Is a Recession Inevitable This Year?

By Bryon Higgins

Predictions of a recession in 1988 began surfacing even before the stock market crash last fall. As the length of the economic expansion approached five years, the longest in peacetime U.S. history, some commentators suggested that prospects for further expansion were dimming. The economy was "running out of steam," it was said, as a natural consequence of a prolonged period of uninterrupted growth. Another often-cited factor pointing to a recession was restrictive monetary policy. As monetary growth slowed and interest rates rose during much of the year, some analysts claimed that a sustained period of tight money would lead inevitably to a recession.

The stock market crash last October intensified concern about a recession. Some thought the resulting reduction in consumer wealth and in the confidence of both individuals and businesses guaranteed an economic downturn. So sure of this outcome were some that they even dated the beginning of the recession before there were any data suggesting a weak economy. For example, by early November one economic consultant claimed that "the U.S. economy entered a business recession on October 20, 1987, one day after the sharp plunge in world stock values."[1]

This article argues that a recession this year is not inevitable. The first section shows that economic expansions need not end merely because they have lasted a long time. The second section demonstrates that there is no decisive evidence that monetary restraint was as severe last year as the restraint associated with recessions in the past. And the final section shows that the stock market is too unreliable an indicator to be counted on, without supporting evidence, to forecast the course of the economy.

Is the economic expansion about to die of old age?

The economic expansion that began in December 1982 is now the longest in peacetime U.S. history. The idea that such long expansions

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[1] Vincent J. Malanga as quoted in an article entitled "After the Crash: Hazardous Forecasting," *Wall Street Journal*, November 9, 1987.

just fade away is based in part on traditional business cycle theories, which rely on analysis of the internal dynamics of a modern market economy, and in part on historical experience before World War II. But the postwar experience is not entirely consistent with the view that economic expansions have a fixed life span. Moreover, recent research on business cycles indicates that postwar economic expansions have been caused by financial or real shocks to the economy rather than by the internal dynamics of the economy itself.

Traditional business cycle theories

Business cycles before World War II were fairly predictable. The 20 U.S. economic expansions from 1854 to 1933 lasted an average of 25 months, and the corresponding recessions lasted an average of 22 months. Most expansions and recessions during that period were close to the average. Except for wartime buildups, almost 90 percent of expansions lasted one and a half to three years. And about 70 percent of the recessions lasted one to two years. This experience gave rise to the belief that the business cycle was regular—perhaps even periodic—with a recession of a little less than two years typically followed by an expansion of about two years.

The apparent periodic timing of ups and downs in economic activity led economists to develop theories to explain this regularity.[2] Although the theories differed widely in detail and emphasis, all early business cycle theories assumed that the internal dynamics of a market economy led inevitably to regular fluctuations in the levels of output and prices. Most stressed the excesses and imbalances that were thought to develop after prolonged periods of economic growth. For example, after a sustained period of business expansion, wages and other production costs might increase faster than selling prices, leading to a squeeze on profits and a cutback on business investment, particularly in industries where there had been overinvestment. The interactions among financial and real variables were thus believed to lead inevitably to a recession after a more or less fixed period of economic expansion. Because the theories were developed to explain economic fluctuations during the gold standard era, they often assigned a critical role to financial factors, such as liquidity shortages and rising interest rates, that typically preceded downturns in economic activity. So closely linked were financial crises and declines in the real economy that economic slumps were commonly referred to as panics, reflecting the coincidence of financial turmoil and slumps in business activity under the gold standard.

These business cycle theories implying a fixed limit on the length of economic upturns relied mainly on the internal dynamics of a market economy. Supply shocks, such as the oil price increases so prominent in the 1970s, were generally thought to play little if any role. Nor were mistaken government policies considered a culprit. To a large extent, the lack of emphasis on economic policy reflected historical circumstances. As Arthur Burns emphasized in his presidential address to the American Economic Association in 1959, the scope of the government's economic involvement was too small in the pre-World War II period for government policy to play a major role in economic fluctuations.[3] Fiscal policy was not important because government spending and taxes were small relative to total output. Monetary policy as cur-

[2] Much of the discussion of endogenous business cycle theories is based on Victor Zarnowitz, "Recent Work on Business Cycles in Historical Perspective," *Journal of Economic Literature*, June 1985.

[3] Arthur F. Burns, "Progress Towards Economic Stability," *American Economic Review*, March 1960.

rently understood did not exist because monetary and credit conditions were determined primarily by the workings of the gold standard until the Federal Reserve was established in 1914. Indeed, avoiding recurrent financial panics such as those in the 19th and early 20th centuries was the primary reason for creating a central bank that could "furnish an elastic currency" and for providing federal deposit insurance, both of which are mechanisms for keeping the internal dynamics of the economy from aborting economic expansion.

Challenges to the traditional theories

The postwar evidence is not consistent with traditional business cycle theories. The timing of business cycles, for example, has become much less predictable in the postwar period. Recessions have averaged only one year, about half as long as in the prewar period, and expansions have averaged almost four years, about twice as long as before. Economic expansions have also become more variable in length, ranging from the 12-month expansion in 1980-81 to the 106-month expansion in the 1960s. So an economic expansion lasting more than five years is no longer so unusual that a recession should be considered imminent merely because the economic expansion has continued for a long time.

Moreover, recent studies suggest that economic expansions do not simply die of old age. A study by Neftci found that more severe recessions tend to be followed by larger cumulative increases in output.[4] Given the severity of the 1981-82 recession, the current expansion would thus be expected to last longer than average, especially since economic growth in recent years has been moderate. Moreover, a recent study by Diebold and Rudebusch found no evidence that the probability of a recession rises as the length of an economic expansion increases.[5]

Empirical studies imply that postwar recessions have typically been caused by the combined effects of two or more external shocks rather than from the internal dynamics of the economy. Two recent empirical studies confirmed this "cumulative effect" hypothesis.[6] One study used simulations of a large econometric model, and the other used estimates from a simple four-equation model of the economy. Both conclude that postwar recessions have typically been caused by two or more shocks. The mid-1970s recession, for example, was found to have been associated with both the OPEC price increase and at least one other disturbance. Monetary policy was important sometimes but not always. Similarly, fiscal policy, oil shocks, major strikes, and unexpected changes in some component of aggregate spending have been important in causing some but not all postwar recessions.

These studies cast doubt on the view that the prospects for a recession increase with the length of an economic expansion. To the extent that recessions are now brought on by external shocks rather than internal mechanisms, there is little reason to expect an economic expansion to end merely because it has already lasted a long time. Instead, the timing of recessions depends on when

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4 Salih H. Neftci, "Is There a Cyclical Time Unit?" in *The National Bureau Method, International Capital Mobility, and Other Essays,* Carnegie-Rochester Conference Series on Public Policy, vol. 24, North-Holland, Spring 1986.

5 Francis X. Diebold and Glenn D. Rudebusch, "Does the Business Cycle Have Duration Memory?" Special Studies Working Paper #223, Board of Governors of the Federal Reserve System, August 1987.

6 Otto Eckstein and Allen Sinai, "The Mechanisms of the Business Cycle in the Postwar Era," and Olivier J. Blanchard and Mark W. Watson, "Are Business Cycles All Alike?" in *The American Business Cycle,* Robert J. Gordon, ed., University of Chicago Press for the National Bureau of Economic Research, 1986.

two major external disturbances to the economy happen to coincide. The growing importance of government policies has stimulated research into whether economic policies, contrary to the intent, have been a source of such disturbances. Much of this research has focused on monetary policy, with some economists arguing that recessions are due primarily to declines in monetary growth associated with restrictive monetary policy.

Has monetary restraint made a recession inevitable?

The Federal Reserve followed a less accommodative monetary policy during much of 1987. Some thought the resulting reduction in monetary growth and rise in interest rates made a recession likely if not inevitable. But the evidence is mixed. Although the slowdown in monetary growth by itself might seem to justify the conclusion, the accompanying behavior of interest rates was not typical of the behavior that has usually preceded a recession.

Historical relation between monetary growth and recessions

The relationship between monetary growth and business cycles was documented by Milton Friedman and Anna Schwartz.[7] Extensive investigation of historical evidence in the United States, together with theoretical considerations, led Friedman and Schwartz to conclude that:

> Appreciable changes in the rate of growth of the money stock are a necessary and sufficient condition for appreciable changes in the rate of growth of money income.[8]

The implication is that an appreciable slowdown in monetary growth is inevitably followed by a recession.

Evidence shows that postwar recessions have usually been associated with a deceleration in monetary growth. This relationship is shown in Charts 1 and 2 for the period since 1952.[9] Chart 1 shows the extent to which growth in both nominal and real, or inflation-adjusted, M1 has accelerated or decelerated from a longer term trend. Chart 2 shows comparable data for the broader monetary measure, M2. The data are expressed as the ratio of the actual money stock to the level that would have been reached if monetary growth the year before had continued at the rate established over the previous two years. A ratio above one indicates that monetary growth accelerated over the preceding 12 months, and a ratio below one indicates that monetary growth decelerated.

The charts show that each of the recessions between 1952 and 1981 was associated with an appreciable decline in monetary growth. All four measures of monetary growth typically began to decline a few quarters before the onset of a recession, before accelerating just before or just after the peak in economic activity. But the 1981-82 recession was different in two respects. Although M1 growth declined, the decline did not begin until after the recession started. And M2 growth did not decelerate appreciably either before or during the recession. One possible explanation for this anomalous behavior is that deregulation of deposit ceiling rates and the introduction of such new accounts as MMDA's and Super NOW's temporarily distorted monetary growth rates.

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[7] Milton Friedman and Anna Jacobson Schwartz, *A Monetary History of the United States: 1867 to 1960,* Princeton University Press for the National Bureau of Economic Research; and "Money and Business Cycles," *Review of Economics and Statistics,* February 1963.

[8] "Money and Business Cycles," p. 53.

[9] A more detailed description of the methodology used to construct these charts, as well as the theoretical rationales, can be found in Bryon Higgins, "Monetary Growth and Business Cycles," *Economic Review,* Federal Reserve Bank of Kansas City, April 1979.

CHART 1

Monetary deceleration and recessions

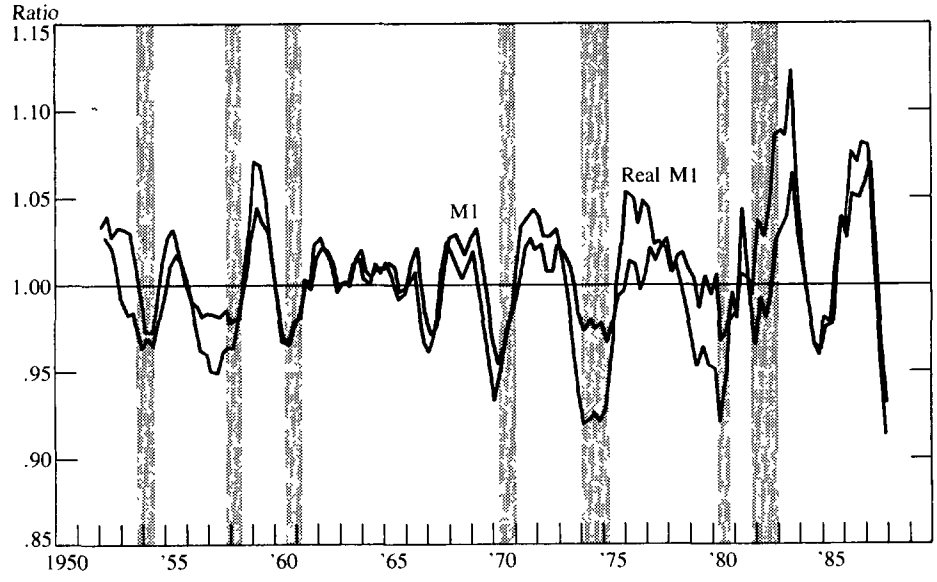
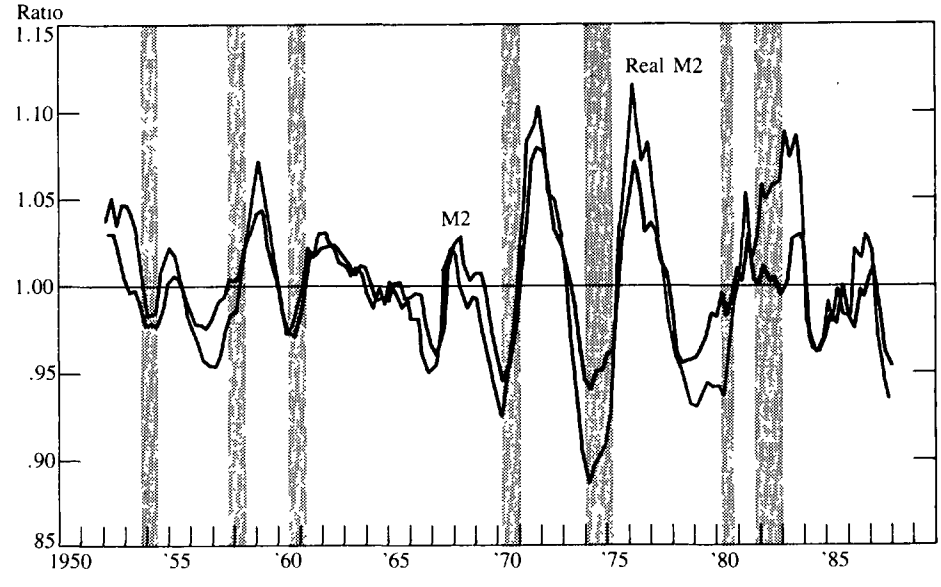


CHART 2

Monetary deceleration and recessions



The charts also show that some monetary decelerations are not followed by recessions. All measures of monetary growth dropped sharply in 1966-67, but though economic growth slowed, there was no recession. For that reason, it is useful to distinguish between the degree of monetary deceleration always followed by a recession and the degree that is only sometimes followed by a recession. This distinction can be made by classifying all declines in monetary growth greater than the decline in 1966-67 as severe rather than merely appreciable. By this criterion, all severe monetary decelerations in the postwar period have been associated with a recession.

The decline in monetary growth last year falls into the severe category. All measures of monetary deceleration fell well below those reached in 1966-67 to levels among the lowest in the postwar period. By the fourth quarter of 1987, growth of M1 had declined 6.5 percentage points below its trend growth rate in 1985-86, and growth of M2 had declined 4.25 percentage points below its trend. The deceleration was even more pronounced in the inflation-adjusted measures: real M1 growth fell 8.25 percentage points below its trend, and real M2 growth fell 6.0 percentage points below its trend. The severity of the monetary deceleration last year thus seems to imply that a recession is imminent.

But the atypical experience in the last recession raises doubt about the reliability of past relationships between monetary growth and business cycles. The failure of M1 growth to decline before the recession began and the failure of M2 growth to decline at all may indicate that financial innovation and deregulation have fundamentally changed the cyclical behavior of monetary growth. There is abundant evidence, for example, that the interest sensitivity of the demand for money has increased as a result of removing ceiling interest rates on most deposits.[10] Variations in interest rates may thus have exaggerated the degree of monetary deceleration last year. Declining interest rates beginning in late 1984 led to very rapid monetary growth in 1985 and 1986. As oil prices rebounded and the Federal Reserve snugged monetary policy last year, interest rates rose and monetary growth fell. The swings in monetary growth in recent years have been much wider than would previously have been associated with such interest rate movements because of the increased interest sensitivity of money demand. Since monetary growth was particularly elevated in 1985-86 and was particularly depressed in 1987 by interest rate developments, the deceleration of monetary growth in 1987 was doubly exaggerated. For that reason, comparing the degree of monetary deceleration last year to the degree before the deregulation of deposit rates may give a misleading impression of the severity of its impact on the economy.

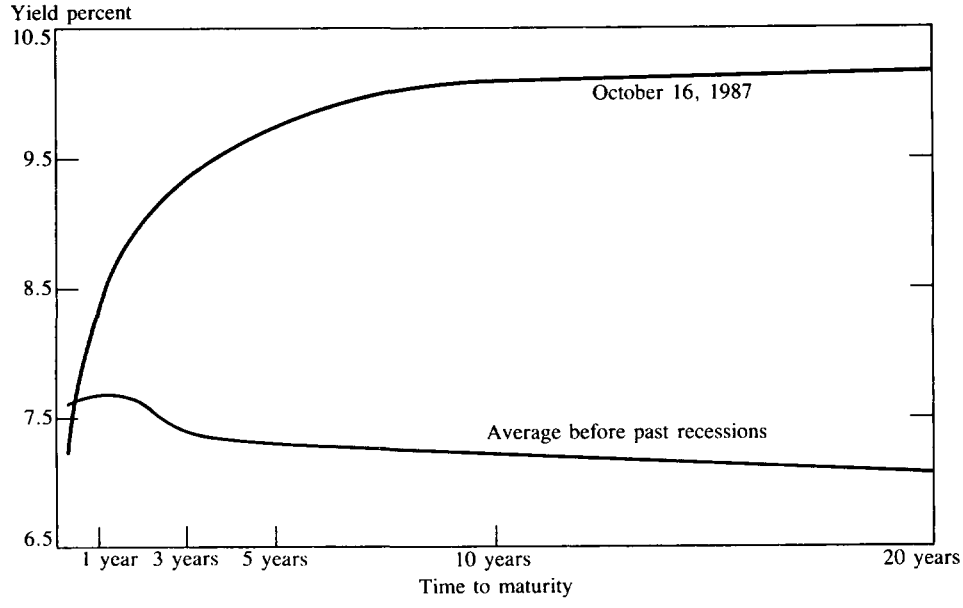
An alternative measure of monetary restraint

Moreover, the shape of the yield curve does not confirm that monetary restraint was severe last year.[11] The yield curve shows the relationship between the yields on financial assets and their terms to maturity. It is normally upward sloping because investors require a premium to hold less liquid and riskier long-term assets. But when the demand for money and credit rises faster than the supply, short-term interest rates rise

[10] See, for example, Richard D. Porter, Paul A. Spindt, and David E. Lindsey, "Econometric Modeling of the Demands for the U.S. Monetary Aggregates: Conventional and Experimental Approaches," presented at the Pacific Basin Central Bank Conference on Economic Modeling, Reserve Bank of Australia, Sydney, Australia, December 1-4, 1986.

[11] Some business economists argue that the slope of the yield curve is very reliable as an indicator of the degree of monetary restraint. See, for example, Robert T. McGee, "Stock Market Decline Paves Way to Longer Expansion," *Financial Comment*, Irving Trust, November 1987.

CHART 3
Yield curves as a measure of monetary restraint



much more sharply than long-term rates. As a result, the yield curve can slope downward (or become inverted) for a while. These conditions often occur during the latter stage of an economic expansion, causing some to consider an inverted yield curve to be a precursor of a recession.

The yield curve has typically become inverted before postwar recessions. Inverted yield curves have preceded five of the seven recessions since 1952. In one of the cases in which a recession was not preceded by an inverted yield curve, the upward slope of the yield curve became less pronounced, even though short-term interest rates did not exceed long-term rates. Changes in the slope of the yield curve have thus been a fairly reliable monetary indicator of an impending recession, as is demonstrated in Chart 3. The chart shows the average yield curve in the month preceding the onset of postwar recessions. The yield curve inverted immediately before the onset of a recession, as short-term interest rates have exceeded long-term rates.

In contrast, the shape of the yield curve did not signal the onset of a recession last year. Immediately before the stock market crash, when some thought monetary restraint was most severe, long-term interest rates far exceeded short-term rates, the opposite of what experience suggests would prevail if financial conditions were signaling an imminent recession. Indeed, the yield curve became much steeper throughout 1987 as the rise in long-term interest rates significantly outpaced the rise in short-term rates.

One explanation for the behavior of interest rates last year is that weakness of the dollar was responsible for much of the rise in interest rates. Declines in the foreign exchange value of the dollar can raise interest rates for two reasons. Weakness of the dollar raises import prices and can thus raise expectations of inflation, thereby

increasing the inflation premium in interest rates. In addition, dollar weakness causes losses on foreigners' holdings of U.S. securities. If these losses lead to reluctance by foreigners to buy dollar-denominated securities, U.S. interest rates must rise enough to overcome this reluctance. Some analysts argued that both effects of dollar weakness contributed to last year's rise in interest rates, especially long-term rates.[12] The weakness of the dollar can thus help explain why the yield curve steepened in contrast to what typically happens when interest rates rise primarily because of restrictive monetary policy.

On balance, therefore, evidence on the degree of monetary restraint is mixed. Monetary growth declined more than at any other time in the past 35 years, but the decline may have resulted largely from a heightened response to the previous fall in interest rates. Moreover, the yield curve did not become inverted as it did before most recessions in the postwar period. Perhaps reflecting the conflicting signals regarding the extent of monetary restraint, few economists were predicting a near-term recession before October 19.

Does the stock market crash ensure a recession?

The sharp decline in stock prices on "Black Monday" brought more predictions of a recession. By November, 35 percent of the economic forecasters surveyed by the Blue Chip newsletter predicted a recession had already started or would start in 1988, up from only 8 percent in September.[13] The decline in stock prices, it was reasoned, would reduce consumption and investment spending enough to halt the economic expansion. Many press accounts hailed the stock market as a reliable guide to the future course of the economy. But the record does not warrant such confidence in a reliable relationship between stock prices and the economy.

Why the stock market may foreshadow economic developments

Stock prices are classified as a leading indicator of the business cycle. The Standard and Poor's Index of 500 common stock prices, for example, is included in the Commerce Department's index of leading indicators. Based on research conducted for the National Bureau of Economic Research, the components of the index of leading indicators are chosen for their consistency of timing and conformance with economic cycles. Some consider stock prices among the most reliable indicators of future economic activity.

One reason stock prices may be a good leading indicator is that the stock market is a "barometer" of economic developments.[14] Even if stock prices have no direct effects on the economy, they may be an accurate leading indicator if they reflect and summarize information on the fundamental determinants of economic activity. Stock prices are generally thought to be determined in the long run by the discounted value of expected future business profits. Stock prices would thus fall immediately if estimates of future profits are lowered due, for example, to the belief that an economic slump is imminent. If such beliefs were borne out, the stock market decline would accurately predict a recession even if stock prices had

[12] The most comprehensive statement of the link between a weak dollar and U.S. interest rates is in Stephen Marris, *Deficits and the Dollar—Revisited*, Institute for International Economics, August 1987.

[13] *Blue Chip Economic Forecasts*, Robert J. Eggert, publisher, September and November 1987.

[14] The discussion in this section is based in part on Douglas K. Pearce, "Stock Prices and the Economy," *Economic Review*, Federal Reserve Bank of Kansas City, November 1983. See also Stanley Fischer and Robert C. Merton, "Macroeconomics and Finance: The Role of the Stock Market," Carnegie-Rochester Conference Series on Public Policy, vol. 21, Autumn 1984.

no part in causing the recession. Similarly, a rise in interest rates would lead to an immediate fall in the present value of future earnings and thus in stock prices. So if interest rates increase enough to cause a recession, stock prices would turn down before economic activity and would thus be judged an accurate leading indicator. Or finally, a general decline in optimism about prospective economic developments might lead to lower stock prices before affecting spending, production, and employment. In all of these cases, a decline in stock prices could reliably foreshadow a recession without itself contributing to the economic forces causing the recession.

The more common reason for thinking the stock market is a good leading indicator is that stock prices influence consumption and perhaps investment spending. The effect on consumer spending is thought to result mainly from changes in consumer wealth caused by stock market fluctuations. According to the life-cycle model of consumption, a reduction in consumers' net worth would lead households to lower planned consumption in each period of their planning horizon. So the $750 billion loss in wealth resulting from the stock market plunge last October would be expected to cause consumers to cut back on spending substantially in 1988. According to this view, the trebling of stock prices from July 1982 to October of last year was important for reducing the saving rate to historic lows and for the corresponding strength of consumption spending that has driven the economic expansion. But the recent decline in stock prices would reverse this trend, causing households to cut back sharply on spending.

One objection to this scenario is that most households do not directly own stocks. According to a survey of household assets, equity ownership is heavily skewed toward high income, wealthy households. The wealthiest 2 percent of households account for 53 percent of all the stock directly owned by individuals, and the wealthiest 21 percent of households account for 91 percent.[15] Only about 25 percent of households own stock directly or in mutual funds. With stock holdings so heavily concentrated, some argue that the primary effect of a stock market decline will be limited to a decline in purchases of luxury goods. Because relatively few households suffer a significant reduction in wealth, the wealth effect of a stock market decline may be limited.

Even so, stock market declines may have a broader effect on consumption through their effect on consumer confidence. According to some studies, consumers spend more when they are confident about the future health of the economy and about their own financial security. A decline in stock prices, especially when as abrupt as that last October, can reduce consumer confidence and thus cause even those households without a direct stake in the stock market to reduce spending. Indeed, a poll taken by the *Los Angeles Times* soon after the stock market crash indicated that individuals who did not own stock intended to cut back spending more than those who did own stock.[16] Because of its effect on consumer confidence, therefore, a decline in stock prices can reduce consumer spending for a broad range of goods and services.

Empirical studies confirm that consumption spending is directly related to stock prices. Most studies find that consumption spending declines 3 to 7 percent as much as the decline in stock prices, with the effect spread over several quarters.[17] One study of the recent stock market decline found that aggregate consumption spending would be directly lowered about $3 billion

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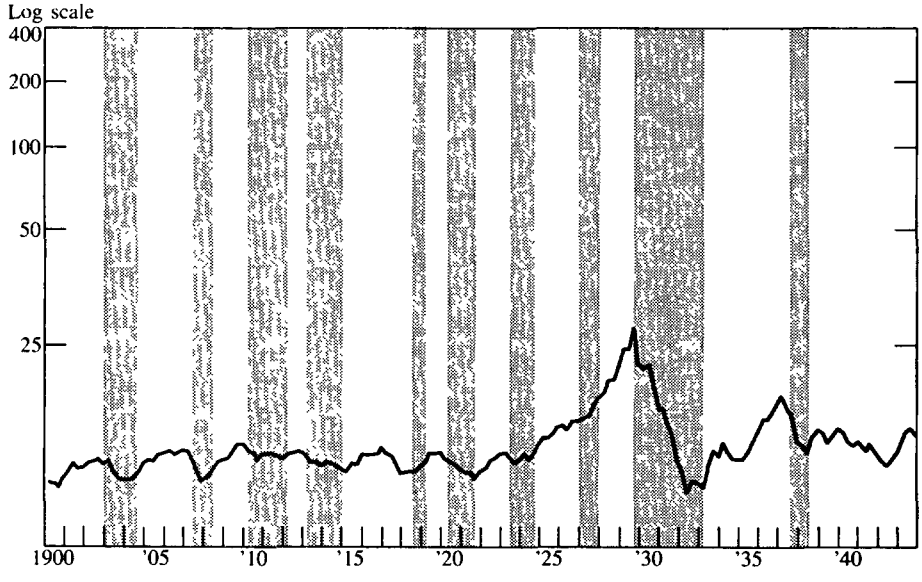
15 These data are from the Census Bureau's 1984 *Survey of Income and Program Participation.*

16 *Los Angeles Times*, November 4, 1987.

17 See Pearce, "Stock Prices and the Economy," p. 16.

CHART 4
Stock prices and recessions



in the fourth quarter of 1987 and another $27 billion in 1988.[18] The indirect multiplier effects could lower consumption about the same amount. Other things equal, the total reduction in consumer spending caused by the stock market plunge could reduce economic growth more than one percentage point in 1988, according to these estimates.

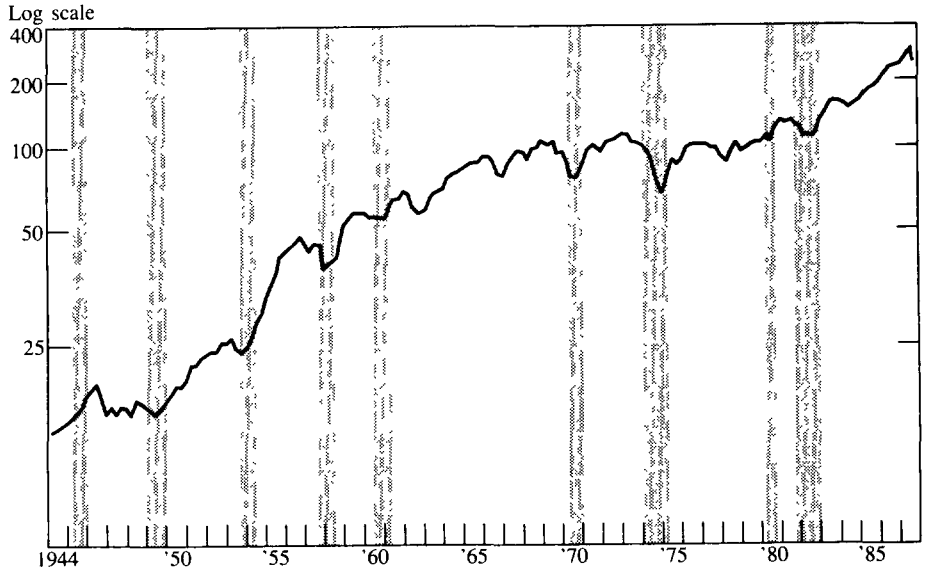
The stock market decline could also reduce economic growth by lowering business investment. Major theories of business investment suggest that investment spending is positively related to stock prices.[19] A decline in stock prices, for example, increases the cost for business of raising equity capital, thus discouraging business fixed investment. Moreover, investment decisions depend on the confidence of businesses in the overall state of the economy. So an expectation

[18] Charles Lieberman, "Estimates of the Impact of the Stock Market on the Economy," *Market Perspective*, Manufacturers Hanover Securities Corporation, November 12, 1987.

[19] One theory linking investment to the stock market, generally referred to as the "q theory," was developed by James Tobin in "A General Equilibrium Approach to Monetary Theory," *Journal of Money, Credit and Banking*, February 1969. According to this theory, investment in new plant and equipment varies directly with the ratio, q, of the market value of existing plant and equipment to the replacement cost of that capital. When stock prices fall, businesses that want to expand productive capacity find it cheaper to buy another firm than to build their own facilities, so real capital spending is low. Despite its theoretical plausibility, "the hypothesis has not fared well in empirical tests," according to Victor Zarnowitz, "Recent Work on Business Cycles."

Another approach, the cost of capital theory, also implies investment spending would decline when stock prices fall. This approach is most associated with Dale W. Jorgenson in, for example, "The Theory of Investment Behavior," in Robert Ferber, ed., *Determinants of Investment Behavior*, Columbia University Press, 1967. This approach emphasizes the cost of obtaining funds to finance investment projects. Since the cost of equity financing increases when stock prices decline, the cost of capital theory also implies that investment spending would be reduced by a fall in stock prices.

CHART 4 (Continued)
Stock prices and recessions



that sales could be sluggish, due for example to the decline in consumption spending resulting from the stock market, could further reduce investment.

Empirical evidence on the sensitivity of investment spending to stock market fluctuations is mixed. Some large structural models, such as the Federal Reserve-MIT-University of Pennsylvania model, indicate that a decline in the stock market might have almost as much effect on investment as on consumption.[20] But there is little direct evidence confirming a significant relationship between stock prices and investment spending. So it cannot be said with confidence whether the recent decline in stock prices will depress investment spending this year.

Overall, then, the stock market crash could be expected to reduce consumption spending and possibly investment spending. But the economy was strong immediately before the crash, and an improvement in the real trade balance is widely expected to help boost the economy this year. Moreover, interest rates have declined substantially from the peaks in early October. The decline in interest rates can be expected to stimulate spending somewhat, partially offsetting the adverse effects of the stock market crash. Whether the decline in stock prices is enough to cause a recession is thus not clear from analysis of its direct effects. For that reason, it is useful to examine whether past declines in the stock market led to recessions.

Historical relation of stock market and recessions

Economists disagree on how reliably the stock market predicts recessions. In the weeks follow-

[20] See Pearce, "Stock Prices and the Economy," p. 21.

ing the recent plunge, for example, some economists claimed that historical evidence suggested a recession in 1988 was a virtual certainty, while others seemed to agree with the assessment of a DRI economist that "The market is a lousy predictor of a recession."[21] Part of the reason for the disagreement is that analysts study different periods and use different criteria for associating stock market fluctuations with business cycles. Analyzing a long period using a variety of techniques may thus be the best way of evaluating the accuracy of predicting recessions by stock price movements.

The relationship between stock prices and recessions is shown in Chart 4. The chart documents that declining stock prices have typically, but not always, been associated with recessions since 1900. Moreover, the cyclical timing of stock price declines varies considerably. Although the stock market sometimes turns down before the onset of a recession, it sometimes declines only after a recession has already begun. The chart thus illustrates that there is not a one-to-one relationship between stock market declines and subsequent downturns in economic activity.

A more detailed examination of declining stock prices and economic activity since 1900 is shown in Table 1. The 22 periods of declining stock prices listed under the first column are those in which the Standard and Poor's composite index of industrial stock prices declined at least 10 percent. (Details are provided in footnotes to the table.) The 19 recessions in the second column are those identified by the National Bureau of Economic Research. The magnitude of the decline in stock prices is shown in the third and fourth columns. The total decline in column 3 is the percentage decline from the highest quarterly average of stock prices to the subsequent lowest quarterly average. Column 4 shows the percentage decline from the peak in stock prices to the beginning of the associated recession (for those cases in which there was such an associated recession). The figures in column 4 are helpful in determining the extent to which the decline in stock prices contributed to causing a recession rather than merely reflecting declining profits and other effects of a recession. For the stock market to be used as a leading indicator, stock prices must decline before recessions begin whether the stock market is thought to be a factor causing changes in the economy or not.

There are four possible associations between stock price declines and recessions. These are shown in the fifth column of the table. The stock market successfully predicts recessions if a stock price decline is followed soon by a recession, as in 1906-07. The stock market can fail as a predictor of recessions for any of three reasons: because of no lead time between declining stock prices and the onset of a recession, as in 1902-03; because of a false signal from a stock price decline that is not followed by a recession, as in 1916-17; or because of a recession not preceded by a decline in stock prices, as in 1918-19.

By these criteria, the stock market has successfully predicted recessions about 41 percent of the time since 1900. Of the 21 appreciable declines in stock prices before last year, 11 successfully predicted an imminent recession. Of the remaining 10 stock price declines, two provided no lead times and eight gave false signals of a recession. Six recessions were not preceded by a decline in stock prices. Omitting war years and the 1930s on the argument that these periods were affected by special factors, the success rate goes up only slightly to about 53 percent. Moreoever, there is no apparent trend toward increasing accuracy. The success rate since 1945 (42 percent) was negligibly higher than from 1900 through 1945 (40 percent). Regardless of how the period since 1900 is divided, therefore, appreciable

21 David Wyss, quoted in "Economists' Outlook," *Bondweek*, November 16, 1987, p. 8.

TABLE 1

Stock market declines and recessions

Periods of declining stock prices*	Recessions	Decline in stock prices (Percent change, S&P 500)		Association of stock price declines and recessions
		Total	Before recession	
1902:3-03:4	1902:4-04:3	27	0	No lead
1906:4-07:4	1907:2-08:2	35	11	Successful prediction
1909:4-10:3	1910:1-12:1	14	3	Successful prediction
1912:3-15:1	1913:1-14:4	23	7	Successful prediction
1916:4-17:4	—	28	—	False signal
—	1918:3-19:1	—	—	No decline
1919:4-21:3	1920:1-21:3	29	7	Successful prediction
1923:1-23:3	1923:2-24:3	12	5	Successful prediction
—	1926:4-27:4	—	—	No decline
1929:3-32:2	1929:3-33:1	82	0	No lead
1934:1-35:1	—	13	—	False signal
1937:1-38:2	1937:2-38:2	42	9	Successful prediction
1938:4-39:2	—	11	—	False signal
1939:4-42:2	—	34	—	False signal
—	1945:1-45:4	—	—	No decline
1946:2-48:1	—	23	—	False signal
1948:2-49:2	1948:4-49:4	10	3	Successful prediction
—	1953:3-54:2	—	—	No decline
1956:3-57:4	1957:3-58:2	15	4	Successful prediction
—	1960:2-61:1	—	—	No decline
1961:4-62:3	—	18	—	False signal
1966:1-66:4	—	13	—	False signal
1968:4-70:3	1970:1-70:4	25	16	Successful prediction
1973:1-74:4	1973:4-75:1	40	11	Successful prediction
1976:3-78:1	—	14	—	False signal
—	1980:1-80:3	—	—	No decline
1980:4-82:3	1981:3-82:4	14	6	Successful prediction
1987:3-87:4	—	—	20	—

*Periods were selected by the following criteria:
—Peaks must be 10 percent higher than the preceding and following troughs.
—Troughs must be 10 percent lower than the preceding and following peaks.

declines in stock prices successfully predict recession no more than about half the time.

But what about larger declines in stock prices? It might be argued that larger declines are more nearly comparable to the experience last fall. To test whether sharper declines in the stock market are more accurate in predicting recessions, the criterion for identifying stock market declines was raised to 15 percent and then to 20 percent. But the success rate goes down as the cutoff point for defining appreciable stock market declines is made more stringent, to 37 percent for a 15 percent cutoff and 35 percent for a 20 percent cutoff. Although the number of false signals declines, the number of successful predictions and of recessions not preceded by (the more stringently defined) declines in the stock market falls even more. The overall predictive power of stock prices thus deteriorates as the criterion for identifying appreciable declines is raised.

In summary, the stock market's track record in predicting recessions is mixed. This conclusion holds regardless of the historical period chosen or the criterion used to identify meaningful declines in stock prices. But the historical record may not tell the whole story regarding prospects for a recession this year. The recent decline in stock prices is unique in several respects. The October 19 crash was the largest one-day decline in stock prices ever. And the 20 percent decline in the Standard and Poor's index from the third quarter to the fourth quarter of last year was much larger than any previous peak-to-trough decline before a recession (see column 4 of Table 1). So while the historical record for previous stock market declines is mixed, the recent crash was so distinctive that it is outside the bounds of historical experience. At best, the past record provides a cautionary note to any confident prediction that the stock market decline last year makes a recession in 1988 inevitable.

Conclusion

That the current economic expansion eventually will be followed by a recession is a virtual certainty: all others have been. But whether a recession is inevitable this year is less clear. None of the arguments commonly given for a recession in 1988 is in itself entirely convincing. The length of the expansion need not imply it will end soon. Although monetary growth decelerated sharply last year, long-term and short-term interest rates did not behave as they have typically when monetary restraint was followed by a recession. And stock prices are not reliable enough as an indicator of the future course for the economy that the stock market crash last fall to make a near-term recession unavoidable.

Still, the cumulative effect of these and other unfavorable factors could lead to a recession even though none in itself is sufficient to do so. According to some studies, most postwar recessions can be traced to the combined effect of two or more adverse developments. Moreover, further shocks to the economy could occur in upcoming months that would push the economy into a recession. For example, continued weakness of the dollar could raise expected inflation and increase foreign investors' reluctance to buy U.S. securities, thereby raising long-term interest rates enough to choke off spending on housing and business investment. The need to reduce the federal budget deficit implies that expansionary fiscal policy may not be available for avoiding a recession next year. For that reason, the Federal Reserve must be particularly alert to incipient economic weakness in order to avoid undue monetary restraint that has been associated with recessions in the past.