FRBSF Weekly Letter

April 26, 1985

Alternative Leading Economic Indicators

During the current economic expansion, real GNP grew at a strong 7.1 percent annual rate from the fourth quarter of 1982 through the second quarter of 1984. Then its growth slowed to a 3.2 percent rate during the second half of 1984, and to 1.3 percent in the first quarter of 1985 according to the preliminary estimate. Since the economy's capacity to produce tends to expand at about a 3 percent rate, some slowdown is to be expected in the growth of real GNP as an economic expansion continues, and a slowdown is desirable if the economy is to avoid a resurgence of inflation. But is the unusually low first quarter growth rate the prelude to a recession or simply part of a more abrupt transition than usual to the path of sustainable growth?

Worrisome is the fact that during the second half of 1984 the Commerce Department's index of leading economic indicators began to flash warning signals of a recession. The warnings given by this index in the past sometimes have proven false, indicating only a pause or temporary slowdown in the pace of an economic expansion. This *Weekly Letter* reviews the past frequency of such false signals by the Commerce Department's index and compares the reliability of that index to two alternative leading economic indicators. One of these is a leading indicator proposed in recent years by Professor Wallace Duncan of Northern Arizona University, while the other is traceable to a hypothesis about the business cycle first formulated more than seventy years ago by Wesley Mitchell, the father of modern business cycle research.

Commerce Department's leading index

The Commerce Department's index, based on years of painstaking research by economists associated with the National Bureau of Economic Research, is a composite index of 12 different economic variables chosen on the basis of their consistency in leading turning points in the business cycle. However, this leading indicator is by no means a fool-proof tool for forecasting. The month-to-month movements are somewhat erratic, the lead time of the index varies considerably, and the index sometimes gives false signals of a recession. The first problem is generally dealt with by applying a rule of thumb requiring three consecutive monthly downturns for the index to signal a recession. But even then, the lead time between a downturn in the index and a peak in the business cycle has varied from as little as three months to as much as 23 months during the post-World War II period.

Equally serious is the problem of false signals. From time to time, the Commerce Department's index has turned down for three consecutive months only to turn up again and reach a new and higher peak before the onset of a recession. All these episodes have been associated with a slowdown in the growth of real GNP, similar to that since the middle of 1984, rather than with actual recession, which is typically defined to be two or more consecutive quarters of decline in real GNP. The Commerce Department's index declined three or more consecutive months in 1951, 1962, and 1966, and shortly after each instance, the growth of real GNP slowed to 2.5 percent or less for at least two quarters. Also, there was a slowing in real growth after the index fell from July through September 1976, although subsequent revisions in the index showed that it had not declined after all.

As shown in the chart, in the current cycle the Commerce Department's index reached a high in May of 1984, declined through July, and then oscillated for several months. Although the rule of thumb of three consecutive monthly declines has not technically been met, it was not missed by much. Moreover, as of February of this year, the index was still one point below its May peak and had not as yet risen for three consecutive months. Because of the ambiguity of these signals, the index currently does not discriminate strongly between the occurrence of a growth recession and the development of a full-fledged recession.

Duncan leading indicator

Two alternative leading indicators are giving less ambiguous signals. One of these is the Duncan leading indicator based upon movements in the cyclical components of the GNP accounts. The primary cyclical components of the economy are generally recognized to be spending on consumer durables and gross private domestic investment.

The latter is comprised of business spending on plant and equipment (busines fixed investment), residential construction, and changes in business inventories.

The Duncan leading indicator is the ratio of consumer durables spending plus residential and business fixed investment to final sales, with all data adjusted for inflation. Final sales are defined as the gross national product less the change in business inventories. Thus, the indicator is the ratio of the cyclical components of expenditure to GNP, except that the change in business inventories has been subtracted from both the numerator and denominator.

Because the change in business inventories is erratic from quarter to quarter, it is extracted from the ratio to give the indicator a relatively smooth or uninterrupted trend throughout an economic expansion or contraction and thereby minimize false signals. Also, constructing the indicator in ratio form helps to increase its forecasting lead. For example, the ratio comprising the Duncan indicator turned down six quarters in advance of the 1981-82 recession, whereas the aggregate of the cyclical components turned down with only a one quarter lead.

The Duncan indicator generally has been somewhat more reliable than the Commerce Department's index in signaling business cycle peaks, but it too has given false signals. It signaled future recessions prematurely, as did the Commerce Department's index, by declining for at least one quarter in 1950, 1966, and 1978 before rising to new highs prior to the true business cycle peaks. However, the Duncan leading indicator did not give a false signal in 1962, as the Commerce Department's index did, and its false signals in 1950 and 1966 were associated with war-time expansions. Moreover, the false signal given by the Duncan indicator in 1978 occurred only one quarter prior to the actual peak in that indicator, which correctly signaled the 1980 recession.

Overall then, the Duncan index has been a somewhat more reliable leading indicator of business cycle peaks during peace-time than the Commerce Department's index, although the variability in its lead time—of between two and eight quarters—has not been significantly less. As shown in the chart, during the last half of 1984, the Duncan leading index slowed but did not turn down, contradicting the Commerce Department's index. Moreover, it was still rising in the first quarter of 1985 according to the preliminary estimate of the GNP. Thus, it constitutes an important piece of evidence suggesting that the current growth recession is not likely to snowball into a full-fledged recession.

Mitchell leading indicator

A third piece of evidence on the likelihood of a future recession comes from a leading indicator based upon a hypothesis about the nature of the business cycle first formulated by Wesley Mitchell who, along with Arthur Burns, pioneered the work of the National Bureau of Economic Research on cyclical indicators. Mitchell's hypothesis stresses the key role of the relationship of prices to unit costs in generating business cycles.

In the expansion phase of the business cycle, prices and costs both rise, but at first prices tend to rise faster than costs. While the prices of raw materials and some wholesale prices tend to rise faster than retail prices, the prices of labor lag far behind for a while. Also, overhead costs per unit of output fall as the volume of business increases. The result is that sometime after the trough in the business cycle, prices per unit of output begin to rise faster than costs and thereby increase profits per unit. This increase in profits, combined with a spreading of business optimism, leads to an expansion in capital investment. This expansion further swells the volume of business and, for a time, further contributes to a rise in prices relative to costs.

Sometime prior to the cyclical peak in the business expansion, however, the decline in overhead costs per unit ceases as capacity utilization improves. The expiration of old contracts forces renewals at the higher rates of interest, rent, and salaries prevailing in prosperity. Meanwhile, variable costs rise at a relatively rapid rate. The price of labor rises not only because standard wages go up, but also because pay for overtime is higher; and the efficiency of labor declines as more relatively unskilled workers are hired. Also, the rate of increase in prices relative to costs is moderated by additions to industrial capacity and the limits put on the growth of demand by higher interest rates. The result is that sometime prior to the cyclical peak in business activity, costs per unit begin to rise faster than unit prices.

The economic statistics bearing on this hypothesis confirm its validity. Moreover, the switch from a situation in which prices are rising faster than unit costs to one in which costs are rising faster can serve as a useful leading indicator of the peak in the business cycle. As is true of the other leading indicators, however, the Mitchell indicator is not completely free from false signals; and its lead time is also highly variable—at between zero and 13 quarters.

The Mitchell indicator gave false signals of recession in 1962, and again in the post-1975 expansion when it performed very poorly because of the unusually weak productivity growth in the period. But while the Mitchell indicator has given some false signals of recession in the past, it is not currently flashing a warning. The chart plots the Mitchell indicator as the percent change in unit costs of nonfinancial corporations less the percent change in prices, both measured from four quarters earlier. Through the fourth quarter of 1984, unit costs continued to rise more slowly than prices, suggesting that the momentum of the current expansion has not as yet weakened significantly.

Conclusion

The warning signal currently being given by the Commerce Department's leading index appears to be similar to those occurring in the past that have indicated only a pause in economic growth. Neither of the alternative leading economic indicators is as yet pointing to the likelihood of an imminent recession. Also, the unusually weak growth of real GNP in the first quarter appears to be the result of several temporary factors, rather than a prelude to recession.

A reversal of the fourth quarter's temporary surge in net exports subtracted over three percentage points from the growth rate of real GNP in the first quarter. Although further deterioration in the trade balance is expected this year due to the stronger dollar, this should occur at only half the first quarter's pace. In addition, recent data on housing starts, new orders for durable goods, and planned investment all point to stronger residential and business fixed investment in the second quarter. Housing starts advanced 12 percent in the first quarter, and planned investment is holding up well in spite of increased foreign competition. In fact, many of the industries that have been hardest hit by imports are ones that are increasing their investment the most. Thus, the spur to domestic investment to cut costs that has arisen from foreign competition appears to be at least as important as reductions in investment spending due to lower capacity utilization in manufacturing.

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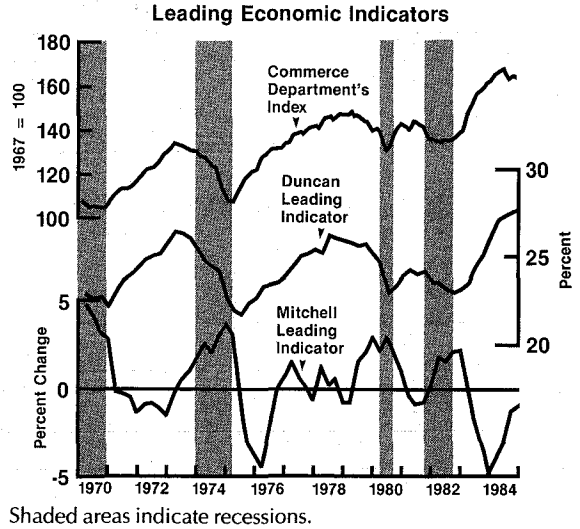

Shaded areas indicate recessions.

Research Department
Federal Reserve
Bank of
San Francisco

Alaska Arizona California Hawaii Idaho
Nevada Oregon Utah Washington

BANKING DATA—TWELFTH FEDERAL RESERVE DISTRICT

(Dollar amounts in millions)

Selected Assets and Liabilities Large Commercial Banks	Amount Outstanding 04/10/85	Change from 04/03/85	Change from 04/11/84 Dollar	Change from 04/11/84 Percent[7]
Loans, Leases and Investments[1] [2]	190,029	− 254	12,723	7.1
Loans and Leases[1] [6]	172,150	− 151	14,517	9.2
Commercial and Industrial	52,554	− 322	4,847	10.1
Real estate	62,700	112	2,799	4.6
Loans to Individuals	33,328	46	6,008	21.9
Leases	5,362	3	355	7.0
U.S. Treasury and Agency Securities[2]	10,996	− 114	− 1,266	− 10.3
Other Securities[2]	6,884	12	− 527	− 7.1
Total Deposits	197,005	− 899	7,238	3.8
Demand Deposits	46,631	− 770	90	0.1
Demand Deposits Adjusted[3]	31,251	373	84	0.3
Other Transaction Balances[4]	14,141	25	1,209	9.3
Total Non-Transaction Balances[6]	136,233	− 154	5,938	4.5
Money Market Deposit Accounts—Total	44,057	30	3,419	8.4
Time Deposits in Amounts of $100,000 or more	38,746	− 194	724	1.9
Other Liabilities for Borrowed Money[5]	20,905	791	2,894	16.0

Two Week Averages of Daily Figures	Period ended 04/08/85	Period ended 03/25/85
Reserve Position, All Reporting Banks		
Excess Reserves (+)/Deficiency (−)	− 32	67
Borrowings	123	36
Net free reserves (+)/Net borrowed(−)	− 155	31

1 Includes loss reserves, unearned income, excludes interbank loans
2 Excludes trading account securities
3 Excludes U.S. government and depository institution deposits and cash items
4 ATS, NOW, Super NOW and savings accounts with telephone transfers
5 Includes borrowing via FRB, TT&L notes, Fed Funds, RPs and other sources
6 Includes items not shown separately
7 Annualized percent change