly growth rate of the CEI (0.216) over the period of 1959 – 2003, making the adjustment factor -0.014. This adjustment factor is then added every month to the growth rate of the LEI. The adjustment factor for the lagging index is 0.175. These trend adjustment factors will be updated once a year during the regular annual benchmark revisions of the composite indexes which usually takes place in January.

Revision to the yield spread component in the Leading Index

The new measure of the yield spread, one of the current components of the LEI, uses the same interest rate spread (10-year Treasury note minus fed funds rate) in the calculations as in the old index. The revision involves a shift from using the yield spread by itself to using the cumulative sum of the yield spread. The primary effect of this revision is to change the way the contribution of the yield spread is calculated.

The LEI has ten components and the monthly contribution calculation is based on monthly changes in each component. With the revision, the contribution of the yield spread will be calculated from the value of the yield spread in a given month instead of its change over the previous month. Currently, the yield spread contributes negatively to

the LEI whenever the spread is declining and this happens before recessions, but at many other times as well. A component is said to contribute negatively to the LEI when it reduces the value of the index, all else equal, i.e., the monthly change in the component slows the growth rate of the index.

The new measure will contribute negatively to the LEI only when the spread inverts; that is, when the long rate is less than the short rate. The cumulative measure of the yield spread provides a less "noisy" leading indicator, one that better reflects the effect of the yield spread on future economic activity (Chart 2).

As an example, consider the values of the interest rate spread in April and May 2005: 1.55 and 1.14, respectively. Under the old method, the contribution of the yield spread in May is calculated by multiplying the monthly change between the two months (1.14 – 1.55) by its standardization factor. With the new cumulative yield spread measure, the monthly change is in effect the level of the yield spread; therefore the same contribution for May will be calculated by multiplying the level of the yield spread, 1.14, by its standardization factor.

Table 1 lists the components of the leading index and shows the new standardization factors that are associated with each component. The standardization factors scale how much of a component's monthly change contributes to the growth rate of the index and are intended to keep components with large month to month fluctuations from dominating the index. Thus, standardization factors are used to equalize the volatility of each component and are calculated from the inverse standard deviations of monthly changes in each component. In addition, the inverse standard deviations are made to sum to 1 and multiplied with their respective component's monthly change to get each component's contribution to the index.

With the July 2005 revision, the standardization factors are also revised. The standard deviation of the monthly change in the cumulative yield spread in the new LEI (1.28) is higher than that of the monthly change in the raw yield spread in the old LEI

(0.31), which makes its standardization factor smaller than before (Chart 1 and Table 1). Thus, in the old LEI the yield spread's monthly change is multiplied by a standardization factor of 0.33 but in the new LEI the yield spread is multiplied by a factor of 0.10.[2]

Other revisions to the leading indicators

The monthly contributions of both *Vendor Performance* (BCI series 32) and *Index of Consumer Expectations* (BCI series 83) will now be calculated using simple difference instead of percent change. Vendor Performance, a diffusion index, is already in percentage form, so a simple difference is more appropriate. The Index of Consumer Expectations, while not in percentage form, is a stationary variable – it does not have an upward trend and fluctuates largely within a limited range – and therefore it is sufficient to take its simple difference instead of percent change over the previous month. These changes simplify the index calculation and have little effect on the cyclical performance of the composite leading index.

Turning Points in the New Leading and Lagging Indexes

It is important to note that comparisons of the old and new indexes should be made between trend adjusted versions. The trend of the old index is an artifact of its selected components, whereas, the trend of the new index is fixed to the CEI trend. A direct comparison between these two indexes is not possible because their methodologies differ. We present the trend adjusted version of the old index, and the new index in Chart 2a, which illustrates the overall similar cyclical behavior of the two trend adjusted indexes. We also present the old index in Chart 3a, which illustrates the change in trend. Also note that the cyclical behaviors of all three indexes are very similar.

[2] Note this does not mean that the yield spread constitutes 10 percent of the new LEI as compared with 30 percent of the old LEI since the standardization factor operates to equate the volatility of the individual indicators, which are then multiplied with the respective monthly change in each component and added together (equally weighted) to obtain the LEI.

Chart 3b shows the six-month growth rates of the old (with trend adjustment) and new indexes, and again illustrates the similarity in cyclical behavior between the two.

As shown in Table 2, the turning points at business cycle peaks and troughs of the new LEI are similar to those of the old LEI with trend adjustment. On average the new LEI has a slightly longer lead of about 2 months at peaks and slightly shorter lead of about 1 month at troughs. The substantially longer lead at the 1990 peak (-18 months) is partly responsible for this longer average lead. The trend adjustment improves the LEI by reducing the three extra cycles present in the old LEI to only one extra cycle, which corresponds to the 1966 growth slowdown (Column 1 and 2 in Table 2).

The newly trend-adjusted lagging index shows an improvement (Chart 4a and Chart 4b). Although its broad cyclical characteristics do not change, the average lag at peaks lengthens from one month to almost five, and the average lag at troughs shortens from 14 months to around seven (Table 2).

Next month's issue of Business Cycle Indicators will discuss the yield spread and the reasons for using its cumulative form in more detail. The September issue will describe the trend adjustment procedure and the reason for adopting it in greater detail. All three articles (including this one) will be available on our website at http://www.conference-board.org/economics/bci/ by June 24, 2005.

Conclusion

The trend adjustment gives both the leading and lagging indexes a fixed trend that is meaningful and reflects economic activity as represented by the coincident index. The cumulative yield spread is an improved leading indicator compared to its previous raw form because it is smoother and anticipates turning points in the business cycle better. These changes are the result of research at The Conference Board (TCB) and regular consultations with its Business Cycle Indicators Advisory Panel and other experts. The Conference Board continuously monitors the behavior and performance of the composite

indexes and their components and makes changes from time to time (See BCI Handbook, 2001, for a description of the previous comprehensive revision that The Conference Board undertook in 1996.) This revision is consistent with long-standing TCB policy to make changes to the indexes when research indicates substantial improvements are possible. The Conference Board also undertakes maintenance revisions yearly, normally in January, when the histories of the composite indexes are benchmarked to reflect data revisions.

Chart 1

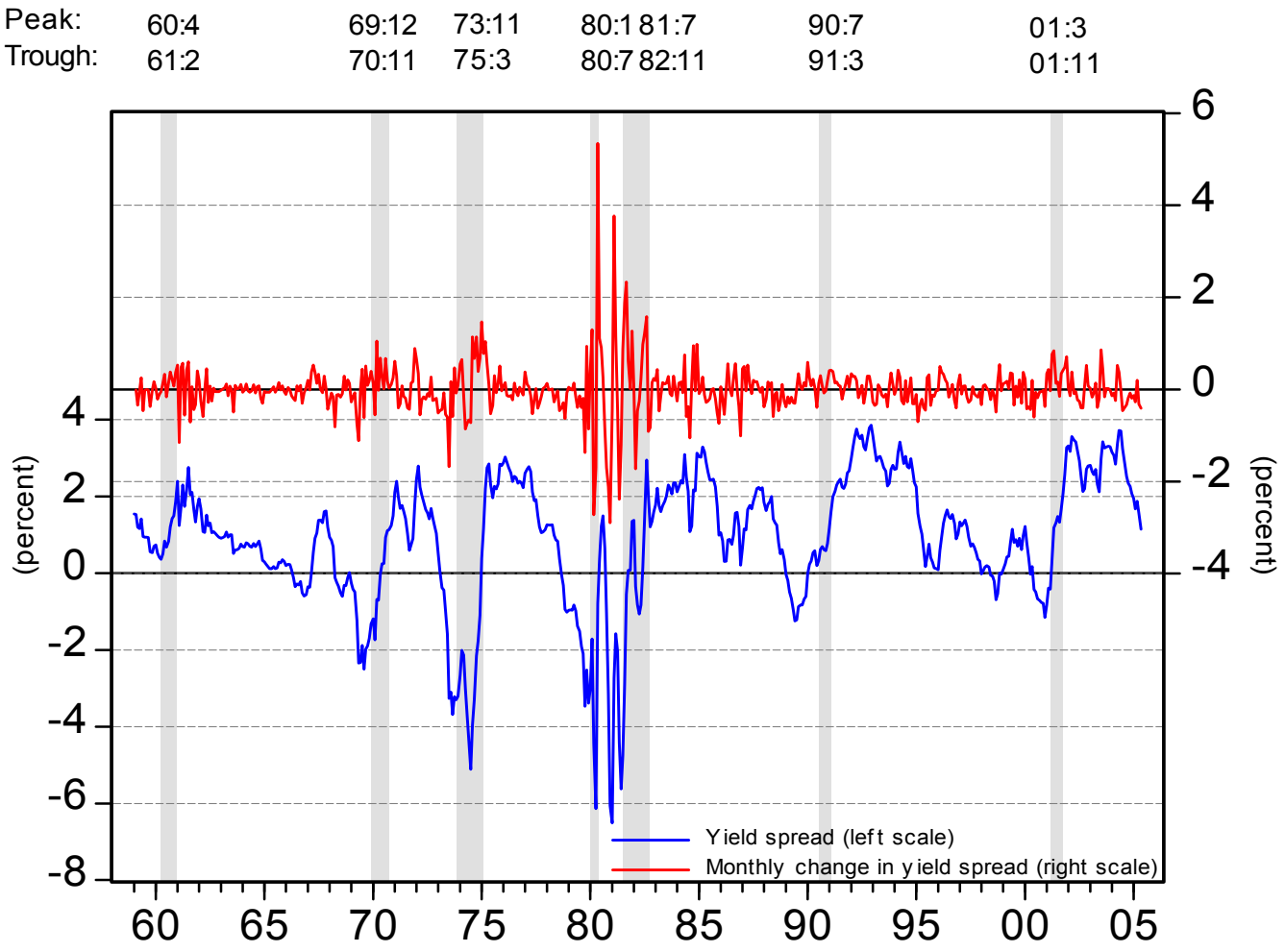

Chart 2

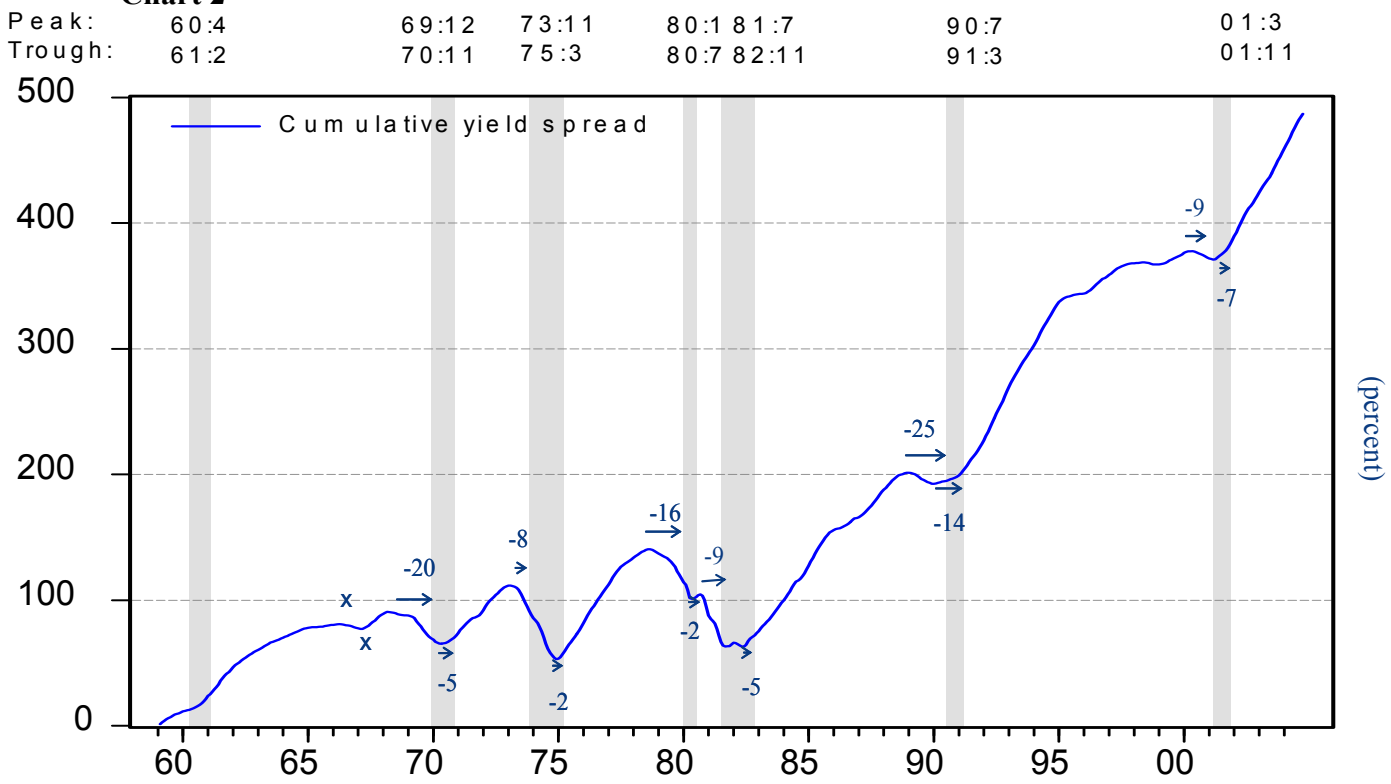

Table 1

Standardization Factors*: January 1984 to present (calculated over January 1984-December 2003)

Leading Index		Current	Revised
1	Average weekly hours, manufacturing	0.1965	0.2516
2	Average weekly initial claims for unemployment insurance	0.0252	0.0325
3	Manufacturers' new orders, consumer goods and materials	0.0588	0.0751
4	Vendor performance, slower deliveries diffusion index	0.0292	0.0700
5	Manufacturers' new orders, nondefense capital goods	0.0146	0.0189
6	Building permits, new private housing units	0.0202	0.0263
7	Stock prices, 500 common stocks	0.0291	0.0375
8	Money supply, M2	0.2774	0.3555
9	Interest rate spread, 10-year Treasury bonds less federal funds	0.3303	0.1030
10	Index of consumer expectations	0.0188	0.0297

* Official standardization factors will be available from The Conference Board web site after the July 21, 2005 release.

Chart 3a

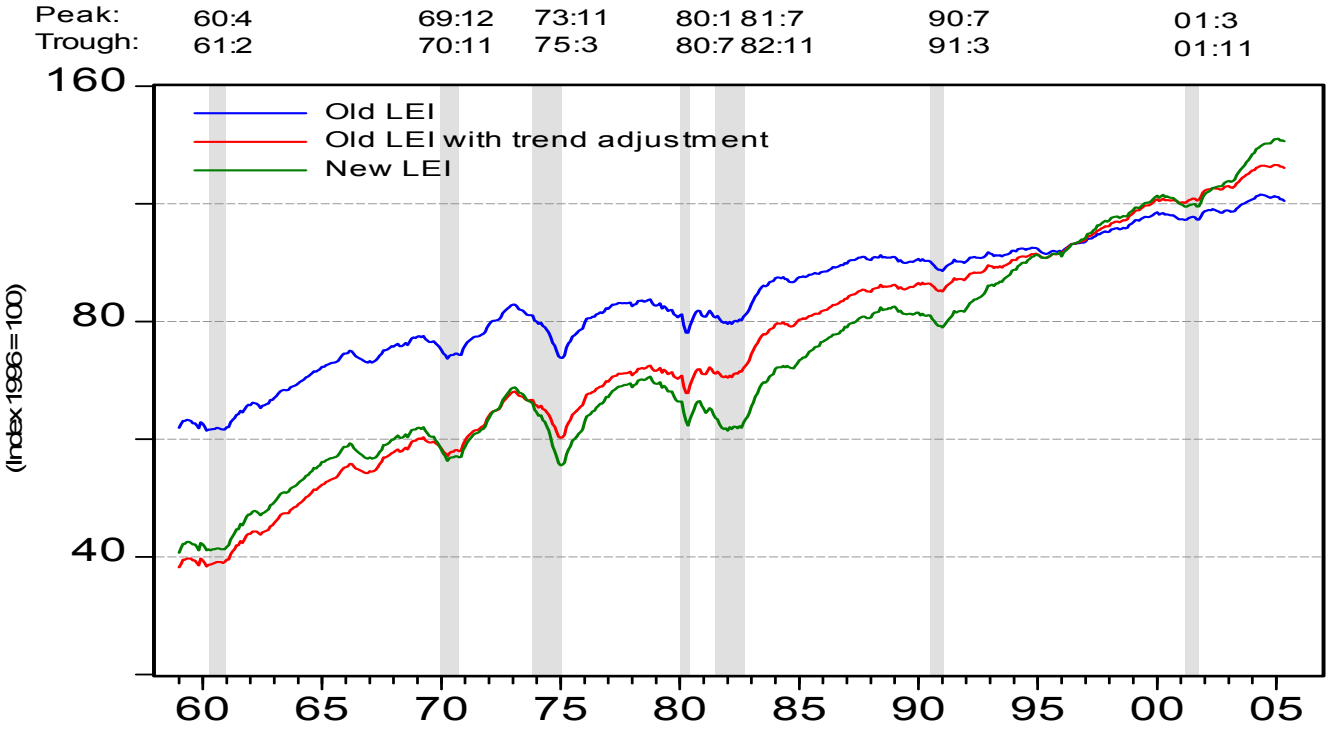

Chart 3b

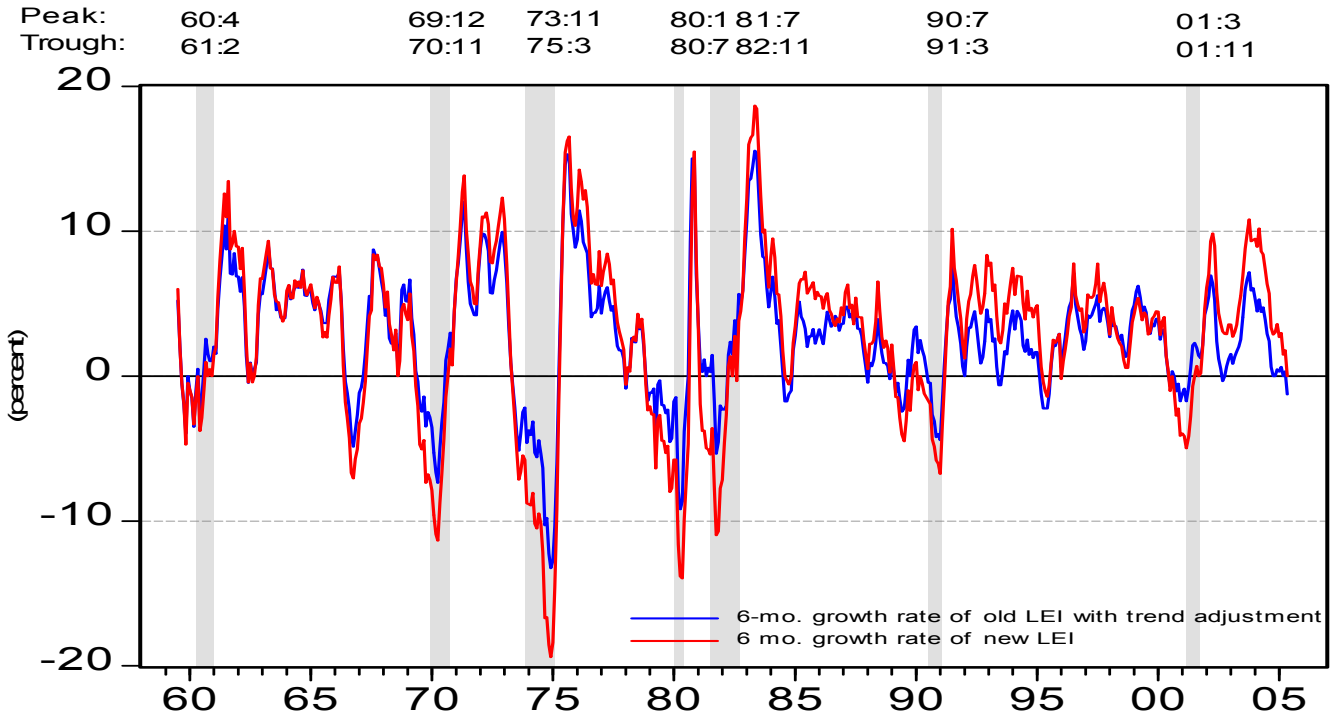

Table 2: Timing of Leading, Coincident, and Lagging Indexes

Business Cycle Peaks *	(1) Old LEI	(2) Old LEI with Trend Adjustment	(3) New LEI	(4) lead (-)/lag(+) CEI (unchanged)	(5) Lagging Index	(6) Lagging Index with Trend Adjustment
Apr-60	-11	-11	-11	0	3	9
Dec-69	-8	-8	-8	-2	3	3
Nov-73	-9	-9	-9	0	13	13
Jan-80	-15	-15	-15	0	3	3
Jul-81	-3	-3	-8	0	2	2
Jul-90	-6	-6	-18	-1	-12	6
Mar-01	-14	-11	-11	-6	-4	-4
MEAN	-9.43	-9.00	-11.43	-1.29	1.14	4.57
MEDIAN	-9	-9	-11	0	3	3
STDEV	4.28	3.87	3.78	2.21	7.65	5.44
EXTRA	3	1	1	0	1	1
MISSED	0	0	0	0	0	0

Business Cycle Troughs *	Old LEI	Old LEI with Trend Adjustment	New LEI	lead (-)/lag(+) CEI (unchanged)	Lagging Index	Lagging Index with Trend Adjustment
Feb-61	-11	-11	-11	0	9	5
Nov-70	-7	-7	-7	0	15	7
Mar-75	-1	-2	-2	1	17	9
Jul-80	-2	-3	-2	0	3	3
Nov-82	-8	-10	-10	1	6	6
Mar-91	-2	-2	-2	0	21	16
Nov-01	-8	-11	-7	17 **	28	6
MEAN	-5.57	-6.57	-5.86	2.71	14.14	7.43
MEDIAN	-7	-7	-7	0	15	6
STDEV	3.87	4.20	3.89	6.32	8.80	4.20
EXTRA	3	1	1	0	1	1
MISSED	0	0	0	0	0	0

Combined Statistics						
MEAN	-7.50	-7.79	-8.64	0.71	7.64	6.00
MEDIAN	-8	-8.5	-8.5	0	4.5	6
STDEV	4.40	4.08	4.68	5.00	10.40	4.90

Note: The Bry-Boschan algorithm was used to select turning points.

* Business cycle peaks and troughs are determined by the National Bureau of Economic Research

** For a discussion of the slow recovery period following the 2001 recession see "The U.S. Economy During and After the 2001 Recession: A Look at the Coincident Index, Real GDP, and Productivity " by McGuckin, Ozyildirim, and Zarnowitz in the February 2005 issue of the BCI report.

Chart 4a

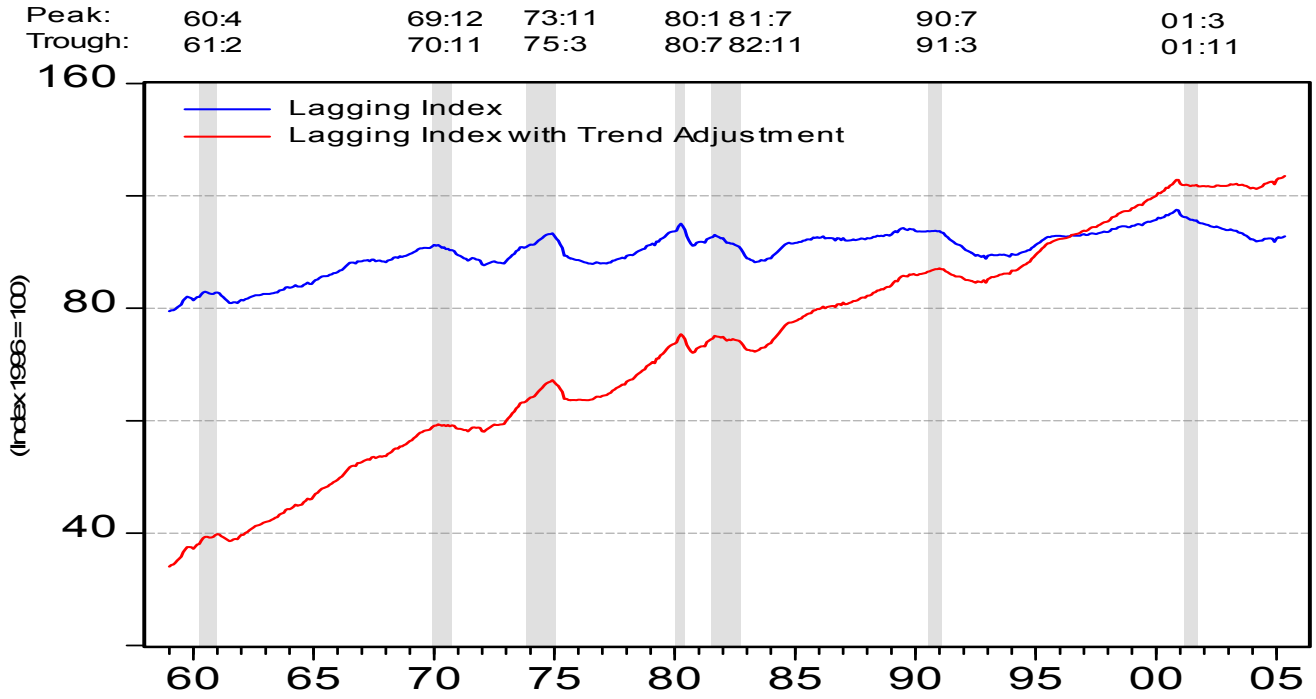
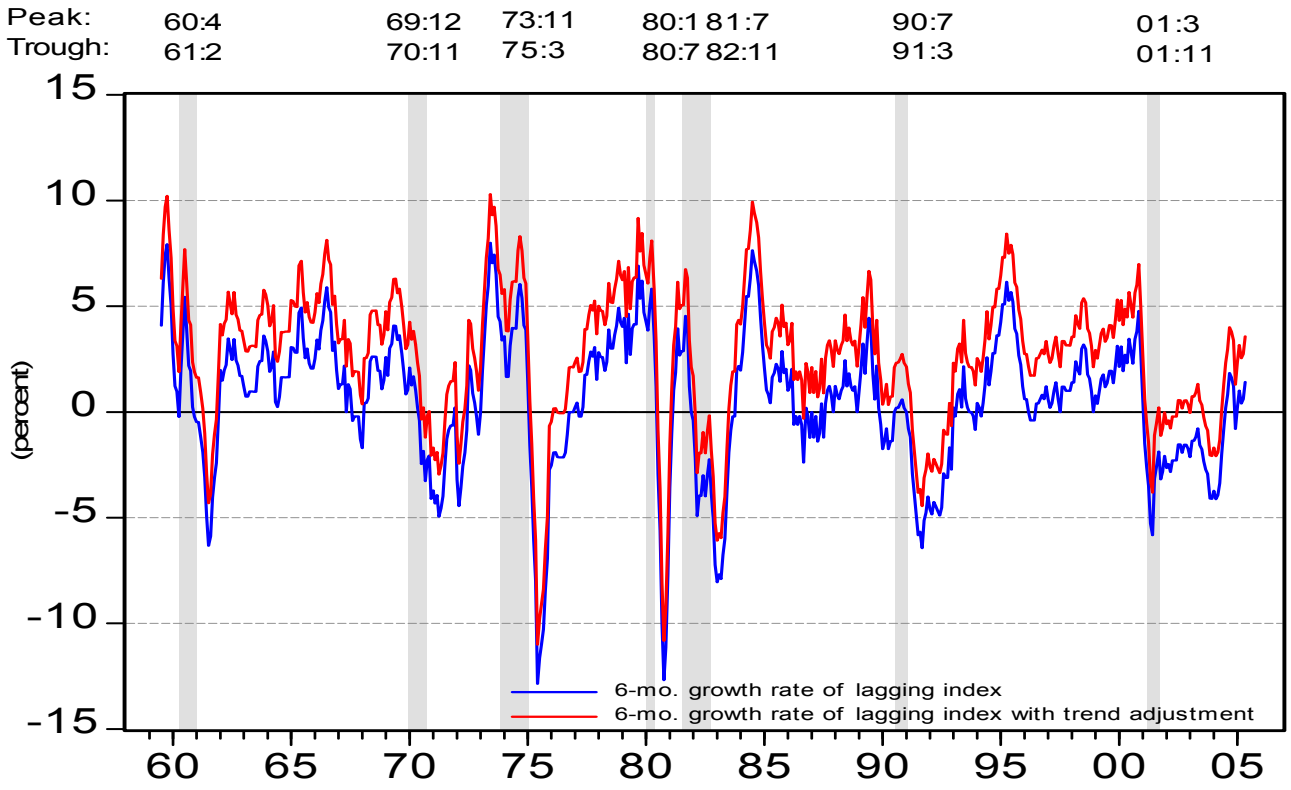
Chart 4b