

LEADING INDICATORS IN HISTORICAL PERSPECTIVE

Business cycle indicators are based on business cycle theory that focuses on substantially “uniform sequences in economic activity.” These sequences, ..., in turn, are revealed in statistical time series of the 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.

1. 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 for the U.S. economy. Here, only the components of the leading index shown in Table 1 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 W.C. Mitchell and A.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). 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 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

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Table 1. U.S. business cycle leading indicators short lists, 1938–1996

1996 Conference Board Leading Indicators ¹	1938 ²	1960 ³
1. Average Weekly Hours, Mfg.	1. Average Work Week	1. Same
2. Initial Claims for Unemployment Ins. (Inverted)	2. -----	2. Layoff Rate
3. Mfrs. New Orders, Consumer Goods and Materials, Constant Dollars	3. -----	3. Mfrs. New Orders, Durable Goods Industries ⁴
4. Vendor Performance Slower Deliveries, Diffusion Index	4. -----	4. -----
5. Mfrs. New Orders, Nondefense Capital Goods, Constant Dollars	5. Industrial Bldg. Contracts, floor space	5. Same (Construction Contracts Comm. & Ind. floor space)
6. Building Permits, New Private Housing Units	6. Residential Bldg. Contracts, floor space	6. Same (Housing Starts)
7. Index Stock Prices, 500 Common Stocks	7. Stock Price Index	7. Same
8. Money Supply, M2 (1982 Dollars)	8. -----	8. -----
9. Interest Rate Spread, 10-year Treasury Bonds less Federal Funds	9. -----	9. -----
10. Index of Consumer Expectations	10. -----	10. -----
	11. Liabilities Bus. Failures	11. A. Liabilities Bus. Failures B. Change in Bus. Pop.
	12. Index of Wholesale Prices	12. Same (Change in Index of Ind. Mat. Prices)
		13. Change in Bus. Inventories
	Plus: Passenger Car Prod. Tot. RR Op. Income Inner Tube Prod. Ton Miles Freight Hauled Truck Prod.	14. Corp. Profits (After Taxes)

¹The Conference Board, "The Cyclical Indicator Approach," *Business Cycle Indicators*, November 1996.

²Mitchell 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.

³Moore, "Leading and Confirming Indicators of General Business Changes," in *Business Cycle Indicators*, especially Table 2, pp. 56-77.

⁴Moore and Shiskin, *Indicators of Business Expansions and Contractions*, NBER Occasional Paper No. 103, 1962.

⁵Zarnowitz and Boshart, "Cyclical Indicators: An Evaluation and New Leading Indexes," *Business Conditions Digest*, May 1975. Reprinted in *Handbook of Cyclical Indicators*, Department of Commerce, 1975.

⁶Hertzberg and Beckman, "Business Cycle Indicators: Revised Composite Indexes," in *Business Conditions Digest*, January 1989, p. 98.

Table 1. U.S. business cycle leading indicators short lists, 1938-1996 (cont.)

1966 ¹	1975 ⁵	1989 ⁶
1. Same	1. Same	1. Same
2. Same (Limited Claims)	2. Same	2. Same
3. Same	3. Same (Consumer Goods and Materials, 1967 Dollars)	3. A. Same B. Change in Mfrs. Unfulfilled Orders, 1982 Dollars
4. -----	4. Vendor Performance, Slower Deliveries Index	4. Same
5. Same (Current Dollars)	5. Same (Contracts & Orders for Plant & Equipment, 1967 Dollars)	5. Same
6. Same (Index of New Bldg. Permits, Housing)	6. Same	6. Same
7. Same	7. Same	7. Same
8. -----	8. Same (M1, 1967 Dollars)	8. Same (1982 Dollars)
9. -----	9. -----	9. -----
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. Same (Index of Net Bus. Formation)	11. Same	11. -----
12. Same	12. Same (% Change in Sensitive Prices, WPI of Crude Materials, Excl. Foods and Feeds)	12. Same
13. Same (Change in Book Value, Mfg. & Trade Inventories)	13. Same (Change in Inventories on Hand and on Order, 1967 Dollars, Smoothed)	13. -----
14. Same	14. -----	14. -----
15. Ratio, Price to Unit Labor Cost, Mfg.		

²In addition to the lists shown, other changes were made in 1983 and 1987.

³Full 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.

⁴This series was added in 1950.

⁵In 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.

Source: National Bureau of Economic Research; The Conference Board.

reference date around which the revival centered." (Mitchell and Burns, 1938, cf. Moore, ed., 1961, p. 182).

The 1950 and 1960 lists were produced by G. 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 1 as series 1, 5, 6, 7, 11, and 12). Again, Moore echoed the cautions of Mitchell and Burns: "[T]he cautions (...) 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, 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 is still utilised. Table 1 shows that this list added the change in consumer instalment debt and the ratio of price to unit labour 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 V. Zarnowitz and Ch. 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 (reprinted in: BEA, 1977).

The sixth revision, in 1989, was conducted by M. P. Hertzberg and B. A. Beckman of the Bureau of Economic Analysis. It resulted in two additions and two deletions to the leading list (Hertzberg and Beckman, 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 1). But, there have been revisions as well. All of that raises the question of why the list has been subjected to such frequent revision. This important question shall be addressed next.

2. Why so many changes?

Since the "uniform sequences in economic activity" to which 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?

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 generalisations cover most changes to the lists of reliable leading indicators. But there are exceptions. For example, in 1975, the change in consumer instalment 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 (Klein, 1971).

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 behaviour 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, 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.” (TCB, *BCI*, July 1996, p. 4). Some of the additional volatility may have reflected cyclical behaviour in the 1980s (sometimes called “growth cycles”) that was less severe than in full blown “classical” 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.

3. 1996 indicators up close

Table 1 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 recognised 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 recognised 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 [which] reflected changing conditions in the labour 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 stabilising 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.

The third additional variable ..., 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.” (TCB, *BCI*, December 1996, p. 3).

4. Conclusions

1. 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.
2. The number of series deleted because the timing patterns had either changed or weakened is extremely small.
3. Occasionally, instead of improving, the quality of a given series deteriorates.
4. 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.
5. 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.

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