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VICTOR ZARNOWITZNational Bureau of Economic Research
and the University of Chicago**GEOFFREY H. MOORE**

National Bureau of Economic Research

The Recession and Recovery of 1973–1976

ABSTRACT: Review of the evidence confirms the choice of November 1973 and March 1975 as the most recent business cycle peak and trough dates, respectively. A period of slow growth, dated from March 1973, preceded the recession. By most measures the recession was the most serious since 1937, but the decline in employment was brief and moderate. One implication is that loss of jobs has become a smaller factor than formerly in pushing up unemployment during recession. Another is that the growth of the cyclically stable service industries may well continue to reduce the overall severity of recessions. ¶ The recovery that began in 1975 was of about average strength during its first two years in terms of output, employment, real income, and retail sales but weak in capital investment. The inflation rate, which rose to unusually high levels during the 1970–1973 expansion and most of the ensuing recession,

NOTE: This paper was largely completed at the end of April 1977 and is based on the latest data available at that time through December 1976.

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dropped sharply thereafter and continued to decline during the first year or so of recovery. Although the decline during the recovery was unusually large, it was not altogether out of line with the historical relationship between rates of recovery in output and concurrent changes in the inflation rate.

[1] INTRODUCTION AND SUMMARY

This paper has two main objectives. The first is to present an analytical account of the major fluctuations in selected economic indicators and their timing in the recent business cycle recession and recovery in the United States. The second is to measure the severity of the recession and the vigor of the recovery, especially by comparing the 1973-1976 movements with earlier contractions and expansions.

In a recent NBER study (Moore 1975), tentative answers were given to the questions, When did the U.S. business expansion of the early 1970s begin to slow down? When did it end? In the first part of this report, we examine some new and revised data bearing on these questions and reconsider the answers in the light of this evidence. We also identify the most recent upturns in the selected indicators and use the information to date the business revival of 1975-1976.

In the second part of the report, measures of duration, depth, and diffusion of recessions are analyzed so as to place the most recent business recession in the United States in historical perspective. Patterns of recessions and recoveries during the last fifty years also are systematically compared. Throughout the paper, we concentrate attention upon the comprehensive time series on income and expenditures, value of output and sales, volume of production, employment and unemployment. These data were recently used to review and revise the NBER reference chronology of business cycle peaks and troughs during 1948-1970 as well as the growth cycle chronology of downturns and upturns (Zarnowitz and Boschan, 1975a, 1977). In addition, we examine many other important economic indicators in the areas of prices, trade, investment in plant and equipment, inventories, profits, money, credit, and interest rates.

Although several reports on the performance of the economy, policies, and expectations at various times during the 1973-1976 period have already appeared,¹ we may still be too close to those events to reach a deeper understanding of them. Still, any account of what happened should be guided by some notions about the proximate source of the observed changes. We therefore refer to several explanatory hypotheses with which our findings are (or are not) consistent, but we do not undertake to study the success or failure of economic policy during the period.

Summary of Findings

1. The peak in business activity preceding the recession of 1973-1975 came in November 1973. The trough marking the end of the recession came in March 1975. Thus the twenty-eighth recession in the National Bureau's business cycle chronology, which begins in 1854, lasted sixteen months. It was longer than any of the five preceding recessions during 1948-1970, of which the longest lasted eleven months. But during the first ten months, i.e., until September 1974, total output declined only moderately and total employment did not decline at all. Hence the most serious part of the recession was relatively brief, about six months.

The recession was preceded by a phase of slower growth, starting in March 1973. The upturn two years later brought with it rapid growth. Hence the slow-growth phase encompassing the recession lasted twenty-four months, which also was longer than any of the five preceding phases of slow growth associated with recession.

Through the end of 1976, when our analysis stops, the recovery had lasted 21 months. Business cycle expansions since 1948 have averaged 50 months, or 36 months if one excludes the exceptionally long expansion of 1961-1969. Periods of rapid growth, however, have been shorter, averaging 20 months, with a range of from 8 to 30 months. In general, periods of rapid and slow growth have been more nearly equal in duration than periods of expansion and contraction.

2. In terms of the overall decline in output and the rise in unemployment, the 1973-1975 recession was more severe than any of the five earlier recessions of the post-World War II period. But in terms of the reduction in employment, it was relatively moderate. One of the principal reasons for this anomaly is that the growth of the service industries, which are less affected by recession, offsets the decline in the goods-producing industries to a larger extent with respect to employment than with respect to output. Another factor is that the loss of jobs during recession in recent times has become a smaller source of unemployment than the increase in the labor force. As a result of these trends, employment has become more stable, relative both to output and to unemployment.

3. The continued rise in inflation rates, which hit double-digit levels in mid-1974, long after the recession began, stands in sharp contrast to the patterns of price behavior in earlier business cycle contractions during which the rate of inflation promptly diminished or, as in 1949 and the 1930s, deflation occurred. Probably more than in most business cycles of the past, the 1973-1974 slowdown-and-recession sequence was influenced by cost increases affecting food, fuel, and raw materials, and by supply restrictions, which tend to produce rising prices along with falling output. Unit labor costs and interest rates also rose more rapidly at a late stage of the recession than has been customary.

TABLE 1 Chronology of Peaks and Troughs in Nineteen Selected Indicators of Aggregate Economic Activity, Levels and Deviations from Trend, 1973-1975

Line	Series ^a	Peak in Deviation from Trend ^b . (1)	Peak in Series Proper ^c (2)	Trough in Series Proper ^c (3)	Trough in Deviation from Trend ^b (4)
In Physical Units or Constant Dollars					
1	Retail sales in constant dollars (59)	March 1973	March 1973	Nov. 1974	Nov. 1974
2	Final sales in constant dollars, Q (213)	Feb. 1973	Aug. 1973	Feb. 1975	Feb. 1975
3	Gross national product (GNP) in constant dollars, Q (50)	Feb. 1973	Nov. 1973	Feb. 1975	Feb. 1975
4	Mfg. and trade sales in constant dollars (57)	Feb. 1973	Nov. 1973	March 1975	March 1975
5	Personal income in constant dollars (52)	March 1973	Sept. 1973	March 1975	April 1975
6	Index of industrial production (47)	Sept. 1973	June 1974	March 1975	March 1975
7	No. of unemployed, inverted, h.s. (37)	Oct. 1973	Oct. 1973	May 1975	May 1975
8	Unemployment rate, total, inverted (43)	Oct. 1973 ^d	^d	^d	May 1975 ^d
9	Total civilian employment, h.s. (442)	Oct. 1973	July 1974	March 1975	March 1975
10	Persons engaged in nonag. activities, h.s. (42)	Oct. 1973	July 1974	March 1975	March 1975
11	Nonfarm employment, establishment survey (41)	Nov. 1973	Sept. 1974	June 1975	June 1975
12	Employee-hours in nonag. establishments (48)	Nov. 1973	Oct. 1974	June 1975	June 1975
In Current Dollars					
13	Sales of retail stores (54)	March 1973	n.t.	n.t.	Nov. 1974
14	Value of goods output, Q	Nov. 1973	n.t.	n.t.	Feb. 1975

15	Gross national product, Q (200)	Nov. 1973	n.t.	n.t.	Feb. 1975
16	Final sales, Q	Aug. 1974	n.t.	n.t.	Feb. 1975
17	Manufacturing and trade sales (56)	Aug. 1974	Aug. 1974	March 1975	March 1975
18	Wages and salaries, mfg., mining, construction	Sept. 1974	Oct. 1974	March 1975	May 1975
19	Personal income (223)	Oct. 1974	n.t.	n.t.	April 1975

n.t. = no specific cycle turn.

NOTE: For quarterly series, the turning points are identified by the middle month of the quarter.

^aSeries are listed roughly according to the timing of the turning points shown to the right, from the earliest to the latest. Q denotes quarterly series; h.s., household survey. Series numbers are those used in *Business Conditions Digest*.

^bRelated to growth cycle downturn (peaks) and growth cycle upturn (troughs).

^cRelated to business cycle recession (peaks) and revival (troughs).

^dSince the trend in the labor force is implicitly allowed for in computing the unemployment rate, it is used here without further trend adjustment.

Weaknesses on the demand side, which contribute to output reductions and often counteract price rises, developed early in certain sectors of the economy—notably construction—and later became increasingly apparent. The declines in the rate of inflation, in labor costs and in interest rates, when they finally did come, were unusually large by historical standards.

4. The recovery through 1976 was moderately strong—just a little short of the average of recent recoveries. In past recoveries, back as far as 1921, high rates of growth in output during the first year and a half or so have been accompanied by substantial increases in the rate of inflation, while recoveries with low rates of growth have been characterized by modest increases or reductions in the rate of inflation. The continued decline in the rate of inflation during the first year of the 1975–1976 recovery was more or less in line with this historical relationship.

5. The distinctive features of recent developments derive largely from the impact of rampant inflation and fuel and materials shortages in 1973–1974, and later from continuing fears of a recurrence of such phenomena and the consequent caution in the behavior of economic decision makers. The external and unexpected changes in relative prices and the inflation rate made economic measurements particularly difficult and, at least on a current basis, frequently unreliable and sometimes misleading. But the basic economic motivations persisted, and in the end, they account for the reappearance in this episode of many familiar cyclical reactions such as the sharp decline and rise of inventory investment in 1974–1975.

[2] ECONOMIC CHARACTER AND TIMING OF THE 1973–1976 SLOWDOWN, RECESSION, AND RECOVERY

Measures of aggregate output, income, sales, and employment provide a composite profile of “business cycles” defined as fluctuations in overall economic activity. As a group, their cyclical peaks ordinarily coincide with each other approximately, and so do their troughs. Hence they can be used to identify the peaks and troughs of general business expansions and contractions. The set used here (Table 1) consists of twelve series in real terms and seven in current dollars. The latter are used in addition to the former partly because aggregates in current dollars represent the original form in which many economic transactions take place and are motivated. We use them also because adjustments for changes in the price level, particularly during 1973–1976, are subject to considerable margins of error. But in the dating of business cycles, wherever there are substantial differences in the timing of current dollar and physical volume series because of inflation, we have given decisive weight to the latter, as rep-

CHART 1 Selected Measures of Aggregate Economic Activity, 1972-1976

A. Indicators of the Physical Volume of Activity

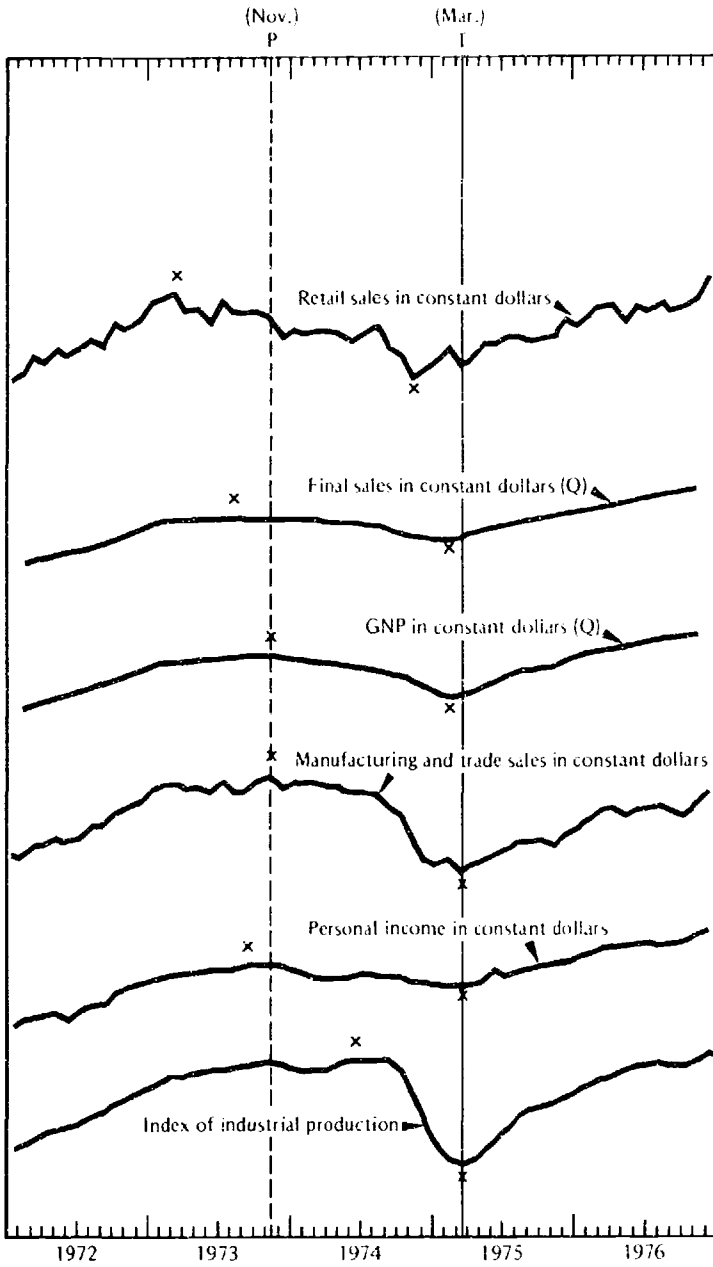
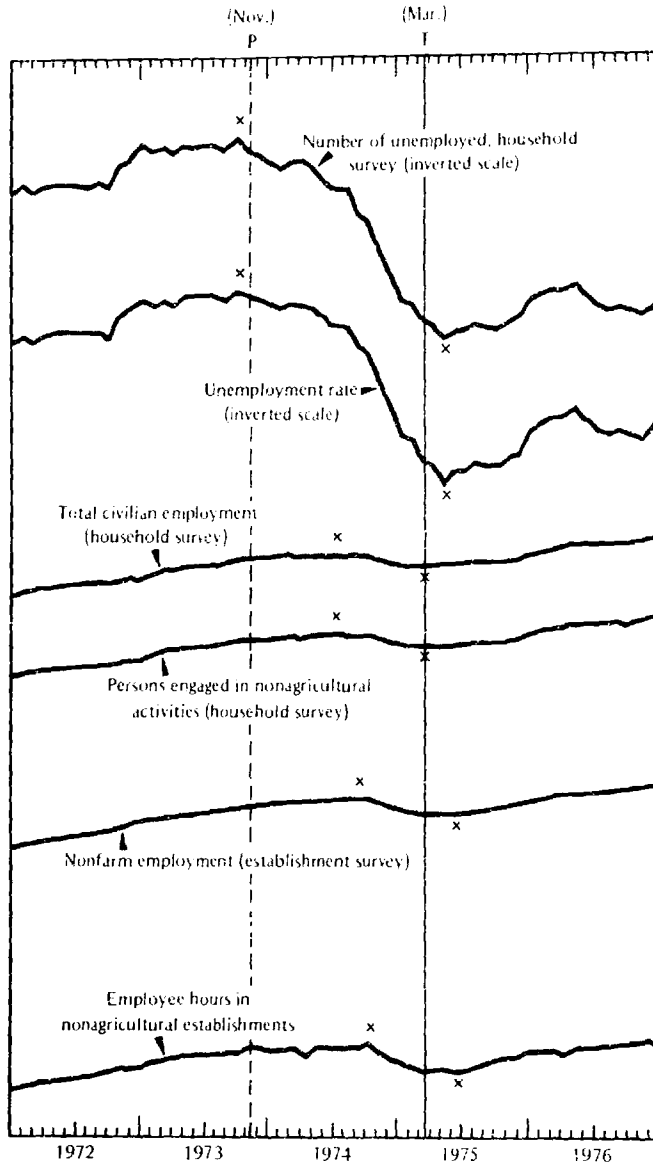
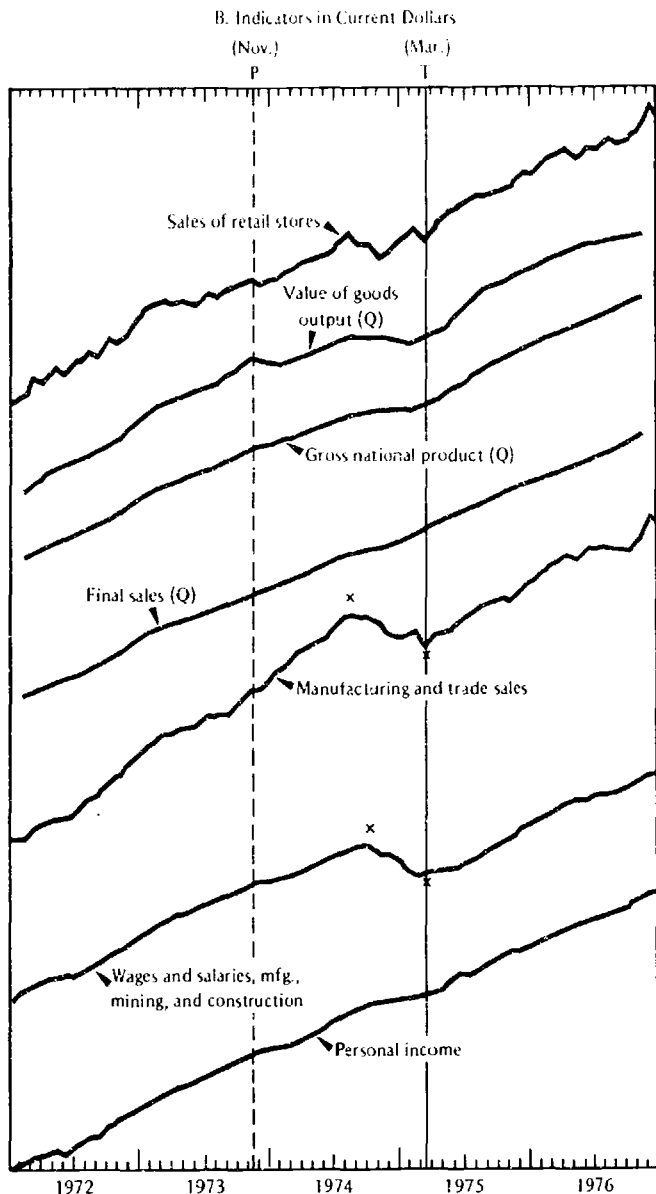


CHART 1 (continued)



representing more closely what is commonly understood by recession and recovery. Moreover, since aspects of general economic activity admit of different measurements and their alternative statistical representations contain largely unknown data errors, we do not hesitate to consider the evidence from two or more related or partly overlapping series for some of the processes covered.

CHART 1 (concluded)



The dates of the critical turning points in the nineteen series in the recent recession-and-recovery period refer to the series proper (Chart 1) and deviations of the series from their long-run trends (Chart 2) from 1972 through 1976.

CHART 2 Selected Measures of Aggregate Economic Activity, Deviations from Trend, 1972-1976

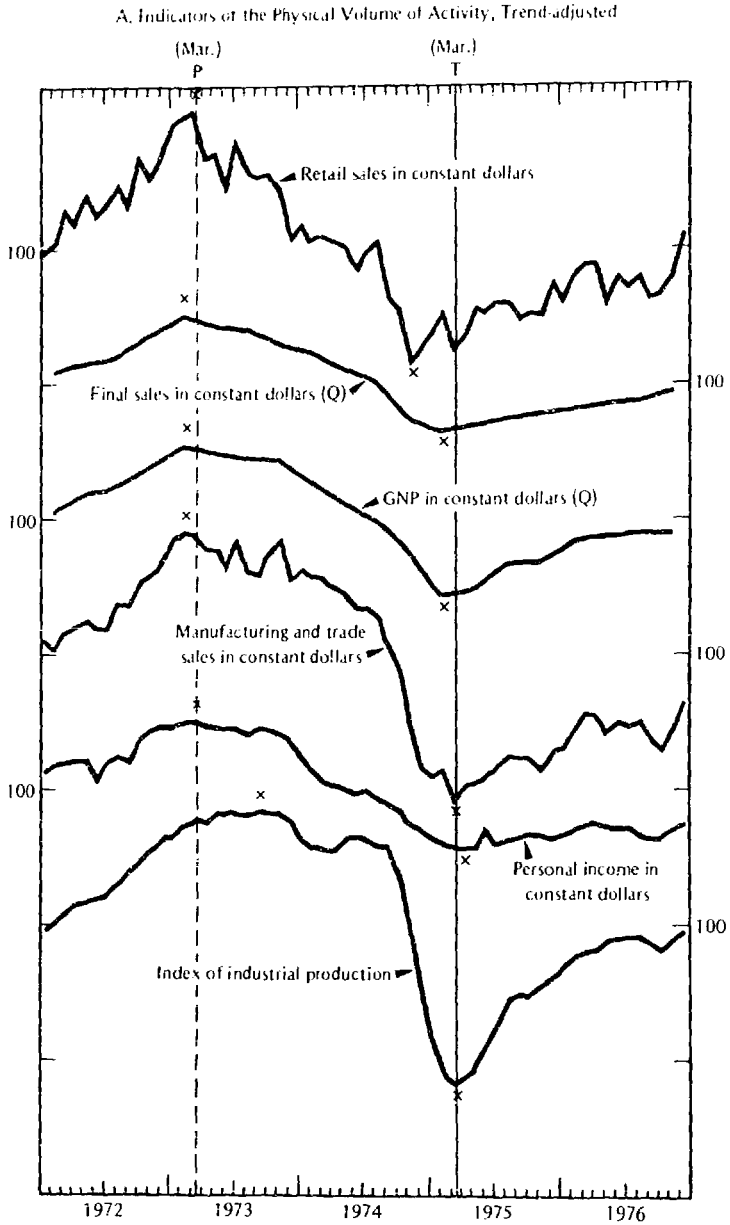


CHART 2 (continued)

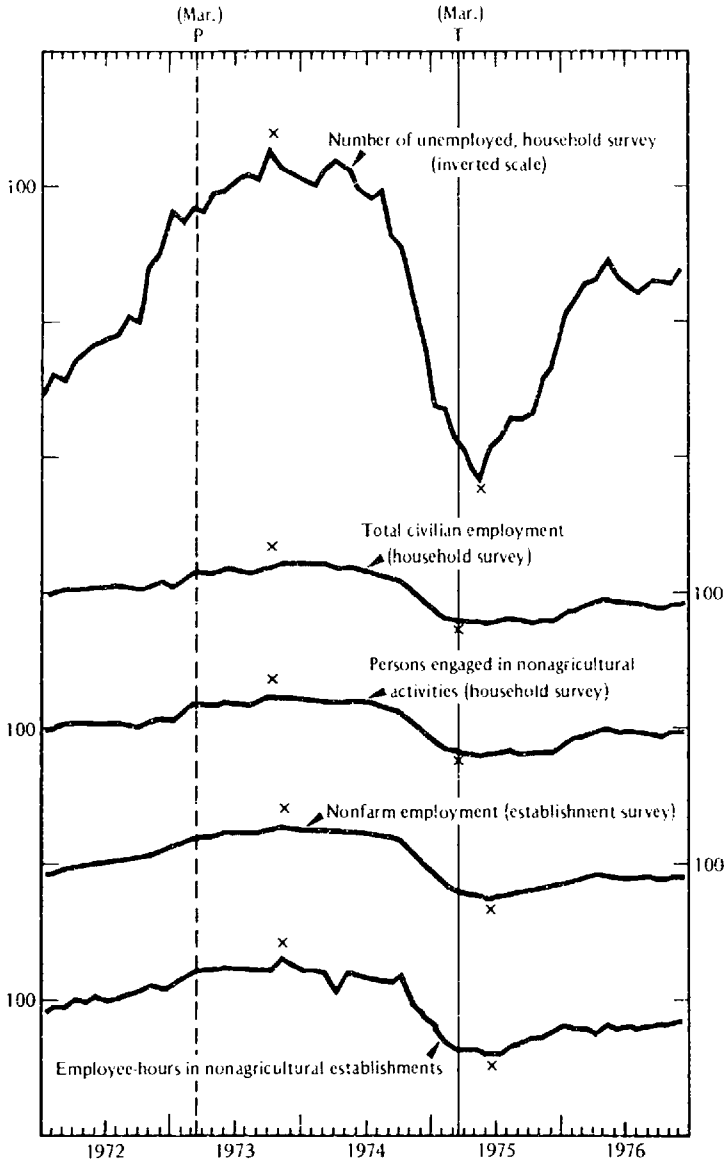
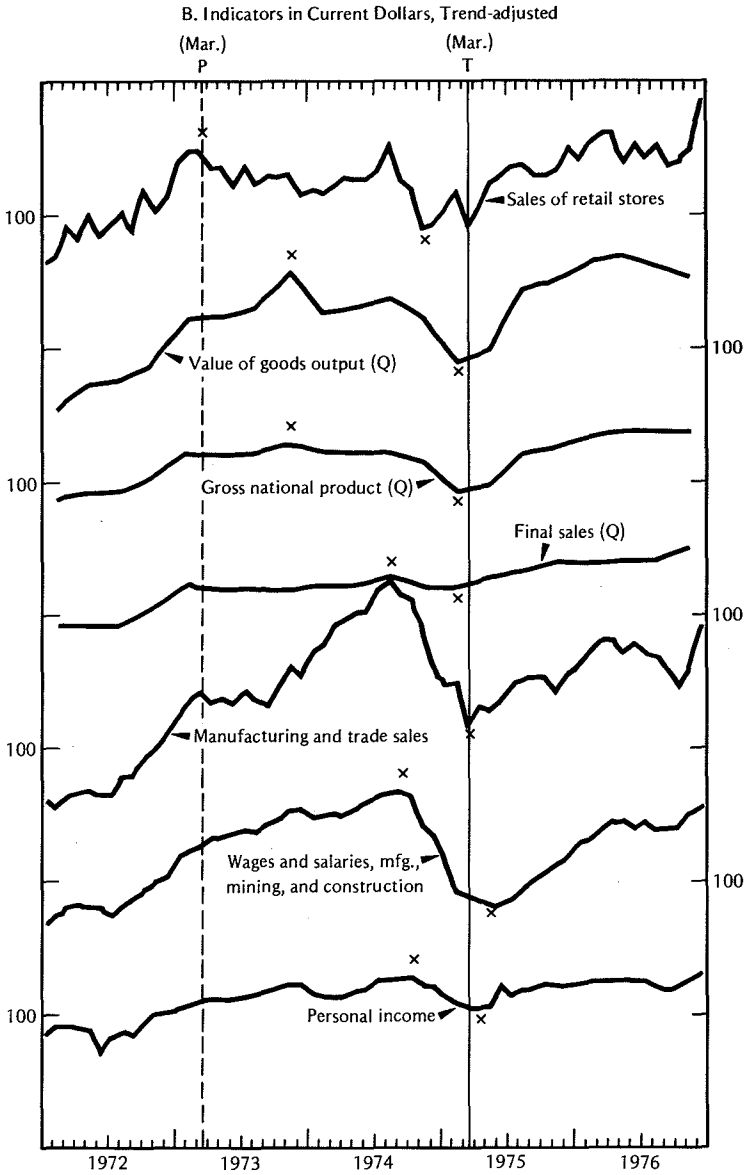


CHART 2 (concluded)



The 1973 Slowdown

The expansion that began toward the close of 1970 was very brisk initially, rebounding from the General Motors strike. It moderated briefly in the first half of 1971, and then resumed rapid growth, which extended into the first quarter of 1973. A period of slow but positive growth followed in the next three quarters, approximately through November 1973.

The chronology of peaks in deviations from trend of the nineteen selected indicators, which is presented in Table 1, column 1, shows when the slowdown of 1973 began and how it spread. These dates identify the peaks in time series obtained by dividing the successive observations for each indicator by the corresponding trend values, where the trend is measured in such a way as to cut through the short-run cyclical movements in the series.² The detrended series themselves are shown in Chart 2. Declines in the trend-adjusted series represent periods of slowdown in the sense that the series was either rising less rapidly than its trend rate of growth or actually declining.

The sharpest early decline occurred in the constant-dollar sales of retail stores, for which March 1973 denotes the peak in both the level and the deviation from trend. Retail sales in current dollars continued to move up but evidently only because the effects of price rises outweighed those of quantity decline; the growth rates even for this series fell off substantially, and the deviations from trend also turned down early. In February 1973, too, total manufacturing and trade sales in constant dollars shifted from a high-growth to a low-growth phase, though the nonretail components held up sufficiently well to delay the peak in this comprehensive series until November. Personal income in constant dollars, after allowing for trend, declined after March 1973. Furthermore, the first quarter of 1973 witnessed peaks in deviations from trend in three major quarterly indicators: GNP and final sales (GNP minus inventory change), both in 1972 dollars, and the GNP "gap" (potential less actual GNP, inverted). The data in Table 2, which contains a selection of quarterly measures of the economy's performance, confirm the occurrence of a widespread slowdown between the first and fourth quarters of 1973 (see in particular line 3 and note also that unemployment—line 21—stopped declining after the first quarter).³

Although personal income grew little when measured in constant dollars, its rise was substantial when measured in current dollars, and these nominal increases were subject to the progressivity of the income tax system. As inflation pushed up the effective tax rates, it worked to reduce any further gains in real *disposable* (after-tax) income. The weakening of disposable income after adjustments for inflation would be expected to adversely affect real consumer expenditure, and hence also real retail sales. Accepted consumption theory and prior empirical evidence indicate that this relationship is a powerful one, though with significant lags and slippages in the short run. On this occasion, real consumption and sales reacted unusually promptly and strongly, probably

TABLE 2 Levels, Deviations from Trend, Relative Changes, and Composition of Gross National Product and Other Selected Indicators, 1973:1-1976:4

Line	1973				1974				
	First Quarter (1)	Second Quarter (2)	Third Quarter (3)	Fourth Quarter (4)	First Quarter (5)	Second Quarter (6)	Third Quarter (7)	Fourth Quarter (8)	
Gross National Product (GNP) in Current									
1	GNP, bil. current dollars, ann. rate	1,265.3	1,288.4	1,317.5	1,355.1	1,372.7	1,399.4	1,431.6	1,449.2
2	Percent change, ann. rate	15.9	7.5	9.3	11.9	5.3	8.0	9.5	5.0
3	Percent of trend ^a	102.1	101.8	102.1	102.9	102.1	102.0	102.3	101.4
4	GNP, bil. constant (1972) dollars, ann. rate	1,229.8	1,231.1	1,236.3	1,242.6	1,230.4	1,220.8	1,212.9	1,191.7
5	Percent change, ann. rate	9.5	0.4	1.7	2.0	-3.9	-3.1	-2.6	-6.8
6	Percent of trend ^a	105.4	104.8	104.5	104.3	102.6	101.1	99.7	97.3
7	Implicit price deflator (1972 = 100)	102.9	104.7	106.6	109.1	111.6	114.6	118.0	121.6
8	Percent change, ann. rate	5.9	7.0	7.5	9.7	9.5	11.5	12.4	12.7
Selected Components of									
9	Personal consumption expenditures	767.7	766.8	770.4	765.9	761.8	761.9	764.7	748.1
10	Percent of GNP	62.2	62.2	62.1	61.5	62.2	62.8	63.3	62.9
11	Fixed nonresidential investment	128.5	130.7	132.5	132.4	133.5	131.6	127.3	121.8
12	Percent of GNP	10.3	10.4	10.5	10.4	10.6	10.6	10.5	10.5
13	Fixed residential investment	64.4	62.0	58.3	54.0	49.9	47.0	43.9	39.3
14	Percent of GNP	5.4	5.3	5.0	4.6	4.3	4.1	3.8	3.4
15	Change in business inventories	11.7	14.8	14.1	25.4	11.4	9.4	5.1	8.0
16	Percent of GNP	0.9	1.2	1.2	2.1	0.9	0.9	0.5	0.7
17	Govt. purchases of goods & services	255.2	251.2	251.8	252.0	255.4	256.1	257.1	256.9
18	Percent of GNP	21.0	20.6	20.4	20.5	21.0	21.3	21.6	22.0
Other Selected Indicators									
19	Indus. production index (1967 = 100)	127.5	129.3	130.6	131.4	129.8	131.0	131.8	124.6
20	Employees on nonagricultural payrolls (millions)	75.9	76.7	77.2	77.9	78.2	78.5	78.7	78.3
21	Unemployment rate (percent of labor force)	4.9	4.9	4.8	4.8	5.0	5.1	5.6	6.7
Composite Indexes (1967 = 100);									
22	12 leading indicators	133.0	132.7	131.9	130.1	129.1	126.4	120.7	111.9
23	4 coincident indicators	124.8	125.9	126.9	128.3	126.2	125.6	125.2	119.8
24	6 lagging indicators	114.4	120.4	128.9	132.3	133.4	141.0	146.5	145.7

NOTE: Series are used in seasonally adjusted form. P = specific cycle peak; T = specific cycle trough.

^aTrend estimated from twenty-five-quarter moving average of the data.

^bThe data in the odd-numbered lines are all in billions of 1972 dollars at annual rates. The data in the other lines are percent ratios of the expenditure component identified on the preceding line to GNP in current dollars for the same quarter, times 100.

^cThe leading index includes average workweek in manufacturing (mfg.); layoff rate, mfg. (inverted); contracts and orders for plant and equipment, 1967 dollars; net business formation; common stock price index; new building permits for private housing; vendor performance, percent of companies reporting slower deliveries; money balances (M₁) in 1967 dollars; percent change in total liquid assets; net change in inventories on hand and on order, 1967 dollars; percent change in prices of crude materials (excluding foods and feeds); new orders for consumer goods and materials, 1967 dollars (see BCD, May 1975, for further detail). The coincident index includes the series listed in lines 18 and 19 above; personal income less transfers, 1967 dollars; mfg. and trade sales, 1967 dollars (see BCD, November 1975). The lagging index includes: average duration of unemployment, inverted; unit labor cost, mfg.; mfg. and trade inventories, 1967 dollars; commercial and industrial bank loans outstanding; average prime rate; ratio consumer installment debt to personal income (see BCD, November 1975).

1975				1976			
First Quarter (9)	Second Quarter (10)	Third Quarter (11)	Fourth Quarter (12)	First Quarter (13)	Second Quarter (14)	Third Quarter (15)	Fourth Quarter (16)
and Constant Dollars and Implicit Price Deflator							
1,446.2	1,482.3	1,548.7	1,588.2	1,636.2	1,675.2	1,709.8	1,745.1
-0.8	10.4	19.1	10.6	12.6	9.9	8.5	8.3
99.2	99.6	102.0	102.5	103.5	103.8	103.8	103.8
1,161.1	1,177.1	1,209.3	1,219.2	1,246.3	1,260.0	1,272.2	1,280.4
-9.9	5.6	11.4	3.3	9.2	4.5	3.9	2.4
94.2	94.8	96.7	96.9	98.3	98.7	99.0	99.0
124.6	125.9	128.1	130.3	131.3	133.0	134.4	136.3
10.1	4.5	7.0	7.1	3.2	5.2	4.4	5.7
Real GNP and Shares of GNP ^b							
754.6	767.5	775.3	783.9	800.7	808.6	815.7	829.7
64.5	64.8	63.8	63.7	63.8	63.6	63.7	64.3
114.4	110.6	110.1	110.5	112.6	114.9	117.5	117.9
10.2	9.8	9.4	9.4	9.4	9.4	9.5	9.5
35.4	36.8	39.6	41.9	44.1	45.7	47.4	51.1
3.2	3.3	3.4	3.6	3.7	3.9	4.0	4.3
-20.5	-21.2	-1.0	-5.5	10.4	11.1	10.2	0.9
-1.5	-2.0	-0.1	-0.3	0.9	1.0	0.9	0.1
257.1	259.1	262.4	265.2	261.9	263.6	265.5	265.3
22.5	22.5	22.2	22.3	21.7	21.6	21.6	21.6
(quarterly aver. of monthly data)							
113.2	114.2	120.5	123.4	127.0	129.4	130.9	131.7
76.9	76.5	77.0	77.8	78.7	79.3	79.7	80.1
8.1	8.8	8.6	8.4	7.6	7.5	7.8	7.9
quarterly aver. of monthly data) ^c							
106.6	112.1	118.4	119.3	122.1	124.4	125.7	127.4
112.4	112.0	115.1	117.1	120.0	122.1	122.7	123.8
138.7	127.8	124.4	123.5	120.2	120.0	121.7	121.3

because of factors other than income that acted to depress consumer attitudes and expectations. The personal saving rate, unlike some past episodes, did not decline even briefly as income weakened; instead, it climbed from 6.8 to 8.7 percent of disposable income during 1973. This was associated with a sharp decline in personal consumption expenditures on automobiles, and a substantial one in consumer spending on durable goods generally.⁴

A plausible hypothesis, which has been recently advanced and tested with relative success, is that accelerating, unanticipated inflation tends to depress consumer demand by augmenting uncertainty about future changes in real income and raising the probability that real income may decline (Sandmo 1970, Juster and Wachtel 1972, Juster 1973, Juster and Taylor 1975, and Wachtel 1977). The greater the uncertainty, the higher are the personal saving rates that are expected to prevail at given levels of the other determinants of consumer behavior, notably real income and real financial wealth of households.

There are strong indications that expected inflation rates, though rising fast by historical standards, lagged far behind and thus underestimated greatly the actual rates. The evidence comes from data on price anticipations of the general public, from price-level forecasts by professional business analysts and economists, and from various contemporary comments and reactions. As an illustration, we tabulate below the median predictions of percent changes in the GNP implicit price deflator based on a quarterly survey of a sizable sample of economic forecasters:⁵

Rates of Change in GNP Implicit Price Deflator

Predicted, by Date of Survey

Period Covered	Dec. 1972	Feb. 1973	May 1973	Sept. 1973	Dec. 1973	Actual
1972:4-1973:1	3.6	4.9				5.7
1973:1-1973:2	3.2	3.6	4.5			7.0
1973:2-1973:3	3.6	3.6	4.5	5.3		8.2
1973:3-1973:4	3.6	3.6	3.6	4.9	6.1	8.7

It will be noted that, even in the latter part of 1973, inflation for that year was significantly underestimated, although naturally to a much smaller extent than earlier in the year.

Whatever the differences may be between economists' forecasts and expectations of the public at large, the lag in the perception of the accelerating inflation was surely general and substantial.⁶ This is not too surprising, considering how sudden and sharp the inflation flareup was. In terms of the annual rates of increase in the consumer price index (CPI) over six-month spans, for example, inflation rose from somewhat more than 3 percent in the first nine months of 1972 to about 5, 7, 8 1/2, and 9 1/2 percent in the last quarter of 1972 and the first three quarters of 1973, consecutively. As inflation persisted

and accelerated, consumers undoubtedly paid increasingly close and careful attention to price changes. Since the rate of inflation grew more variable as well as higher, it is likely to have increased the *dispersion* of inflationary expectations and hence the personal saving rate, in line with the real-income uncertainty hypothesis.

In retrospect, it is possible to give a rather lengthy list of the factors that probably contributed to the outburst of inflation: (i) the highly stimulative monetary and fiscal policies of 1971 (in part) and 1972 (as a whole), which in turn were responding to the sluggish recovery and high unemployment rates of 1971; (ii) exogenous influences that led to steep rises in prices of food, oil, and basic materials, including imports; (iii) the consequences of the depreciation of the dollar; (iv) the allocative distortions and "catch-up" effects of wage and price controls; and (v) the related increases in the attractiveness of export markets and shortages at home.⁷ But these rather complex developments, which are still far from being fully documented and understood today, were to a large extent obscure at the time.

The Index of Consumer Sentiment compiled by the Survey Research Center dropped from 94.8 (February 1966 = 100) in the third quarter of 1972 to 71.8 a year later. It was the largest continuous decline to the (at the time) lowest level in the history of this series, which goes back to 1953. Thus there is no doubt about the early and drastic deterioration in the mood of the consumer, judging from an index which several studies (Hymans 1970; Juster and Wachtel 1972) have found to represent an important determinant of consumer spending. The index in turn has been found to be affected by several presumptive causes of consumer confidence (or diffidence): the inflation rate had the strongest negative influence overall, with unemployment the second strongest, followed by the decline in the stock market (Lovell 1975).⁸

The sharp rise during 1973 in prices of raw materials (foodstuffs and feedstuffs, fuels, other minerals, and forest products) is generally attributed to expanding world demand bolstered by the large accumulation of international reserves and reduced supplies abroad of major agricultural products (mainly because of poor harvests) and some metals (because of strikes and political unrest). This rise, amounting effectively to much more than the 30 percent reported in the overall statistics, has been estimated to account for 45 percent of the increase in the CPI during 1973 (Popkin 1974). It seems likely that large amounts of crude commodities were purchased in 1973-1974 for holding rather than processing in production. Trading in commodity futures markets expanded dramatically. Speculation due to anticipations of price rises and, importantly, fears of inadequate supply raised the demand for raw materials by industrial users.⁹

Shortages, misallocations, and major discrepancies between expectations and subsequent realizations of prices (and hence also of real wages) evidently combined to have disturbing effects on the growth of output and productivity.

Output per manhour in the private nonfarm sector reached a peak in the first quarter of 1973, held steady at a lower level in the next three quarters, then decreased further through 1974. Concurrent with this decline in labor productivity was a decline in real wages (average hourly earnings and average hourly compensation in the private nonfarm sector, in constant dollars). These movements were both considerably longer and larger than any other declines in labor productivity and real wages in recent times. (In fact, since the end of World War II real wages had rarely decreased at all, and the few declines were very short and small.) A partial explanation, at least, may lie in the increasing relative importance of the service industries, where output per manhour and hourly earnings are lower (see below).

Money wages (monthly data on average hourly earnings of nonfarm production workers) increased in 1973 at annual rates of about 6 1/2 to 7 percent, only slightly higher than in 1972 and not out of line with the trend since mid-1967. Unit labor costs, remarkably stable in 1972, increased sharply in 1973 under the double impact of increases in employers' social security and other payroll taxes and the cessation of growth in output per man-hour. Corporate profits after taxes, and after inventory valuation and capital consumption adjustments as well, sagged slightly during 1973, while profit margins, computed on the same basis, declined sharply. Yet both consumer and wholesale prices rose at a sharply increased pace, outrunning wages and unit labor costs. The major factor that helps to explain these at first blush puzzling developments is by now familiar: the explosive rise in the prices of food, fuel, and raw materials. The great speedup in the rate of inflation coincided with, and is in part attributable to, the pressures of world demand for farm products and energy-generating materials upon the increasingly scarce supplies of these commodities (with the external demands now becoming effective because of the depreciation of the dollar and the related expansion of foreign money supplies). Further, it is evident that these unique developments caused a significant temporary reallocation between the industrial and farm sectors, which benefited few (farmers, some exporters) and hurt many in the U.S. economy (consumers and most industrial employees and enterprises).¹⁰

However, threats to continuing expansion are seldom perceived promptly, and on this occasion especially, public recognition seems to have lagged far behind events. This is not so surprising in view of the novel and complex elements in the situation and the increased difficulty of measuring the ongoing change. In particular, the problem of adjusting sales, orders, inventories, and profits for changes in prices during an inflation of uncommon type and intensity created many uncertainties and inconsistencies.¹¹

Despite the developing slowdowns in sales and output, employment rose swiftly during nearly all of 1973, keeping the unemployment rate steady though not reducing it (Table 2, lines 20-21). Only in October-November did the growth of employment begin to slacken and the first upturns occur in the

levels and rates of unemployment. Meanwhile, industrial production gained very little after August and turned down for several months after November. Business investment expenditures on equipment in real terms kept rising through 1973, though less vigorously than in the two preceding years of the expansion, while investment in structures, which turned up late and increased weakly in 1972–1973, peaked in the third quarter.¹² Final sales in constant dollars reached their peak in the third quarter, real GNP in the fourth (Table 2, line 4). The low-growth phase was giving way to declines in many economic activities.

The 1973–1975 Recession

The specific peak dates listed in Table 1, column 2, span a period of twenty-one months (February 1973–October 1974), which might seem a surprisingly large dispersion over time in downturns of “roughly coincident” indicators. Actually, a few of these series do not display a systematic pattern of coincident timing at peaks.¹³ A small part of the observed dispersion reflects this behavior, but the main part is explained by the strength of the concurrent forces of inflation and recession which were peculiar to the 1973–1975 period.

Accounts of the first stage of the recession have emphasized the adverse impact on the economy of the huge rise in the price of imported oil, but it is important to realize that the energy crisis aggravated a situation that was already precarious. Undoubtedly, the imposition in October 1973 of the Arab oil embargo, which was to last through mid-March 1974, was a serious shock. The concomitants of the embargo included shortfalls in automotive gasoline and production cutbacks in the automobile and some other industries. The industrial production index for consumer goods declined from October 1973 through February 1974, in large measure in response to supply constraints which sharply raised production costs (the index then regained most of its losses before turning down decisively in August). Construction of housing suffered substantially. Inventory investment, which reached a high peak in the fourth quarter of 1973, dropped sharply in the next quarter. Despite continuing strength in some sectors—especially in services and producers’ durable equipment—GNP in constant dollars declined and did not recover in 1974.

It is well to remember, however, that inflation, shortages, weaknesses in consumption and in construction activity, and slowdowns in production all occurred in 1973 prior to the reduction in the oil supply caused by the action of the OPEC cartel. When that last shock was added to the earlier ones such as the large increases in the prices of food and imports other than fuels, the combined damage was too large to be effectively countered or absorbed by short-term shifts in U.S. consumption and production patterns. By that time also, slowdowns in other industrial countries were beginning to occur, with adverse implications for the demand for U.S. exports. The immediate consequences,

then, included (i) the production cutbacks mentioned above, (ii) more upward pressure on actual and expected inflation rates, and (iii) more downward pressure on real income of the private nonfarm sector of the economy.

Consumer outlays on goods and housing continued to bear the brunt of these adversities. The decline in retail sales of durable goods stores, which had begun several months before the oil embargo, now accelerated considerably; total retail sales in current dollars rose but slowly in the closing months of 1973 and registered a substantial loss in real terms. With interest rates moving up and stock prices down at increased rates, there was further erosion of real spendable income and real net worth of households in 1974. As inflation in terms of the annual rates of change in the CPI rose to 11 and 12 percent and the unemployment rate increased steadily from 5 to 6 and then 7 percent of the labor force, the consumer sentiment index fell from 76 in the fourth quarter of 1973 to 58 a year later, recording a further sharp drop in consumer confidence.

While there is, with the benefit of hindsight, little doubt about the qualitative nature or general direction of these developments, it is worth noting again that the available quantitative measures of changes in inflation and real economic activity are far from precise, particularly for a period as turbulent as 1973-1974. Comparisons of deflated value aggregates with series in physical units for a given industry or sector provide forceful and instructive reminders of this fact.¹⁴

In 1974 expected inflation rates continued rising but actual inflation accelerated still faster, as shown by the tabulation below:¹⁵

Period Covered	Rates of Change in GNP Implicit Price Deflator					
	Predicted, by Date of Survey					
	Dec. 1973	Feb. 1974	May 1974	Aug. 1974	Dec. 1974	Actual
1973:4-1974:1	6.1	7.4				12.6
1974:1-1974:2	5.3	7.0	8.2			9.5
1974:2-1974:3	5.3	5.7	6.6	8.7		12.1
1974:3-1974:4	4.5	5.7	5.7	7.8	10.8	14.3

Clearly, the intensity of the inflation was systematically underestimated in 1974 as in 1973, only more so. Forecasts of real GNP and unemployment also erred substantially on the optimistic side. As disappointments mounted and expectations correspondingly became less sanguine, real consumption expenditures stagnated through most of the year 1974 as did real disposable income.¹⁶

On the other hand, business income was not visibly impaired by inflation for some time and weakened only as the recession widened in 1974. Net corporate profits, in current or constant dollars, peaked in the third quarter of 1974.

After inventory valuation and capital consumption adjustments, profits declined mildly in 1973 and sharply in 1974, according to the present data; but this is hardly how most businessmen perceived them at the time. Profits and inventories, always difficult to measure, were subject to especially large distortions in the current data for this inflationary period. In any event, business spending, in contrast to consumer spending, continued strong well into the recession. Thus business fixed investment in current dollars rose throughout 1974; in constant dollars, it began to decline in the second quarter. Also, business inventories (book value) were being sharply increased through 1974, though again, inventory investment after valuation adjustment turns out to have declined substantially during that year.

The strength of business investment in materials and equipment (measured in current dollars) is usually reflected in an expansion of unfilled orders held by manufacturers, as new orders tend to rise faster than shipments for the products involved, mainly durable and in large part made-to-order goods (Zarnowitz 1973, chaps. 6, 8, and 9). Indeed, the value of durable orders backlogs increased continually and vigorously—over 70 percent—in the two years preceding September 1974, when it reached a peak of \$189 billion. New orders received by durable goods manufacturers crested at \$51 billion in August; those for nondefense capital goods, at \$14 billion in July. But adjustments for inflation wipe out the 1974 rises in these series: in constant dollars, new orders for durable goods gained little between March and November 1973 and declined thereafter, while new orders for capital goods rose strongly in 1973, then remained essentially unchanged for several months early in 1974, and fell sharply in the second half of the year. Contracts and expenditures for commercial and industrial plant construction show a definite contraction beginning late in 1973.

The reasons for this apparent turmoil and divergent movement in nominal and real investment are still far from clear. Many businessmen presumably scrambled to place orders for materials because of anticipated capacity shortages and fears of more inflation, and their apprehensions proved only too true (and in part self-fulfilling). Some of the investment in commodity stocks, as noted earlier, reflected speculation. At the same time, the accumulation of business on hand may have encouraged some firms to proceed with their capital investment projects. However, real gains from investment dwindled, and even the nominal gains could continue only as long as many businessmen failed to perceive the spreading weakness of consumer demand and their own profit position. The unusually long lag of recognition and adjustment was correspondingly costly; once it drew to a close, in mid-1974, business ordering was cut back drastically.¹⁷

The highly uneven incidence of the forces of contraction is reflected in both the course and changing composition of the comprehensive aggregates of output and employment. Real GNP declined nearly 4 percent at annual rates in the

first quarter of 1974; the index of industrial production lost 1.5 percent between November 1973 and February 1974. After the oil embargo was lifted, real GNP continued to decline at somewhat lower rates in the next two quarters (Table 2, line 2), while industrial production rose 1.7 percent between February and June and then resumed a slow downward drift through September. Several of the current-dollar aggregates of sales, income, and the value of output did not decline at all for periods long enough to qualify as cyclical contractions, and those few that did turned down late, in August-October (see Chart 1 and Table 1). This, again, clearly reflects the strength of the continuing inflation.¹⁸

The index of industrial production clearly shows a double-peak pattern, with the first high of 131.6 (1967 = 100) in November 1973 slightly below the second high of 131.9 in June 1974.¹⁹ The decisive downturn in the total index occurred only in October 1974. The major components of the index present a very mixed picture, as illustrated by the following tabulation:

1973 Peaks	Wt. in 1967	1974 Peaks	Wt. in 1967
Durable consumer goods (September)	8%	General business supplies (June)	7%
Materials, fuel and power (December)	38	Nondurable consumer goods (August)	21
Construction products (December)	6	Business equipment (September)	13
		Defense equipment (October)	7
	52%		48%

In terms of these market categories, declines in the output of materials, durable consumer goods, and construction products tended to turn the index down in late 1973. The renewed strength of the index in the summer of 1974 can be attributed principally to consumer nondurables, business equipment and supplies, and defense equipment. Many series in these late-turning categories are based upon kilowatt-hour consumption and man-hour inputs rather than direct measures of physical output. This may have imparted an upward bias to the index in this period (see the last paragraph of the appendix to this paper for an elaboration). Equipment production has often lagged in the past, but more so at troughs than at peaks and rarely by long intervals.

In the earlier post-World War II recessions, industrial production typically turned down a few months before the business cycle peak, probably in large part because output of materials declined early, reflecting the usual lead of inventory investment. On this occasion materials output and total inventory investment in constant dollars both peaked in the fourth quarter of 1973, but the decline in the former was not appreciable until the fourth quarter of 1974

despite the sharp drop in the latter. Also, in previous cycles the industrial production index reached its peak at about the same time as or a few months before the peak in output of goods as measured in the national accounts. But this time goods output peaked in the fourth quarter of 1973 and declined continuously thereafter, while industrial production fell and then rose again. It should be noted that the industrial production index does not include the output of the construction industry, which had declined early and sharply in 1973-1974. According to the national accounts, the output of goods and structures leveled off after the first quarter of 1973, reached its final peak in the fourth quarter, and fell steadily thereafter, so that by the third quarter of 1974 it was down more than 5 percent, whereas the industrial production index was still above its previous high. If construction activity were included in the industrial production index, as has long been urged, the weakness in the industrial sector of the economy in 1974 would have been plainer than the actual index now shows it to be.²⁰

Total employment—persons and hours—continued rising in 1974 for eight months or more after aggregate output had turned down and unemployment had turned up (see Chart 1 and tables 1 and 2). Short lags of employment at business cycle turns have occurred in the past, but the U.S. employment aggregates have generally exhibited roughly coincident timing. At the eight business cycle peaks between 1929 and 1969, nonfarm employment lagged twice (by two and three months, respectively), led four times, and coincided twice. Part of the explanation for the unusually long lag in 1973-1974 probably lies in the compositional shifts on both the demand and the supply side of the labor market, part in the widespread failure to recognize (or the tendency to underestimate) the weakness of the economy. The net accessions were concentrated in the service industries (including government), which in terms of employment have long been growing more rapidly than the rest of the economy. Service employment is relatively stable cyclically because overhead labor, workers in white-collar occupations, and compensation on a piecework basis are all particularly important here. Furthermore, because services cannot be stored, inventory swings are not a factor. Employment in the goods-producing sector (mining, manufacturing, and construction) turned down in November 1973 and declined steadily thereafter. But the rise in the service sector, which now accounts for roughly two-thirds of total employment, offset this decline until the autumn of 1974.

It is interesting to note that the service industries have had a more powerful stabilizing effect on employment than on output. The output of services, as measured in the national accounts, has usually risen during recessions, helping to offset the decline in output of goods and structures, just as in the case of employment. Moreover, the long-run growth in services output has been faster than in goods output; so its stabilizing effect on output, as well as on employment, has been rising. But the relative importance of services is significantly

greater in terms of employment than in terms of output. Two-thirds of the employed are now engaged in the service industries, but they account for less than half of total output. As a result, total employment rose during 1974 while total output fell, and the drop in employment in 1974-1975 was brief and moderate while the drop in output was prolonged and severe. The trend has been working in this direction during the entire postwar period, with the result that employment has become increasingly stable relative to output. In the 1948-1949 recession the percent decline in total employment greatly exceeded the percent decline in real GNP; by 1973-1975, the decline in employment was only a third as large as in GNP (cf. Table 6, lines 2 and 8, below). One effect of this has been to lower the overall rate of productivity growth and enlarge its cyclical swing.

These effects of service industry growth can be readily documented. The percent changes between 1973, the peak year in real GNP, and 1975, the trough year, were as follows:

	Goods	Services	Total
Real GNP	-10.0	+4.5	-3.8
Employment	-8.0	+4.6	+0.4

Within each sector output and employment behaved much alike; yet there was a substantial drop in total output and a small rise in total employment because of the greater importance of services in the employment total. The trend in these proportions can be seen in the following:

	1948			1973		
	Goods	Services	Total	Goods	Services	Total
Real GNP	61	39	100	57	43	100
Employment	45	55	100	33	67	100

A rough estimate of the effect of the shift in the importance of services can be made by applying the 1948 proportions to the 1973-1975 changes. The shift reduced the decline in real GNP by half a percentage point (from -4.3 percent down to -3.8 percent) and converted what would have been a decline in total employment to a rise (from -1.1 percent to +0.4 percent). Productivity growth has been adversely affected. Output per employed person dropped 4.2 percent between 1973 and 1975. Without the growth in importance of services the drop would have been only 3.2 percent. The effect on output per man-hour would be smaller because average hours worked per employee is smaller in services than in goods production.

Growth of the civilian labor force was unusually fast (3 percent) during 1973 and much slower (1.9 percent) during 1974 (compare these figures with the

averages of 2.3 percent in 1968-1972 and 1.8 percent in 1963-1967). The acceleration of the labor force trend beginning in the years preceding the recession reflected primarily a more rapidly growing population of working age and increases in certain participation rates, especially of women. Increased efforts of families to stem the inroads of inflation upon their living standards very probably drew additional persons into the labor market. During recessions "added workers" typically enter the market to bolster family income reduced or threatened by unemployment, shorter hours, or lower nonwage income, but this is more often than not outweighed by the tendency for some unemployed workers to become "discouraged" and withdraw from the job search. Semianual comparisons indicate a net decline in the labor force growth rates during the second half of 1973 and both halves of 1974. The quit rate, which reached a high plateau in 1973, declined early but not much and then remained rather stable through mid-1974. Workers as well as employers seem to have adopted a cautious but still hopeful stance in face of an uncertain situation which many viewed at the time as one of transitory troubles due to energy shortages rather than as an incipient recession. Thus businessmen continued to cut working hours (the average workweek in manufacturing drifted downward after February 1973) but kept layoffs low, presumably hoping to weather a short slack period without incurring the risk of losing experienced employees and the cost of high labor turnover.

Such tactics, however, can be followed but briefly, since they entail reduced productivity and rising labor costs per unit of output, with adverse effects on profits. Those tactics were not only dropped but sharply reversed as soon as it became clear that the economy was not going to rebound vigorously from the setback attributed to the embargo. By the third quarter of 1974, the persistence of inflation at alarming two-digit rates could no longer disguise the deterioration of real sales and profits, and sharp cutbacks in production and employment ensued (see Table 2) as enterprises attempted to gain control over rising inventories of finished goods and accelerating costs of production.

This phase of the recession bears a close family resemblance to contractions in aggregate demand that are typical of the "classical" business cycle. Much of the dramatic decline in total output during the last quarter of 1974 and the first of 1975 can be traced to the rapid fall in inventory investment (see Table 2). Such developments are ordinarily explained by business attempts to reduce stocks so as to bring them into a desired relationship with expected sales. (This relationship is the core of the acceleration principle and the more general stock-adjustment principle as applied to inventory investment.) With this added depressant effect on income and spending, manufacturing and trade sales contracted fast enough for several months to frustrate the apparent business intentions to reduce inventory-sales ratios.²¹ With the advent of 1975, however, inventory reductions took hold, and soon the rise in the overall ratio of business inventories to sales was arrested and reversed.

Other factors also contributed to the economy's sharp contraction in the fall-winter season 1974-1975. Business capital outlays on plant and equipment and consumer capital outlays on housing and automobiles declined in current dollars and, substantially, in constant dollars. In particular, the decline in real residential investment accelerated strongly in this period. In fact, all major expenditure components of real GNP decreased in the fourth quarter of 1974. But in the first quarter of 1975 total personal consumption expenditures turned upward, and so did state and local government purchases of goods and services.

Changes in money and credit appear to have played a more moderate role in the developments of 1973-1974 than in the earlier slowdown-and-recession phases of recent business cycles. In the last years of expansion preceding the business cycle peaks of 1953, 1960, and 1969, both the narrowly defined and the broader monetary aggregates showed sharply falling rates of growth relative to their long trends; in late 1972 and in 1973, the monetary growth rates declined also, but much less strongly and less abruptly.²² However, unlike the previous business recessions, during each of which monetary aggregates increased at accelerated rates, the 1974 contraction was accompanied first by relatively steady and then, particularly in the third quarter, by declining rates of growth in these series. The slow growth of the money stock at this time has been blamed by some analysts for the marked weakening of the demand for goods and services (as represented by current-dollar GNP) in the two quarters ending March 1975. But this particular linkage would imply an unusually prompt and strong reaction to what the present statistics show was a relatively brief and mild dip in the growth of money stock in nominal terms, which is the unit of measure relevant to current-dollar GNP. In real terms, owing to the high and rising rate of inflation, the money stock entered upon an extended and substantial decline early in 1973, and by mid-1974 had dropped about as much as it did prior to and during the 1957-1958 recession. But real GNP dropped faster and further than it did then. Moreover, the hypothesis that the extensive decline in the real money stock was responsible for the severity of the recession runs up against the fact that real GNP began a sustained recovery early in 1975 and a year later had regained its preceding peak level, whereas the real money stock meanwhile experienced no growth whatever.

In the past, slowdowns in economic growth have always been accompanied by reductions in the rate of inflation, but the lag in this relationship has been getting longer. On this occasion, it took several months of recession accompanied by declining rates of monetary growth before the pace of inflation began to recede. Not until mid-1974 did decisive downturns occur in comprehensive measures of inflation—first in the rate of change in wholesale prices for industrial commodities and soon thereafter in the rate of change in consumer prices. (As usual, earlier signals of these reductions came from sensitive price indexes relating to selected crude and industrial materials.) This helped

greatly to check the decline in real income and in consumer confidence. Short-term market interest rates and long-term bond yields generally turned down in the third quarter of 1974, reducing the cost of credit. Stock prices stopped falling in the fourth quarter. Retail sales in constant dollars, which led the sequence of downturns in 1973, now headed the succession of upturns in comprehensive indicators of economic activity, as recorded in Table 1 (column 3). From its low point in November 1974, consumer spending in real terms began a solid advance. Although it was not generally recognized at the time, the end of the recession was near.

The 1975–1976 Recovery

The revival of consumer expenditures on automobiles and durable goods in general started well before the tax cut that took effect in May 1975, and even before the prospect of lower tax payments began to exert a favorable influence upon people's spending plans.²³ There are good reasons to think—the likelihood of an inventory investment turnaround is one of them—that the upturn of the economy in the spring of 1975 would have occurred when it did without the tax cut, but also that the fiscal stimulation contributed substantially to the recovery later, in the second half of the year. Fiscal actions probably had little, if any, net expansionary effect before 1975, whereas the initial signs of an upturn came earlier.²⁴ Among these were the declines in the cost of credit and in the cost of materials, mentioned above.

Only seven months (November 1974–June 1975) separate the earliest from the latest of the specific trough dates in the comprehensive series listed in Table 1, in sharp contrast to the 21-month period spanned by the peaks of 1973–1974 (cf. columns 2 and 3). The transition from recession to recovery was much swifter than the transition from expansion to recession. Lengthy periods of economic slowdown in late expansion and relatively swift movements out of recession into recovery have been typical of other recent business cycles in the United States, particularly during 1955–1971.²⁵

Initially, the recovery derived its strength almost entirely from consumer spending, which more than compensated for the weaknesses in business investment and federal purchases. In the second quarter of 1975, real GNP increased 5.6 percent at an annual rate, while personal consumption and residential construction increased approximately 7 and 17 percent, respectively. At the same time and measured the same way, nonresidential fixed investment fell 14 percent, and total government purchases of goods and services declined 3 percent. The liquidation of business inventories at all stages of fabrication proceeded at a rapid pace for another quarter, as shown in Table 2, line 15.

In the second half of 1975, growth of real consumption expenditures moderated, but growth of real GNP soared to 11.4 percent in 1975:3 (among the

highest rates ever recorded and exceeded only during the rapid expansion of 1950), then fell to 3.3 percent in 1975:4. Of major importance here was the sharp diminution of the downward pull on the economy exerted by inventory liquidation. Moreover, real investment in residential structures increased strongly, particularly in the third quarter. Nonresidential fixed investment in 1972 dollars declined very slightly in the third quarter and rose similarly in the fourth. Purchases of goods and services at all levels of government increased moderately.

Growth in real GNP reaccelerated to over 9 percent per year in the first quarter of 1976, with most expenditure components scoring good gains (Table 2). The gains for fixed investment, however, pertained to levels that were still low, not much above the 1975 troughs and well below their average levels for 1974. Inventory accumulation at the annual rate of \$10.4 billion replaced the liquidation phase of 1975. This turnaround, in fact, accounted for a large part of the total rise in real GNP during winter 1976: final sales in 1972 dollars increased at an annual rate of slightly less than 4 percent. Total government purchases of goods and services in constant dollars *declined* some 5 percent.

In the second quarter of 1976, growth in real GNP fell to slightly less than half the rate in the first quarter, but this was due entirely to a cessation of the fast growth in business inventory investment. Final sales in real terms increased a little over 4 percent owing to an equal proportional gain in consumption, much larger gains in nonresidential and residential fixed investment (over 8 and 15 percent, respectively), and an unexpectedly small gain in government spending. The index of industrial production moved up almost 8 percent at annual rate in the second quarter, nonfarm employment almost 3 percent.

Finally, the data now available indicate that the expansion proceeded at a still slower pace in the second half of 1976. Real GNP rose at annual rates of 3.9 and 2.6 percent in the third and fourth quarter, respectively. However, what many contemporary observers deplored as a "pause" in the expansion was again due largely to business inventory investment, which remained remarkably steady in the first three quarters of 1976, then dropped drastically in the last.²⁶ Final sales in constant dollars increased at annual rates of 4.3 percent in the third and 5.5 percent in the fourth quarter. To some extent, the retardation in the growth of real GNP can also be traced to small gains or losses in the government sector and in fixed nonresidential investment.

These observations suggest that the recovery was widespread, but supported predominantly by gains in consumer spending (especially for automobiles and other durable goods) and by the transition from a massive disinvestment to a modest investment in business inventories. Capital outlays on plant and equipment and on housing, though rising at substantial rates, were still relatively low; their contribution to recovery during the first two years was unusually small by historical standards.

Series in physical units provide additional evidence of the progress of this expansion. While real GNP rose 7 percent in the year ending March 1976, the index of industrial production rose by 15 percent. For GNP, the increase approximately matched the decline during the recession; for industrial production, the previous peak levels were regained only by the end of the year. Employment, meanwhile, had risen 3 to 4 percent above its trough levels of 1975 and already exceeded the previous peak recorded in 1974.²⁷ The rise in employment exceeded the growth in the labor force and unemployment dropped from its high of 9 percent in May 1975 to 7.3 percent in May 1976, as many employees were recalled to their previous jobs.

The summer slowdown interrupted this progress briefly. The expansion was not robust enough to keep up with the persistently high rate of growth in the labor force. Unemployment rose to an average rate of 7.8 percent in the third quarter and reached 8 percent in November. Total civilian employment dipped slightly in September and October but was rising at a good pace again by the end of the year, and not only in terms of the number of persons with jobs but also relative to the total population of working age.

Unemployment, however, remained very high during this recovery. Its unusually slow decline has been attributed to several factors. First, the growth of the labor force continued strong, reflecting in large part rapid increases in the number of women and young people seeking work. Second, employment gains were particularly large in service industries, where many people work part-time, change jobs often, and have frequent spells of unemployment. Third, increases in unemployment compensation, which is not taxable, may have in effect subsidized and induced more temporary layoffs (Feldstein 1975, 1976). Unemployment benefits were extended in 1973 and 1974, lowering the costs of getting by without a job and enabling more people to search longer for better positions. Fourth, the increase in the average number of workers per family, which represents a source of additional support to the unemployed member, would have similar effects. The average duration of unemployment, which varied narrowly around 10 weeks from April 1973 through the end of 1974, rose rapidly to about 17 weeks by the end of 1975, then declined very slowly and irregularly to 15 1/2 weeks late in 1976. Finally, the argument has been advanced that many individuals who are not interested in working or are only marginally employable now register as seeking jobs and are counted as unemployed because of the introduction in the early 1970s of work registration requirements as a condition for receiving food stamps and other welfare benefits (Clarkson and Meiners 1977).

Since output, as usual in a recovery, expanded much faster than employment, labor productivity advanced rapidly. The index of output per man-hour in the private nonfarm economy (1967 = 100) increased from 108 to nearly 115 between the first quarters of 1975 and 1976, thus making up in one year for all the drop during the preceding two. (Its peak value was 114 in 1973:1.)

As a result of this gain, together with rather slower advances in wage rates, unit labor costs declined somewhat during 1975 after having increased sharply in 1973 and 1974. Profit margins improved dramatically. The ratio of prices to unit labor costs for the nonfarm business sector, which dropped substantially during 1973 and 1974, rose sharply in 1975. Total corporate profits, having fallen steeply in the last six months of the recession, made a strong comeback in the next twelve months.

As the supply of internal funds from corporate cash flows grew rapidly while business capital outlays turned up late and slowly, the demand for external funds fell sharply. Corporate bond placements were substantially reduced. Short-term borrowing declined most of all, partly as a consequence of the drastic inventory liquidation. Outstanding commercial and industrial loans from banks started contracting at the end of 1974 and drifted downward through most of the next two years. The shocks business confidence suffered in 1974-1975 led to much caution in borrowing, committing, and spending funds for investment. There was widespread concern about weak balance sheet positions and a strong motivation to improve them in the interests of liquidity and solvency. As a warning to many, business failures rose sharply during the recession and reached unusually high levels late in 1975. So business paid off large amounts of loans, mainly to banks, lengthened its debt structure, and built up ownership claims and liquid assets (Gilbert 1976; Yang 1976). Fixed investment was generally limited to what could be cautiously financed by internal funds.

The rate of inflation in terms of the consumer price index was 7 percent during 1975, a little more than half the corresponding figure of 12 percent for 1974. Moreover, the trend in that rate was definitely downward from mid-1974 through spring 1976, though not without short reversals, as in the summer of 1975. Later in 1976, inflation was slightly higher, at rates averaging a little over 5 percent. Price expectations, as usual, fluctuated much less than realizations: the data in Table 3 show that the median ASA-NBER forecasts of the GNP implicit price deflator turned out to be underestimates in periods of relatively high, and overestimates in periods of relatively low, inflation rates. Overestimates prevailed among the forecasts for 1975:2 and for the first three quarters of 1976.²⁸

Evidently, inflation moderated at a frequently surprising pace. This is presumed to have contributed greatly to the improvement in the economic position and outlook of the consumer and thereby to economic recovery at large. Real wages, other incomes, and outlays of households increased sharply; real disposable income rose even more sharply, as a result of the tax cut in May 1975, and soon recovered its previous peak level, reached in the fourth quarter of 1973. Although unemployment was high, the percent of the population *with jobs* was also relatively high, and this helped maintain incomes. The index of consumer sentiment moved up from an all-time low of 58 (1966 = 100) in

TABLE 3 Comparison of Median ASA/NBER Forecasts of Inflation Rate with Actual Rates, December 1974:4-1976:4

Period Covered	Rates of Change in GNP Implicit Price Deflator						Actual
	Predicted, by Date of Survey						
	Dec. 1974	Feb. 1975	May 1975	Aug. 1975	Nov. 1975	March 1976	
1974:4-1975:1	9.1	9.1					10.1
1975:1-1975:2	7.8	8.2	6.1				4.5
1975:2-1975:3	7.0	7.4	6.6	6.1			7.0
1975:3-1975:4	7.0	7.0	5.7	6.6	6.6		7.1
1975:4-1976:1		5.7	5.3	5.7	5.7	5.7	3.2
1976:1-1976:2			5.7	5.3	6.1	6.1	5.2
1976:2-1976:3				6.1	6.1	6.1	4.4
1976:3-1976:4					5.7	6.6	5.8

1975:1 to 84 in 1976:1. In contrast to business loans, households' borrowing for the acquisition of automobiles, other durables, and housing increased as sharply in 1975 as it fell in the preceding year.

Short-term interest rates, which reached record peaks of 12 percent and more in autumn 1974, fell to 5-8 percent in 1975-1976; long-term rates such as high-grade corporate bond yields fluctuated considerably but also declined over the same period, from well over 10 to near 8 percent. These movements presumably reflect reduced inflationary expectations as well as monetary developments and changes in the financial markets.

Growth rates in monetary aggregates, generally quite low early in 1975 and high in the second quarter, declined considerably in the latter part of 1975, then picked up once more and fluctuated widely but about more stable average levels in 1976. The broader totals, which combine means of payment with types of liquid assets of varying degree of "near-moneyness," grew at higher and on the whole more stable rates than did the narrower totals. All in all, monetary expansion proceeded unevenly over short time intervals and sustained neither a rapid nor a very sluggish pace. However, the narrowly defined money stock (M_1) increased more slowly than the price level, with the result that real money balances declined through the second half of 1975. In each of the earlier business recoveries since the end of World War II, real money balances experienced a sustained rise, except for the 1950-1951 period of the Korean War inflation. In the second half of 1975, when the slower growth of M_1 was causing some criticism of monetary policy as being overly restrictive, there was an exceptionally large rise in the income velocity of money, at least partly as a result of shifts to other means of payment.²⁹

Early in 1976, real money supply measured as $(M_1/CPI)100$ increased slightly, then remained virtually unchanged for the rest of the year. It should be noted

that when M_2 (which includes time deposits at commercial banks in addition to the demand deposits and currency included in M_1) is analogously expressed in real terms, the resulting series $(M_2/CPI)100$ shows a definite upturn in January 1975 followed by an expansion through 1976 interrupted only by several months of nearly zero change in the second half of 1975.

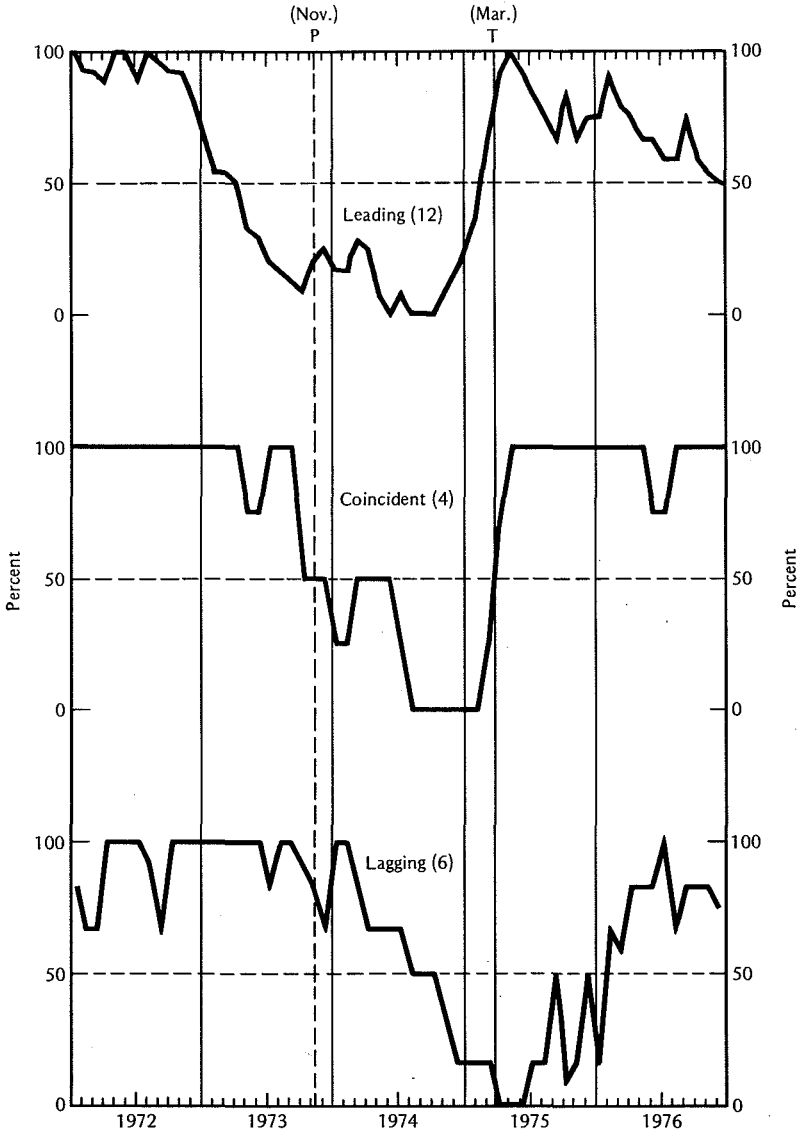
Dating the Recession and the Recovery

The phase of slow growth preceding a recession is as a rule associated with a spreading decline in the number of economic activities that are still expanding. In short, as the overall pace of the expansion decreases, so too does its scope; indeed, the latter process accounts in large part for the former. This can be illustrated by the so-called diffusion indexes, which represent, for a particular economic aggregate or index, the percent of components rising in successive time spans.

Chart 3 shows diffusion series measuring the percent expanding of the components of the indexes of leading, coincident, and lagging indicators. Since the numbers of the components are small, the series often move in large irregular jumps from month to month. Nevertheless, longer cyclical movements are discernible. Thus the diffusion index of the leading series, which reached its peak values of 100 percent late in 1972, dropped sharply during 1973, remained low late in 1973 and early in 1974, and dropped to zero in the summer and autumn of 1974. Soon thereafter it rose rapidly to 100 in May 1975 and then fluctuated, mostly between 50 and 75 percent, throughout 1976. Equally pronounced declines during the recession and rises during the recovery are exhibited by the two other diffusion series shown in Chart 3, with the major movements in the coincident index following those in the leading and preceding those in the lagging index.³⁰ The leads and lags were such that at the time the leading index reached zero, in June 1974, the lagging index was still about 70, and by the time the leading index had reached 100, in May 1975, the lagging index was still at zero.

Diffusion indexes generally lead the corresponding aggregates of composites and are positively correlated on a roughly synchronous basis with the rates of change in the same totals. This is so because when more than half of its components are rising the aggregate itself typically rises, and the more components are rising the faster it usually rises. Hence when the (plus or minus) deviations of a diffusion index from the base of 50 percent are cumulated, the result tends to be a comparatively smooth series with the same timing characteristics as those of the corresponding aggregate or composite index. All this applies well to the data discussed here. Chart 3 shows that the leading diffusion index stayed low (generally at values not exceeding 50) from July 1973 through March 1975; the coincident index, and also the overall index combining all 22 indicators, from November 1973 through April 1975; and the lagging index,

CHART 3 Diffusion Indexes of Twenty-two Leading, Coincident, and Lagging Indicators^a, 1972-1976



^a The diffusion indexes, which are published in *Business Conditions Digest*, represent the percent of indicators rising during a six-month span, centered in the mid-month of the span. The number of indicators included is shown in parentheses. For a list of the series, see Table 2, note c. On their characteristics and rationale, see Zarnowitz and Boschan (1975b, 1975c).

from October 1974 through February 1976. These data are either identical with or close to the peaks and troughs in the composite indexes of the leading, coincident, and lagging indicators.³¹

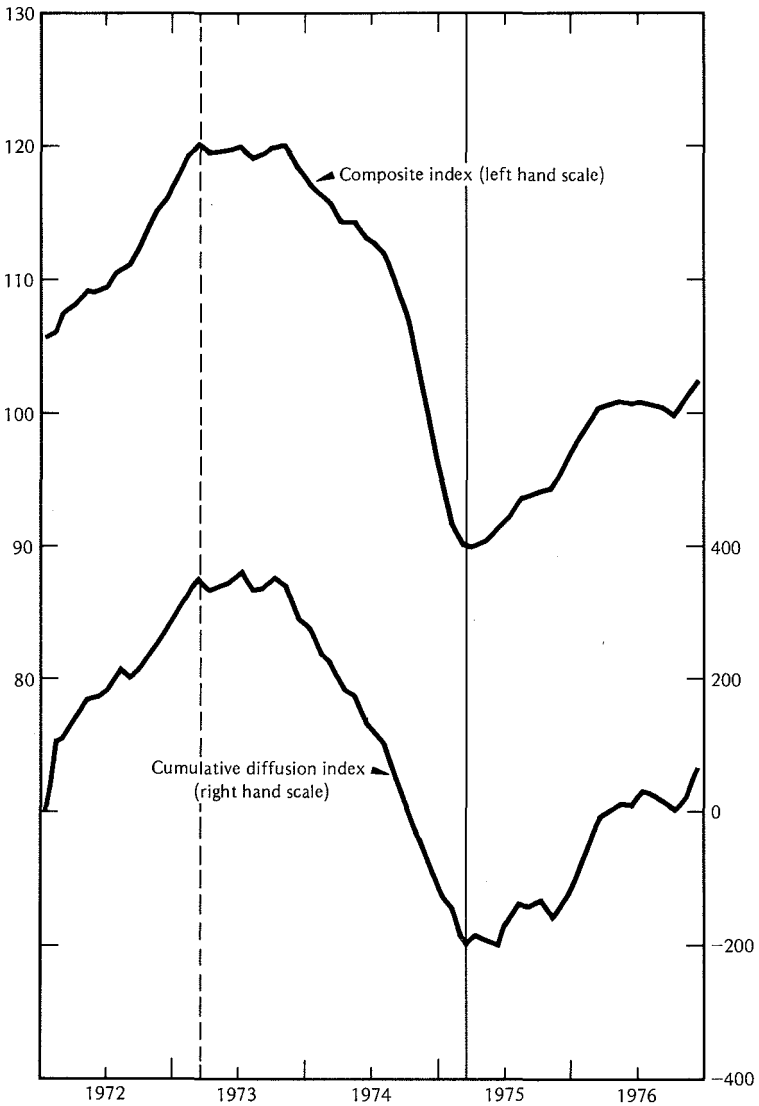
Diffusion indexes help to show when recessions in economic activity become widespread. We use them also, together with composite indexes, to summarize the evidence on the cyclical timing of the principal indicators of aggregate economic activity during 1973-1975 as it relates to the growth cycle downturn and upturn and to the business cycle peak and trough. The individual series used for this purpose, in seasonally adjusted form, are shown in Chart 1; the corresponding series of deviations from the trend estimates, in Chart 2. Composite indexes based on these series are computed by standardizing the monthly percent changes in the component series so as to prevent the more volatile series from dominating the index; averaging the standardized changes for the several components for each successive month; and cumulating the results into a monthly index. Diffusion indexes, based on the same series, show in cumulated form the excess of the percent of indicators expanding over the percent contracting, using cyclical peaks and troughs to define these phases.³² Both types of index are informative and in a sense complementary. A composite index has two distinguishing features as compared with a diffusion index: (i) it takes into account not just the direction, but the size, of changes in the series covered; (ii) it does not depend on the choice of specific peak and trough dates in the individual indicators. On the other hand, the diffusion index reflects the consensus of cyclical highs and lows in the indicators, ignoring most of the blips due to such things as unusual weather or strikes. It answers more directly the question, When did contraction become more widespread than expansion, or vice versa.

The composite index based on the deviations from trend of the eleven indicators in real terms listed in Table 1, lines 1-7, 9-12, reached a peak in March 1973 after a strong expansion that began in November 1970 (Chart 4). The index varied but little during the next nine months, marking the 1973 phase of low growth. Similarly, the historical cumulative diffusion index based on the same set of indicators reached a high plateau in March and remained substantially unchanged through most of the year. This reflects peaking of the trend-adjusted data early in 1973 in real income and sales, but late in 1973 in the employment series (Chart 2).

The detrended current-dollar indicators reached their peaks generally between August and November of 1973 (Table 1, lines 13-19), but this, of course, reflects the impact of inflation, which masked the slowdown in real growth during this period. In our judgment, based on the evidence in Table 1 and charts 2 and 4, the best choice for a reference date to mark the beginning of the slowdown (the peak of the growth cycle) is March 1973.

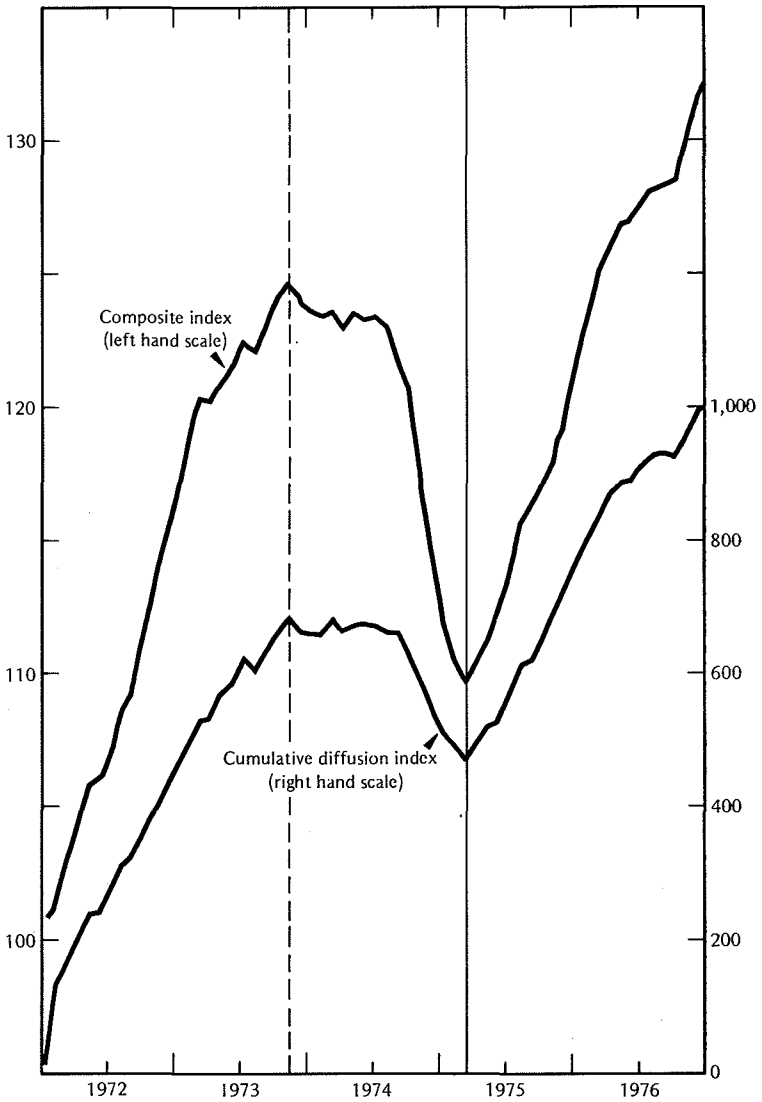
The indexes based on the series proper (i.e., without trend adjustment) point to November 1973 as the last month of business cycle expansion. The com-

CHART 4 Composite Index and Cumulative Diffusion Index of Deviations from Trend, Eleven Real Series, 1972-1976



posite index of the eleven real indicators reached its peak in that month and the cumulative diffusion index reached a high plateau (Chart 5).³³ November 1973 is also the median and, approximately, the mean month in the timing distribution of the specific peaks in this set of data. Most of the current-dollar indicators, propelled by inflation, had no specific-cycle contractions at all during this recession (Table 1, columns 2 and 3).³⁴ On the strength of the data pre-

CHART 5 Composite Index and Cumulative Diffusion Index of Original Data, Eleven Real Series, 1972-1976



sented in Table 1 and charts 1 and 4, we conclude that November 1973 is the appropriate choice for the peak date in the NBER business cycle chronology. The choice of March for the growth cycle peak and November for the business cycle peak is the same as that made in an earlier study on the basis of the more limited and more preliminary evidence then available (see Moore 1975).

A low-growth phase will start before the actual decline in general business activity if the economy grows at less than its long-term trend rate prior to the business cycle peak; this often happens and the 1973 developments illustrate it well. Such a phase need not encompass a business cycle contraction (recession) but, if it does, it cannot, of course, end before the contraction ends. It can, however, end later and will do so if the economy expands after the business cycle trough at a slower rate than that of the growth trend. Timing discrepancies of the latter sort are not very frequent and tend to be small in any event, because business expansions in their early (recovery) stages are often vigorous. In 1975 the troughs in the business cycle and the growth cycle were approximately synchronous.

Indeed, as shown in Table 1 (columns 3 and 4) and charts 1 and 2, most of the indicators of aggregate economic activity turned up in the short interval between February and June 1975, and so did the corresponding series of the deviations from trend. The business cycle trough is easy to date on the evidence of Table 1, column 3, and charts 1 and 5: the troughs in both the composite and cumulative diffusion indexes occur in March 1975 and the measures of central tendency derived from the timing distribution of the specific troughs confirm that choice. For the growth cycle upturn, a close reading of the evidence in Table 1, column 4, and charts 2 and 4 suggests that March, April, or May 1975 are possible choices, with little to choose among them. We have concluded that there is a slight preponderance of evidence in favor of March, the same month as the business cycle trough. What this means is that economic activity reached its lowest point in March, and that the rate of growth very quickly rose above the long-run trend rate.

Table 4 shows that in previous business cycles, as well as in 1973–1975, recession typically followed the onset of a low-growth phase, while recovery was approximately synchronous with the onset of a high-growth phase. (On three occasions since 1948—in 1951–1952, 1962–1964, and 1966–1967—low-growth phases interrupted business expansions but did not degenerate into business contractions.) The chronologies listed in the table will help identify the cyclical episodes that are included in the comparative analysis to follow.

[3] CYCLICAL MOVEMENTS DURING 1973–1976 IN HISTORICAL PERSPECTIVE

Business cycles cannot be reduced to any single dimension: they consist of numerous, diverse, and intricately connected processes shaped by many economic and other events. Business contractions have historically varied much in length, amplitude, and scope, and so have business expansions. These three criteria—duration, depth, and diffusion—can be used to compare cyclical

TABLE 4 Business Cycle Expansions and Contractions and High- and Low-Growth Phases in the United States, 1948-1975

Line	Business Cycle Reference Dates		Duration in Months		Growth Cycle Reference Dates		Duration in Months	
	Trough (T)	Peak (P)	Contraction (T from previous P)	Expansion (T to P)	Upturn (U)	Downturn (D)	Low-Growth Phase (D from previous U)	High-Growth Phase (U to D)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1		Nov. 1948				July 1948		
2	Oct. 1949		11		Oct. 1949	March 1951	15	17
3		July 1953		45	July 1952	March 1953	16	8
4	May 1954	Aug. 1957	10	39	Aug. 1954	Feb. 1957	17	30
5	April 1958	April 1960	8	24	April 1958	Feb. 1960	14	22
6	Feb. 1961		10		Feb. 1961	May 1962	12	15
7					Oct. 1964	June 1966	29	20
8		Dec. 1969		106	Oct. 1967	March 1969	16	17
9	Nov. 1970	Nov. 1973	11	36	Nov. 1970	March 1973	20	28
10	March 1975		16		March 1975		24	
11	Average		11	50	Average		18	20

SOURCE: National Bureau of Economic Research, Inc.

movements. They refer to distinct, although not independent, aspects of cyclical movement. Each is important, and each can be measured *ex post* in reasonably objective and accurate ways. Cyclical movements can also be compared in detail as they proceed by computing cyclical patterns for different economic indicators, starting from business cycle peaks or troughs and moving forward month by month or quarter by quarter. The similarities or differences between current developments and those at corresponding stages of earlier business cycles can be readily examined by this device. In the next section we compare the 1973-1975 recession with its predecessors in terms of duration, depth, and diffusion. In the following section, we take up the comparison of both the recession and the ensuing recovery in terms of cyclical patterns.

Duration, Depth, and Diffusion of Recessions

Table 5, based on the revised and updated business cycle chronology of the National Bureau, shows that the 1973-1975 recession lasted sixteen months, while the five earlier recessions since the end of World War II lasted from eight to eleven months (line 1). However, different durations and ranks are obtained depending on which individual series or indexes are used, partly because of systematic differences in the cyclical timing of economic processes and partly because of random influences and measurement errors involved in the determination of cyclical turning points. Contractions in the principal indicators of income, sales, production, and employment generally overlap in each recession, but they are not exactly coincident and indeed their durations vary considerably. The correlations between ranks based on the duration measures for the different series are in general positive but not high. Those between business cycle durations, on the one hand, and the index of coincident indicators, real GNP, and averages for thirteen selected indicators, on the other hand (lines 12-14 and 23) range from 0.5 to 0.7.³⁵ The ranks for the employment series (lines 18, 19, 22) are substantially different and show either no correlations or low negative correlations with the ranks based on the business cycle chronology.³⁶

That the consensus among the ranks for the five recessions of 1948-1970 is only moderate is not surprising, since these recessions have not varied much in duration according to the NBER chronology. On the other hand, all the measures in Table 5, except those derived from the industrial production, employment, and unemployment data, show the 1973-1975 recession to have been the longest since the end of World War II. Industrial production, as shown earlier, had a double-peak configuration in 1973-1974: it stopped rising in the autumn of 1973, though it did not definitely decline until almost a year later.

The exceptionally brief decline in employment (total employment declined for only eight months) was, at least in part, the consequence of the trend noted earlier. Declines in employment in the service industries have been brief-

TABLE 5 Ranking of Six Periods of Recession by Duration of Cyclical Decline, 1948-1975

Line	Peaks and Troughs of Business Cycle Contractions ^a						
	Nov. 1948 Oct. 1949 (1)	July 1953 May 1954 (2)	Aug. 1957 April 1958 (3)	April 1960 Feb. 1961 (4)	Dec. 1969 Nov. 1970 (5)	Nov. 1973 March 1975 (6)	
	Duration of Cyclical Decline, in Months ^b						
1	Business cycle chronology ^a	11	10	8	10	11	16
2	Index, 4 coincident indicators ^c	12	10	13	10	13	16
3	GNP in 1958 dollars (Q)	6	12	6	12	15	15
4	Personal income less transfers, 1967 dollars*	9	10	6	5	3	19
5	Mfg. & trade sales, 1967 dol- lars*	10	14	14	12	13	16
6	Retail sales, 1967 dollars	0 ^d	10	7	12	18	20
7	Industrial production index*	15	8	14	13	13	9
8	Total civilian employment	11	16	9	7	11	8
9	Employees on nonagr. payrolls*	13	16	14	10	8	9
10	Persons engaged in nonagr. ac- tivities, household survey	12	16	13	8	5	8
11	Unemployment rate	22	15	16	23	27	19

Ranking According to Duration of Cyclical Decline^a

12	Business cycle chronology ^a	4.5	2.5	1	2.5	4.5	6
13	Index, 4 coincident indicators ^c	3	1.5	4.5	1.5	4.5	6
14	GNP in 1958 dollars (Q)	1.5	3.5	1.5	3.5	5.5	5.5
15	Personal income less transfers, 1967 dollars*	4	5	3	2	1	6
16	Mfg. & trade sales, 1967 dol- lars*	1	4.5	4.5	2	3	6
17	Industrial production index*	6	1	5	3.5	3.5	2
18	Total civilian employment	4.5	6	3	1	4.5	2
19	Nonfarm employment, payroll survey*	4	6	5	3	1	2
20	Unemployment rate	4	1	2	5	6	3
21	5 deflated aggregates ^d	1	5	3	2	4	6
22	5 employment series ^e	4	6	5	2	3	1
23	13 indicators ^h	2	5	3.5	1	3.5	6

*Denotes series included in composite indexes, lines 2 and 13.

^aAccording to the revised NBER reference chronology. See accompanying text and Zarnowitz and Boschan (1975a).

^bMeasured from business cycle peak to business cycle trough (line 1) or from specific cycle peak to specific cycle trough (lines 2-10).

^cComposite of the four series marked by asterisks below, with fixed rates and standardization factors. See Zarnowitz and Boschan (1975c).

^dNo specific cycle contraction, or no decline at least five months long.

^eA rank of 1 means that the cyclical decline was the shortest of those observed for the six recessions covered; a rank of 6, that it was the longest. Ranks in lines 12-20 are based on the corresponding measures of duration in lines 1-5, 7-9, and 11.

^fRanks based on the averages of ranks of the following series: GNP in 1958 dollars (quarterly); final sales in 1958 dollars (quarterly); personal income less transfer payments, 1967 dollars; manufacturing and trade sales, 1967 dollars; and retail sales, 1967 dollars.

^gRanks based on the averages of ranks of the following series: total civilian employment (household survey); employees on nonagricultural payrolls (establishment survey); persons engaged in nonagricultural activities (household survey); employee hours in nonagricultural establishments; and percent employed, total population.

^hRanks based on the averages of ranks of the series listed in notes f and g above and of the industrial production index, total number of unemployed, and unemployment rate.

TABLE 6 Ranking of Six Periods of Recession According to Size of Specific Cycle Peak-to-Trough Percent Changes and Levels at Specific Troughs, Selected Indicators, 1948-1975

Line		Peaks and Troughs of Business Cycle Contractions ^a					
		Nov. 1948 Oct. 1949 (1)	July 1953 May 1954 (2)	Aug. 1957 April 1958 (3)	April 1960 Feb. 1961 (4)	Dec. 1969 Nov. 1970 (5)	Nov. 1973 March 1975 (6)
		Percent Change from Corresponding Specific Cycle Peak to Corresponding Specific Cycle Trough ^b					
1	Index, 4 coincident indicators ^c	-8.1	-8.0	-11.2	-4.6	-4.0	-12.5
2	GNP in 1972 dollars (Q)	-1.4	-3.3	-3.2	-1.2	-1.1	-6.6
3	Final sales, 1972 dollars (Q)	^d	-1.9	-1.7	^d	^d	-3.7
4	Personal income less transfers, 1972 dollars*	-3.7	-2.8	-3.0	-0.9	-1.1	-6.8
5	Mfg. and trade sales, 1967 dollars*	-1.1	-6.0	-9.4	-4.1	-4.4	-12.5
6	Retail sales, 1967 dollars	^d	-4.5	-4.5	-2.8	-1.4	-10.0
7	Industrial production index*	-10.1	-9.1	-13.5	-8.6	-6.8	-15.3
8	Total civilian employment	-2.4	-3.3	-2.3	-0.6	-0.3	-2.3
9	Employees on nonagricultural payrolls*	-4.2	-3.3	-4.2	-1.8	-1.1	-2.9
10	Persons engaged in non-agricultural activities	-3.3	-3.2	-1.9	-0.5	-0.4	-2.3
11	Employee hours in non-agricultural establishments	-5.8	-4.9	-5.4	-1.8	-2.2	-4.0
12	Total unemployed	+106.9	+132.4	+94.6	+41.6	+87.9	+88.8

13	Unemployment rate (% of labor force) ^a	+3.8	+3.4	+3.6	+1.9	+2.6	+3.9
14	Civilian employment, % of population ^e	-1.7	-2.5	-2.2	-1.1	-1.3	-2.2
15	Truck and rail traffic index	n.a.	n.a.	-11.0	-8.5	-5.3	-13.4
Levels at Corresponding Specific Cycle Troughs ^f							
16	Unemployment rate (% of labor force)	7.0	5.9	7.4	7.0	6.0	8.7
17	Civilian employment, % of population	54.5	53.5	54.0	54.1	55.4	55.2
18	Gap—potential less actual GNP (Q), %	n.a.	4.1	7.8	7.5	6.1	14.2
Ranking According to Size of Percent Decline during Specific Cycle Contractions ^g							
19	Index, 4 coincident indicators ^c	4	3	5	2	1	6
20	GNP in 1972 dollars (Q)	3	5	4	2	1	6
21	Personal income less transfers, 1972 dollars [*]	5	3	4	1	2	6
22	Mfg. and trade sales, 1967 dollars [*]	1	4	5	2	3	6
23	Retail sales, 1967 dollars	1	4 1/2	4 1/2	3	2	6
24	Industrial production index [*]	4	3	5	2	1	6
25	Total civilian employment	5	6	3 1/2	2	1	3 1/2
26	Employees on nonagricultural payrolls [*]	5 1/2	4	5 1/2	2	1	3
27	Persons engaged in non-agricultural activities	6	5	3	2	1	4

TABLE 6 Concluded

Line		Peaks and Troughs of Business Cycle Contractions ^a					
		Nov. 1948 Oct. 1949 (1)	July 1953 May 1954 (2)	Aug. 1957 April 1958 (3)	April 1960 Feb. 1961 (4)	Dec. 1969 Nov. 1970 (5)	Nov. 1973 March 1975 (6)
28	Employee hours in non-agricultural establishments	6	4	5	1	2	3
29	Unemployment rate ^b	5	3	4	1	2	6
30	Civilian employment, % of population	3	6	4 1/2	1	2	4 1/2
31	5 deflated aggregates ^c	3	4 1/2	4 1/2	1 1/2	1 1/2	6
32	5 employment series ^d	6	5	4	2	1	3
33	13 indicators ^e	3	5	4	1 1/2	1 1/2	6
		Ranking According to Levels at Corresponding Specific Cycle Troughs ^f					
34	Unemployment rate	3 1/2	1	5	3 1/2	2	6
35	Civilian employment, % of population	3	6	5	4	1	2
36	Gap—potential less actual GNP (Q), %	n.a.	1	4	3	2	5

n.a. = not available

^{a,c,d} Same as in Table 5.

^b Based on three-month averages centered on the months of specific cycle peaks and troughs.

^c Differences rather than percent changes are shown for this series.

^d Three-month averages centered on the months of specific cycle troughs.

^e A rank of 1 means that the cyclical decline is the smallest of those observed for the six recessions covered; a rank of 6, that it is the largest. Ranks are based on the corresponding entries in lines 1, 2, 4-11, 13, and 14.

^f Ranked from the smallest to the largest rise in unemployment rate (see line 13).

^{g,h,k} Same as notes f, g, and h, respectively, in Table 5.

ⁱ Line 34 is based on the corresponding entries in lines 16 and 18, ranked from lowest to highest; and line 35, on the entries in line 17, ranked from highest to lowest.

er and milder than in goods-producing industries. Since the former have also been growing much faster (service industries' employment doubled between 1948 and 1973; goods industries' employment rose by only one-third), their behavior now has a larger influence on total employment than it used to, and has tended to reduce the length of its decline. As a result, the rank correlation between the length of declines in employment and their order in time is -0.8 . Declines in employment have been getting shorter. Unfortunately, this tendency has not carried over to unemployment, or at least has been offset by opposite tendencies. Increases in unemployment during recessions have, if anything, been getting longer rather than shorter.

Business cycle contractions have been shorter (and expansions longer) in the past quarter century than they used to be in the long perspective of history. The NBER reference chronology for the U.S. economy, which starts on a monthly basis in 1854, covers twenty-two contractions in the period ending in 1945, and their average length was 21 months. More than half of them exceeded 16 months, the length of the 1973-1975 contraction, and the two longest lasted 65 months (October 1873-March 1879) and 43 months (August 1929-March 1933). The 1973-1975 recession, though long in terms of recent experience, was of less than average length when compared with *all* previous U.S. recessions on record. The mean duration of the twenty-seven contractions, 1857-1970, was 19 months.

Measures of the relative depth of business contractions are provided by the percent changes from peak to trough of the corresponding specific cycles in selected series (Table 6, lines 1-15).³⁷ For each indicator, these figures are ranked by absolute size from the smallest (rank 1) to the largest (rank 6). The ranks are listed in lines 19-30. For the sets of series (lines 31-33), we ranked the average ranks of the components. In addition, the lowest (specific trough) values in each of the recessions are recorded and ranked for the unemployment rate, percent of population employed, and GNP gap (lines 16-18 and 33-35). In these instances the absolute level of the indicator at the trough is of interest as a measure of the depth of recession.

The relative amplitude measures in Table 6, lines 1-15, suggest that the recessions of 1960-1961 and 1969-1970 can be grouped together as the mildest of the lot. The three earlier post-World War II recessions, which were definitely more severe, form another group. The 1973-1975 business contraction was, by most measurements, the deepest of the six episodes covered, followed by 1957-1958, 1953-1954, and 1948-1949. However, this conclusion must be qualified in some important respects. Although the deflated aggregates show much larger cyclical declines in 1973-1975 than during the other recessions, the series in physical units display no such sharp and regular contrasts. Indeed, in terms of employment the last recession must be judged milder than any of the three recessions between 1948 and 1958 (lines 8-12, 14, and 17).

The several rankings in Table 6, lines 19–35, are positively correlated with one another, often closely. Thus the ranks based on the coincident index have correlations ranging between 0.81 and 1.00 vis-à-vis ranks based on real GNP, real personal income less transfer payments, industrial production, the unemployment rate, the average of the five deflated aggregates, and the average of thirteen indicators. The corresponding rank correlations with the other indicators listed in Table 6 vary between 0.60 and 0.77, except for some of those involving employment (lines 26, 27, 31, and 34), which vary between 0.14 and 0.54. The overall extent of agreement among the rankings, measured on a scale ranging from zero (complete randomness) to 1 (perfect consistency, i.e., identical ranks), is 0.63 for lines 19–33 or 0.56 for lines 19–35.³⁸

The divergence between the employment indicators and the other series appears to reflect the trend mentioned above. According to the employment series, declines have been becoming both smaller and shorter since 1948. When the ranks of the six contractions are correlated with their order in time, the coefficient for total civilian employment is -0.83 , and those for nonfarm employment and employee hours range from -0.66 to -0.73 . In contrast, the corresponding correlations for industrial production and real GNP are virtually nil ($+0.04$ and $+0.03$, respectively). Declines in unemployment also fail to show a trend; the correlation is -0.03 .

One significant implication of the difference between the results for employment and unemployment is that job losing has become a smaller factor in the rise in unemployment during recessions. The relative effect of job losing on the unemployment rate can be measured approximately in the following manner. The change in the unemployment rate is roughly equal to the difference between the percent change in the labor force and the percent change in employment. During the first three postwar recessions (1948–1949, 1953–1954, and 1957–1958) the decline in employment (net loss of jobs) exceeded the rise in the labor force (net new entrants); during the last three (1960–1961, 1969–1970, and 1974–1975) the rise in the labor force exceeded the decline in employment, that is, while the declines in employment became smaller, the increases in the labor force became larger. The unemployment problem in recessions has become less a matter of job losing and more a matter of finding jobs for new entrants into the labor force. The acceleration in the growth of the labor force, in turn, has been primarily a consequence of accelerated growth in the size of the working age population; the rise in the overall labor force participation rate has been a minor factor. The story is told in Table 7.

More dramatic than the percentages shown in the table are the numbers of persons involved. During the first three recessions the number of unemployed rose in the aggregate by 4.8 million, with 2.8 million accounted for by reductions in the number employed and 2.0 million, by increases in the labor force. During the last three recessions the number of unemployed rose by 4.5 million, but reductions in employment accounted for only 0.7 million and increases in

**TABLE 7 Relative Importance of Job Loss in Changes in Unemployment, 1948-1949 to 1974-1975
(annual data)**

	Percent Change in			Change in Labor Force Minus Change in Employment (4)	Change in Unemployment Rate (5)	Percent Accounted for by Job Loss ^a (6)
	Noninst. Population (1)	Civilian Labor Force (2)	Civilian Employment (3)			
1948-1949	+1.0	+1.1	-1.2	+2.3	+2.1	52
1953-1954	+1.0	+1.0	-1.8	+2.8	+2.6	64
1957-1958	+1.1	+1.1	-1.6	+2.7	+2.5	59
1960-1961	+1.3	+1.2	0.0	+1.2	+1.2	0
1969-1970	+1.7	+2.5	+0.9	+1.6	+1.4	-64
1974-1975	+1.7	+1.8	-1.3	+3.1	+2.9	42

^aColumn 3, signs reversed, divided by column 4, times 100.

TABLE 8 Ranking of Six Periods of Recession According to Size of Business Cycle Peak-to-Trough Percent Changes and Levels at Business Troughs, Selected Indicators, 1948-1975

Line		Peaks and Troughs of Business Cycle Contractions ^a					
		Nov. 1948 Oct. 1949 (1)	July 1953 May 1954 (2)	Aug. 1957 April 1958 (3)	April 1960 Feb. 1961 (4)	Dec. 1969 Nov. 1970 (5)	Nov. 1973 March 1975 (6)
		Percent Change from Business Cycle Peak to Business Cycle Trough ^b					
1	Index, 4 coincident indicators ^c	-7.8	-8.0	-10.8	-4.6	-3.2	-12.5
2	GNP in 1972 dollars (Q)	-1.4	-2.7	-2.5	-0.3	-0.6	-6.6
3	Final sales, 1972 dollars (Q)	+1.3	-1.8	-1.1	+0.9	-0.2	-3.2
4	Personal income less transfers, 1972 dollars*	-2.8	-2.5	-3.0	-0.2	-0.1	-6.9
5	Mfg. and trade sales, 1967 dol- lars*	-1.3	-5.0	-7.6	-3.6	-2.9	-12.5
6	Retail sales, 1967 dollars	+1.4 ^d	-0.5	-4.5	-2.8	+0.6	-5.7
7	Industrial production index*	-8.5	-9.1	-12.6	-6.1	-5.8	-15.1
8	Total civilian employment	-1.5	-2.2	-2.3	+0.3	-0.2	-1.4
9	Employees on nonagricultural payrolls*	-4.1	-2.9	-3.8	-1.8	-0.9	-1.7
10	Persons engaged in non- agricultural activities	-0.7	-2.2	-1.8	0.0	-0.1	-1.2
11	Employee hours in non- agricultural establishments	-5.2	-3.9	-4.8	-1.9	-2.2	-3.6
12	Total unemployed, civilian labor force	+85.9	+124.4	+71.2	+31.5	+62.8	+78.1

13	Unemployment rate, total ^e	+3.1	+3.2	+2.9	+1.6	+2.2	+3.5
14	Civilian employment, % of population ^e	-1.3	-1.7	-1.7	-0.5	-1.0	-2.1
15	Truck and rail traffic index	n.a.	n.a.	-10.0	-6.4	-1.6	-13.4

Levels at Business Cycle Troughs^f

16	Unemployment rate, total	7.0	5.8	7.2	6.8	5.9	8.4
17	Civilian employment, % of population	54.5	53.8	54.1	54.4	55.7	55.2
18	Gap — potential less actual GNP (Q), %	n.a.	4.1	7.8	7.5	6.1	14.1

Ranking According to Size of Percent Decline during
Business Cycle Contractions^g

519	19	Index, 4 coincident indicators ^c	3	4	5	2	1	6
	20	GNP in 1972 dollars (Q)	3	5	4	1	2	6
	21	Personal income less transfers, 1972 dollars*	4	3	5	2	1	6
	22	Mfg. and trade sales, 1967 dol- lars*	1	4	5	3	2	6
	23	Retail sales 1967 dollars	1	3	5	4	2	6
	24	Industrial production index*	3	4	5	2	1	6
	25	Total civilian employment	4	5	6	1	2	3
	26	Employees on nonagricultural payrolls*	6	4	5	3	1	2
	27	Persons engaged in non- agricultural activities	3	6	5	1	2	4
	28	Employee hours in non- agricultural establishments	6	4	5	1	2	3

TABLE 8 Concluded

		Peaks and Troughs of Business Cycle Contractions ^a					
Line		Nov. 1948	July 1953	Aug. 1957	April 1960	Dec. 1969	Nov. 1973
		Oct. 1949 (1)	May 1954 (2)	April 1958 (3)	Feb. 1961 (4)	Nov. 1970 (5)	March 1975 (6)
29	Unemployment rate ^h	4	5	3	1	2	6
30	Civilian employment, % of population	3	4 1/2	4 1/2	1	2	6
31	5 deflated aggregates ⁱ	1 1/2	4	5	3	1 1/2	6
32	5 employment series ^j	4	5	6	1	2	3
33	13 indicators ^k	3	4	5	1	2	6
Ranking According to Levels at Business Cycle Troughs ^l							
34	Unemployment rate	4	1	5	3	2	6
35	Civilian employment, % of population	3	6	5	4	1	2
36	Gap—potential less actual GNP	n.a.	1	4	3	2	5

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n.a. = not available.

^aDenotes series included in composite indexes, lines 1 and 19.

^{a,c,d}Same as in Table 5.

^bBased on three-month averages centered on the months of business cycle peaks and troughs.

^{e,g,h}Same as in Table 6.

ⁱThree-month averages centered on the months of business cycle troughs.

^{j,k}Same as notes f, g, and h, respectively, in Table 5.

^lSame as in Table 6.

the labor force, for 3.8 million.

The measures in Table 6 reflect the relative amplitudes of specific cycle movements associated with business recessions. The results give full recognition to the timing differences among the indicators and measure the full cyclical swing in each indicator. In Table 8 we compare the size of movements that occurred strictly during the period of each recession, that is, the relative changes between the business cycle, rather than the corresponding specific cycle, turning points. The percent change figures in Table 8 equal their counterparts in Table 6 whenever the specific cycle turns in the given series coincide with the business cycle turns, but this happens only about 15 percent of the time. Otherwise, the amplitude measures in Table 8 are smaller in absolute terms than the corresponding entries in Table 6, but the differences are often minor.

The correlations among the rankings in Table 8, lines 19-35, are positive and in many cases quite high. Specifically, choosing once again the coincident index as the reference series, we find that its ranks are exactly the same as those of the industrial production index and closely correlated ($r_s \geq 0.9$) with the ranks of real GNP, real personal income, the percent of population employed, and the groups of five deflated aggregates and thirteen indicators. The corresponding correlations with the real sales aggregates, total nonfarm employment, and the unemployment rate vary between 0.71 and 0.83; those with the other employment and unemployment series, between 0.26 and 0.66. The coefficients of concordance (W) are 0.63 (lines 19-33) and 0.57 (lines 19-35).³⁹

Since the amplitude measures in Table 8 use common fixed reference periods for the business recessions being compared, they are presumably less affected by the dispersion of cyclical timing of the different series than are the amplitude measures in Table 6 which relate to complete specific cycle contractions that vary in duration for each recession they match. As seen in Table 5, the rankings of the duration figures show some large disparities. Consequently, one might expect a closer agreement among the reference cycle than among the specific cycle measures of the relative depth of business recessions. In fact, the rank correlations based on changes between business cycle turns (Table 8) are mostly higher than those based on changes between specific cycle turns (Table 6), but on balance the difference between the two sets is small.

Averages of the ranks in both tables indicate that the six business recessions can be arrayed in the following order from mildest to most severe: 1969-1970, 1960-1961, 1948-1949, 1953-1954, 1957-1958, and 1973-1975. However, some of the distinctions involved are marginal and based on partly conflicting evidence; e.g., while the 1960-1961 and 1969-1970 recessions were definitely milder than the rest, it is difficult to establish firmly their relative position vis-à-vis one another. Also, it should be noted that our amplitude measures are not adjusted for any special events that occurred in the vicinity of business cycle

turning points (except inasmuch as our use of the three-month averages at peaks and troughs reduces the influence of such events). It is difficult to identify such factors and eliminate their effects, and attempts to do so may well result in a net increase rather than reduction of measurement error. This applies, in particular, to the two events that are known to have coincided with reference turns: the major strikes of October 1949 and November 1970. A simple adjustment—excluding the strike months from the data—has serious disadvantages and, in any event, would not significantly alter our conclusions.⁴⁰

The larger a cyclical movement (expansion or contraction), the more widespread it usually is, and vice versa. Thus a diffusion index, which shows monthly the percent of components of an economic aggregate that are expanding, is as a rule positively correlated with the rate of change in the same aggregate. But the correlation can break down when, for example, there are sharp but localized changes in the activity, or when the changes are small but widespread. Moreover, a diffusion index can be computed for groups of series for which no aggregate exists. Hence, the size and scope of economic change are two distinct aspects worth studying both separately and jointly.

In the present context, diffusion indexes based on series with roughly coincident timing are of particular interest. The indexes for nonagricultural employment (30 and 172 industries) and industrial production (24 industries) record the percent of industries experiencing declining employment and output during each business contraction.⁴¹ The larger these proportions are, and the longer they persist, the greater the diffusion or scope of the contraction. In each of the six recessions of the post-World War II period, the percent of industries with falling employment (measured over six-month spans) reached 75 percent or more and stayed at these high levels for a number of months; at no other times during the period did this happen. Much the same statement can be made about the diffusion index for industrial production. Thus a good measure of the scope of a business contraction is the average percent declining (\bar{d}) over the interval during which that percent exceeded 75. In addition to \bar{d} , we also examine the *maximum* percent of industries declining during any month related to a given recession ($\max d$).

Table 9 shows that employment and production declines were least widespread in the recession of 1969–1970; that the recessions of 1960–1961 and 1953–1954 were about the same in scope; and that the recessions of 1973–1975, 1957–1958, and 1948–1949 were the most widely diffused. Very few industries were left unscathed by these recessions.

Patterns of Recession and Recovery

The course, speed, scope, and duration of contractions and expansions vary from one business cycle to another according to any acceptable measure of

economic activity. Moreover, different measures suggest different rates and patterns of cyclical change for any particular episode. Comparisons of developments during corresponding phases of general business fluctuations must therefore be designed and interpreted with great caution and respect for historical diversity. They are also rather severely limited by the availability of reasonably accurate data. Yet it is possible to make such comparisons for several important economic variables over a number of successive business cycles whose chronology is well established, and the results are instructive for both the regularities and irregularities they disclose.

Our analysis covers ten major economic indicators, goes back to the 1920s, and is divided into two sections. The first deals with developments before and during business contractions—specifically, the period beginning 12 months before and ending 18 months after each business cycle peak covered. The second deals with recoveries, and spans the period beginning 6 months before and ending 24 months after each business cycle trough covered.⁴²

Recession Patterns

In Chart 6 each of seven selected indicators is converted to a percent change from its level at the business cycle peak, so that the standings at peak form a common base (= 100) for a set of business contraction patterns. For each of four other indicators Chart 6 shows two analogous graphs using absolute differences instead of percent changes. Those series are the unemployment rate, the inflation rate (based on the consumer price index), change in business inventories in constant dollars, and interest rates on bank loans to business. All series covered are identified on the charts and in the descriptive notes below.

The data for the latest recession are plotted for each consecutive month or quarter, and so are the median patterns for the five business cycles 1948-1969. To avoid overly complicated graphs, the data for all individual cycles before the latest one are plotted only every six months. The 1948-1969 cycles are represented by dots, the earlier cycles by crosses.

GNP in Constant Dollars In the year before the peak and the first two quarters of the recession, the pattern for the past cycle deviates little from the median 1948-1969 pattern, but further on the differences widen, reflecting the greater severity and longer duration of the 1973 contraction (the dates used in this section refer throughout to the year in which the given cyclical movement began). The 1929 and 1937 contractions stand out clearly as the deepest ones; the former decline was initially smaller than the latter, but it accelerated sharply in its second year and lasted much longer.

Industrial Production Here the sharp decline during the 1973-1975 business contraction was relatively short and occurred late; hence, the deviations from the median pattern are large. Only four other declines were deeper and lasted at least as long: 1920, 1929, 1937, and 1945.

TABLE 9 Ranking of Six Periods of Recession by Diffusion of Cyclical Decline, 1948-1975

Line	Peaks and Troughs of Business Cycle Contractions ^a						
	Nov. 1948 Oct. 1949 (1)	July 1953 May 1954 (2)	Aug. 1957 April 1958 (3)	April 1960 Feb. 1961 (4)	Dec. 1969 Nov. 1970 (5)	Nov. 1973 March 1975 (6)	
	Average Percent of Industries Declining (\bar{d}) ^b						
	Employees on nonagricultural payrolls						
1	30 industries	83.3 (9)	82.0 (10)	83.6 (13)	80.0 (7)	77.1 (4)	85.5 (7)
2	172 industries	n.a.	n.a.	n.a.	78.1 (6)	77.2 (4)	83.7 (7)
	Industrial production						
3	24 industries	83.3 (7)	81.0 (7)	90.1 (8)	82.6 (6)	79.2 (1)	88.7 (7)
	Maximum Percent of Industries Declining (max d) ^c						
	Employees on nonagricultural payrolls						
4	30 industries	90.0	86.7	88.3	81.7	80.0	90.0
5	172 industries	n.a.	n.a.	n.a.	80.1	79.7	86.9
	Industrial production						
6	24 industries	91.7	91.7	97.9	91.7	79.7	91.7
	Ranking According to \bar{d} and max d						
	Employees on nonagricultural payrolls						
	30 industries						

7	\bar{d}	4	3	5	2	1	6
8	max d	5.5	3	4	2	1	5.5
172 industries							
9	\bar{d}	n.a.	n.a.	n.a.	2	1	3
10	max d	n.a.	n.a.	n.a.	2	1	3
Industrial production							
24 industries							
11	\bar{d}	4	2	6	3	1	5
12	max d	3.5	3.5	6	3.5	1	3.5

n.a. = not available.

^aSame as in Table 4.

^bFigures in parentheses show the number of consecutive months when 75 percent or more of industries were declining; the preceding \bar{d} is the actual average over those months. See text.

^cSee text.

CHART 6 Recession Patterns, Eleven Indicators

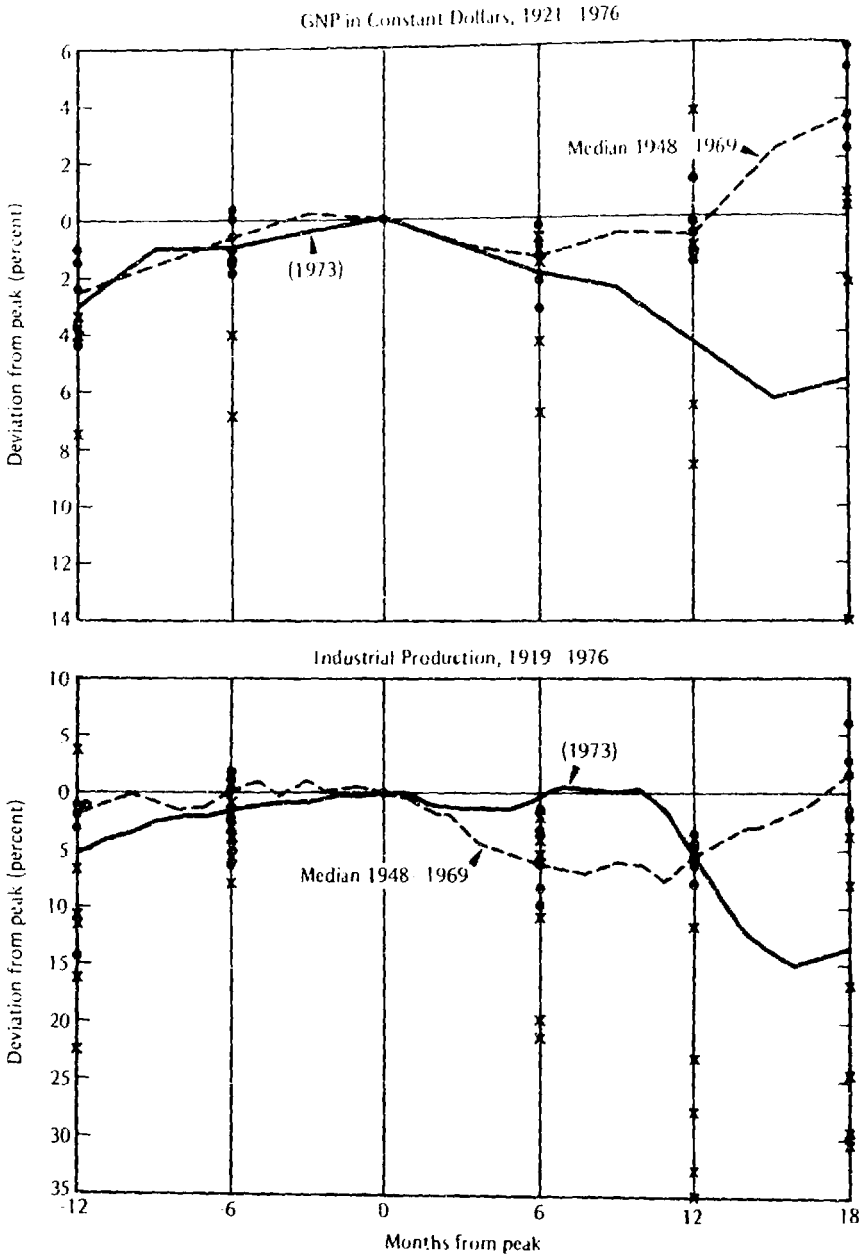
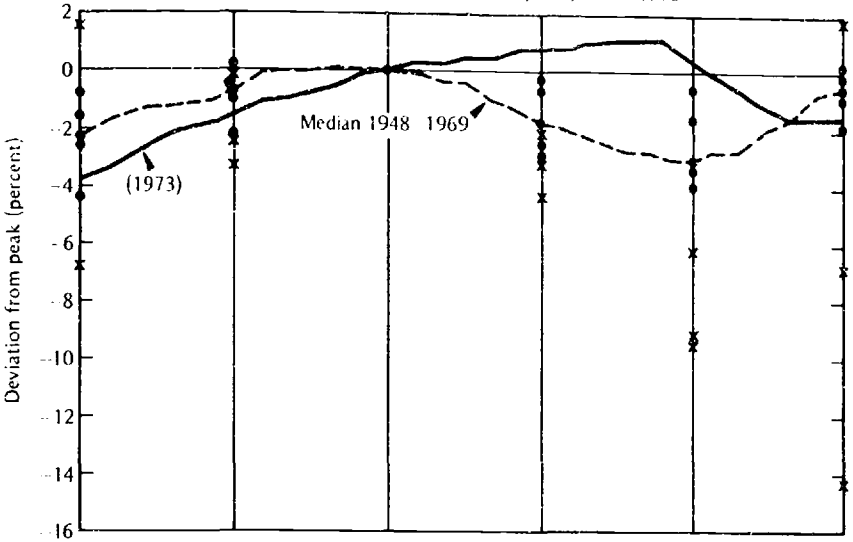


CHART 6 (continued)

Employees on Nonagricultural Payrolls, 1929-1976



Unemployment Rate, 1929-1976 (inverted scale)

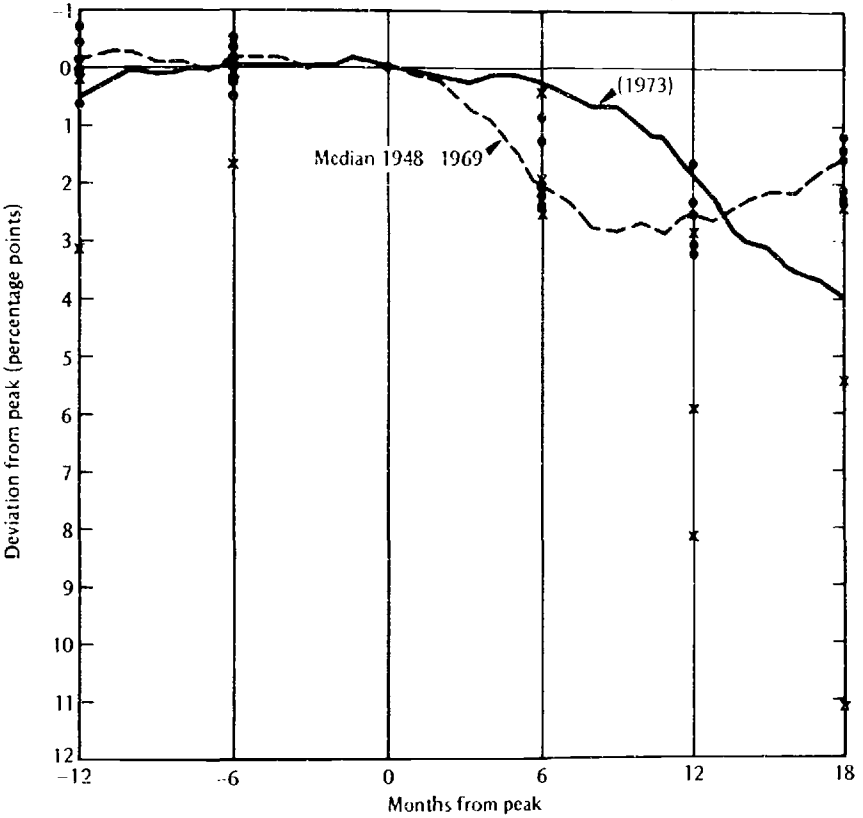
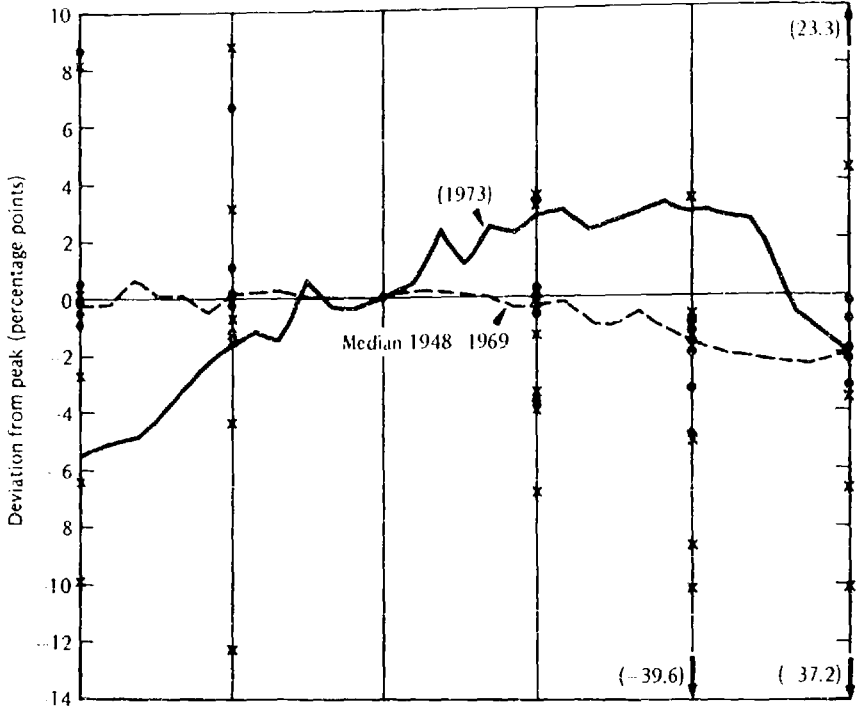


CHART 6 (continued)

Consumer Price Index, Six-month Change, at Annual Rate, 1920-1976



Sales from Retail Stores in Constant Dollars, 1919-1976

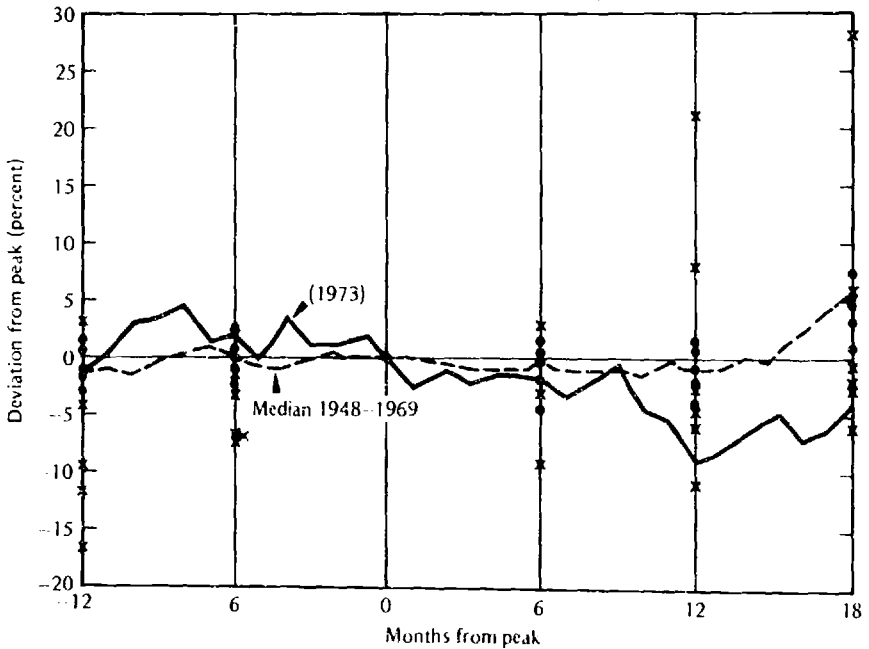


CHART 6 (continued)

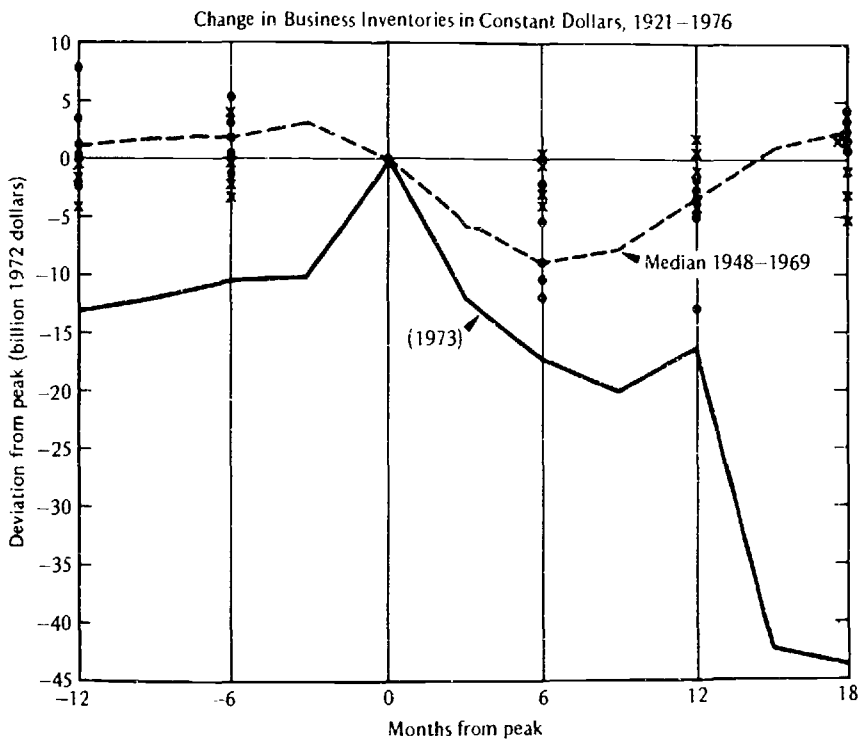
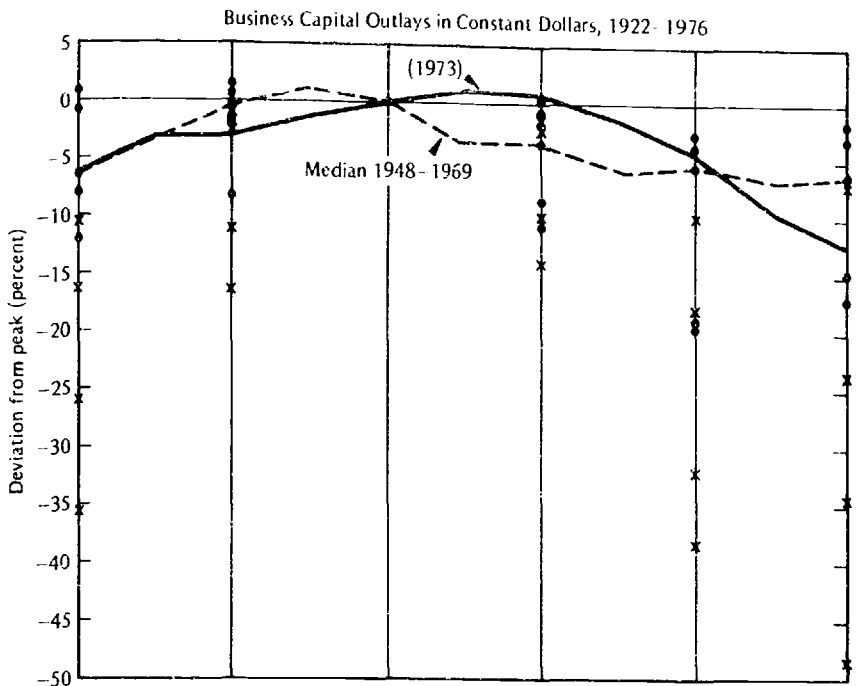
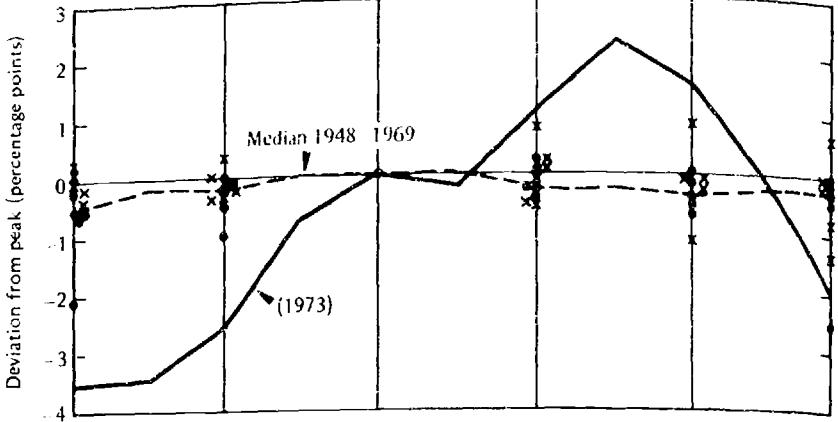


CHART 6 (continued)

Bank Rates on Short-Term Business Loans, 1919-1976



Corporate Profits in Constant Dollars, 1922-1976

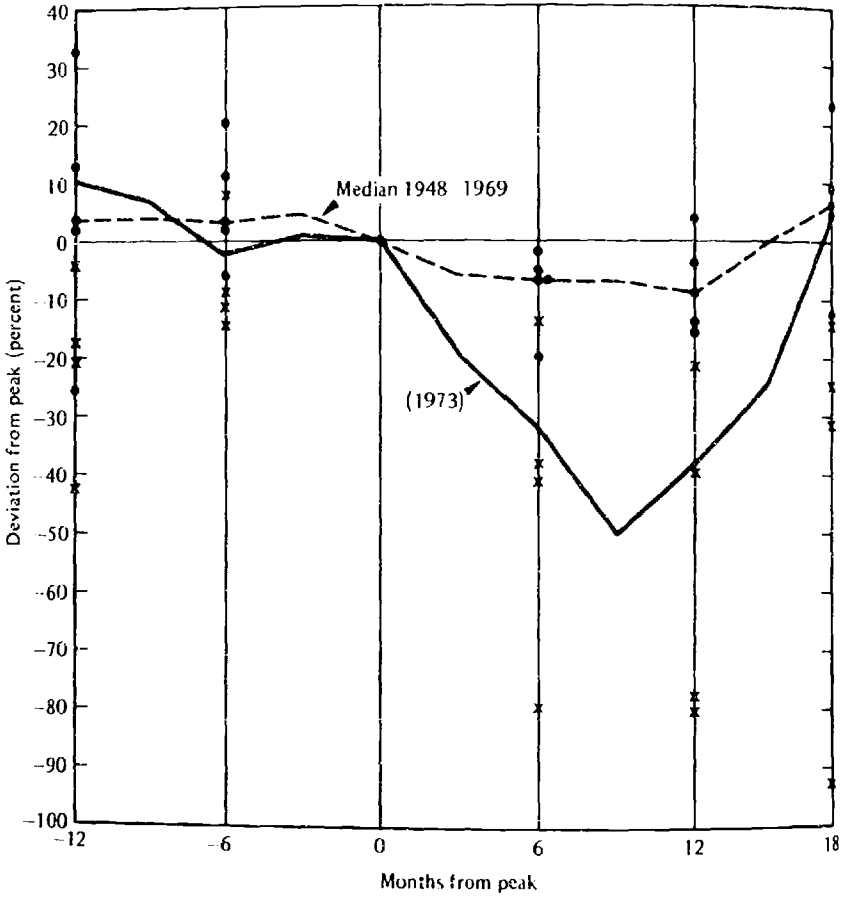
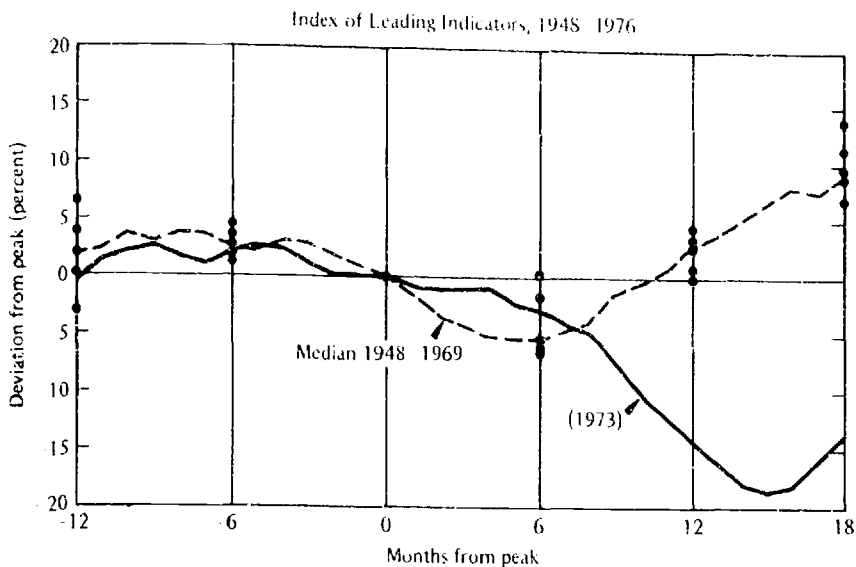


CHART 6 (concluded)



Employees on Nonagricultural Payrolls This series shows a larger and more continuous rise in 1973-1974 than the industrial production index, and a smaller decline in 1974-1975. This is partly due to the broader coverage of employment, which includes services. On the whole, however, the patterns for the two series are similar.

Unemployment Rate (inverted) Absolute changes in the percent of the labor force represented by the jobless have been quite small in the last year of expansion (except before the 1937 peak). During the first nine months after the peak, the rate of unemployment increased much more slowly in 1973-1974 than in the other contractions, but during the next nine months the situation was drastically reversed: the 1974-1975 rise in the jobless rate was larger than in any recession since 1940. However, it was clearly not caused by an unusually large decline in employment, since the latter, in fact, was relatively small.

Consumer Price Index The graph shows cyclical movements in the rate of inflation, which is represented by the percent change in the CPI over six-month spans at annual rates. Large cyclical declines in this measure mark several historical episodes, particularly the huge deflation of 1920-1921 and the smaller deflations following the business cycle peaks in 1929, 1937, and 1948. More recently, of course, upward trends have been predominant, but the chart shows that declines in the rate of inflation occurred in every recession between 1948 and 1969. In contrast, the pattern for 1973-1975 shows a sharp rise during most of the recession; only in the last six months of the recession did a substantial decline begin.

Sales of Retail Stores in Constant Dollars This series shows a long and sharp decline in 1973–1974, beginning well above and ending well below the median 1948–1969 pattern. Indeed, the decline was larger than in 1929–1931 and was exceeded only by the 1937–1938 contraction. However, the data before and after World War II are not strictly comparable.⁴³

Business Capital Outlays in Constant Dollars Real investment in plant and equipment declined late and at first slowly in 1974, holding up just about as well as it did in the mild 1970 recession. It was only in the second half of the recession that real capital spending by business fell at an accelerated rate. Although the decline then was large, it was no larger than in some of the earlier post-World War II contractions. Of course, nothing in the more recent U.S. economic history came even close to the catastrophic slumps of investment during the two contractions of the 1930s, as the chart shows.

Change in Business Inventories in Constant Dollars Unlike fixed investment, business inventory investment in real terms had a sharp downward trend throughout the 1973–1975 recession. Compared to the median pattern, 1948–1969, and to all the other episodes shown, the 1973–1975 decline was exceptionally large. Since the patterns are expressed in billions of dollars in constant prices, the growth of the economy needs to be taken into account in evaluating the differences between the earlier and later cycles.

Bank Rates on Short-Term Business Loans The 1973–1975 pattern shows by far the largest swing in interest rates on record, as indicated by the comparison with the median 1948–1969 pattern, which lies close to the base line, and by the similar concentration of most entries for the individual cycles. However, the cyclical movements of bank rates were also large in 1969–1971. Clearly, interest rates have varied much more widely during the past decade than in earlier times.

The average of interest rates charged by banks on commercial loans is a lagging indicator, especially at troughs. In 1974 the lag at the business peak was particularly pronounced and very similar to the lag in the inflation rate. Indeed, a comparison of this graph with that for the rate of change in the CPI reveals a striking parallelism of the 1973 patterns as well as some more minor similarities for the earlier cycles (including the 1948–1969 averages). This positive association has a familiar twofold theoretical explanation: (i) The observed (nominal) market interest rates tend to increase (decrease) in times when inflation (deflation) is anticipated. To the extent that lenders and borrowers agree on the expected rate of increase in prices, they are also apt to agree on the corresponding inflation premium to be included in the interest rates. (ii) The expected rate of change in prices is positively related to the observed path of actual rates of change in the price level.

As noted before, however, price expectations adjusted to the large swing in the inflation rates only with a lag and incompletely, that is, much of the inflation was unanticipated. The amplitude of the interest rate pattern is consider-

ably smaller than that of the inflation pattern. Furthermore, bank interest rates (and rates of return in general) have other determinants as well: they would vary even if no change in the inflation rate were expected. Thus interest rates rose to high peak levels in the first three quarters of 1974 partly because business investment in current dollars continued strong and so, consequently, did the overall demand for credit.

Corporate Profits in Constant Dollars In an attempt to measure cyclical changes in real profits, we use the latest data on corporate profits from production (i.e., with inventory valuation and capital consumption adjustments) deflated by the GNP implicit price index.⁴⁴ The decline in profits so measured started early—a year before the reference peak date of 1973:4—but was initially slow and vacillating. In 1974, however, real profits slumped sharply, much as they did in 1923-1924 and far worse than in the other contractions covered except for the debacles of the 1930s.

Index of Leading Indicators The decline in this series started five months before the November 1973 business cycle peak, a shorter lead than that indicated by the median 1948-1969 pattern. For about a year thereafter, the movement of the index was close to the median, but then the pattern for 1974-1975 shows an accelerated decline which is in sharp contrast to the rise in the median pattern. In terms of these comparisons, it is evident that the 1973-1975 contraction in the leading indicators was both relatively long and deep.

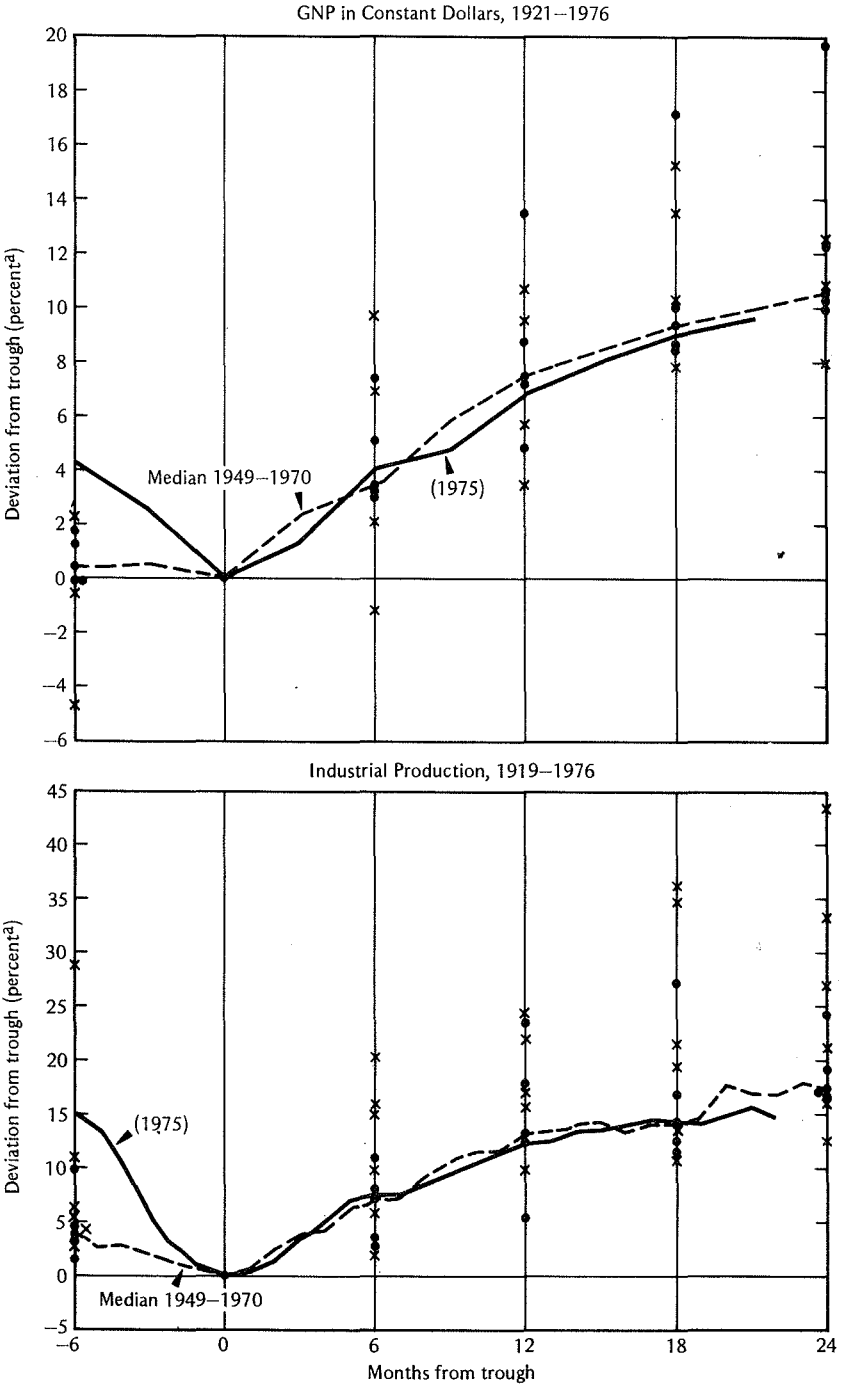
Recovery Patterns

Chart 7 is analogous in form and content to Chart 6, but it is designed to show the behavior of the same series immediately before and during the business recoveries. It should be noted that the data plotted for most series start from a zero base line at the business cycle trough, and show changes from that trough level computed as a percent of the level at the preceding business cycle peak. The reason is that percents computed in the usual way, with the trough level as the base, are apt to be very large if the trough is very low. For this arithmetic reason alone, deep recessions are apt to be followed by "rapid" recoveries. Moreover, since there is great variation in the depth of recessions but less variation in the height of booms, greater comparability among recoveries is achieved by using the peak level as the base for calculating percent change during recovery.⁴⁵ The same data can be used to show how far below or above the preceding peak level the indicator stands at any given point during the recovery by comparing the rise after the trough with the preceding decline from peak to trough. The charts as plotted, however, do not show this.

The following observations sum up the main lessons from this graphical analysis.

GNP in Constant Dollars The path of this series in the current recovery re-

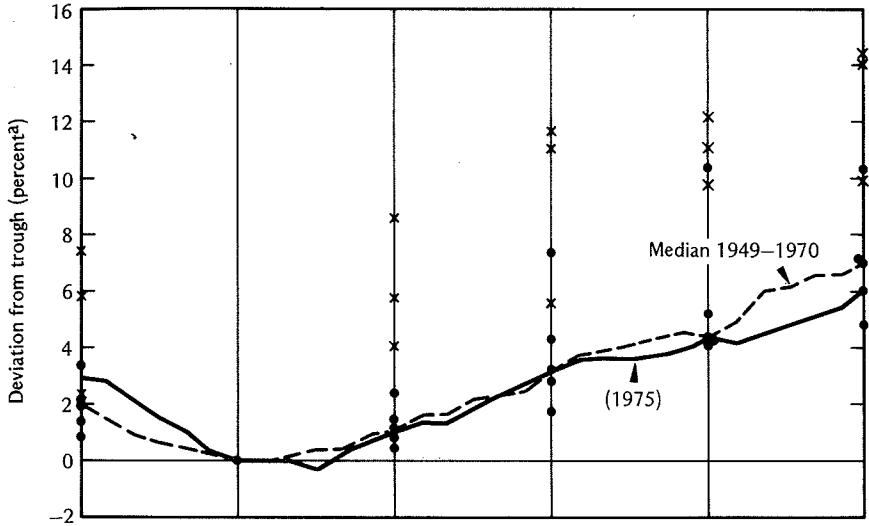
CHART 7 Recovery Patterns, Eleven Indicators



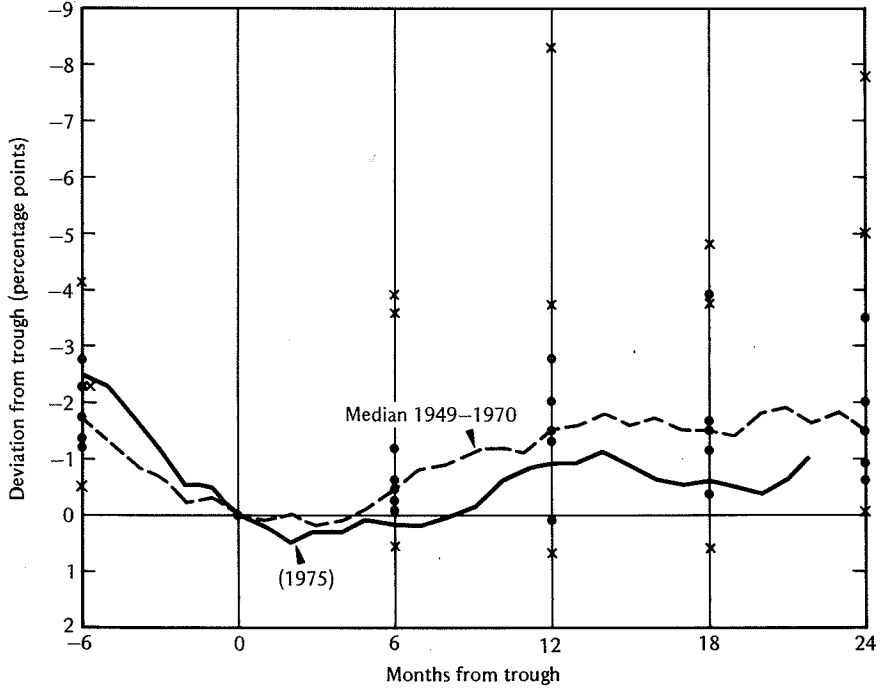
^aOn base of preceding peak.

CHART 7 (continued)

Employees on Nonagricultural Payrolls, 1929-1976

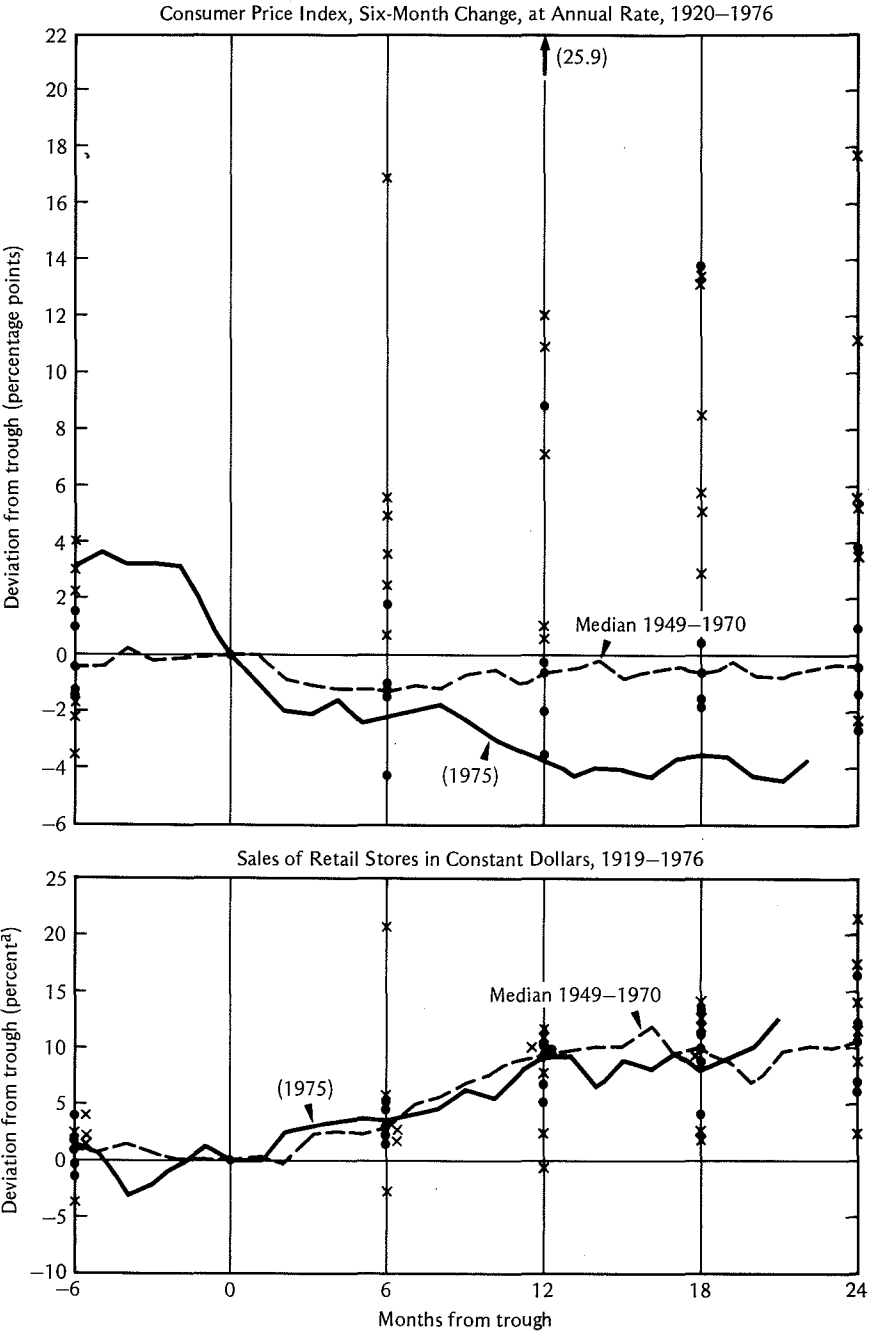


Unemployment Rate, 1929-1976 (inverted scale)



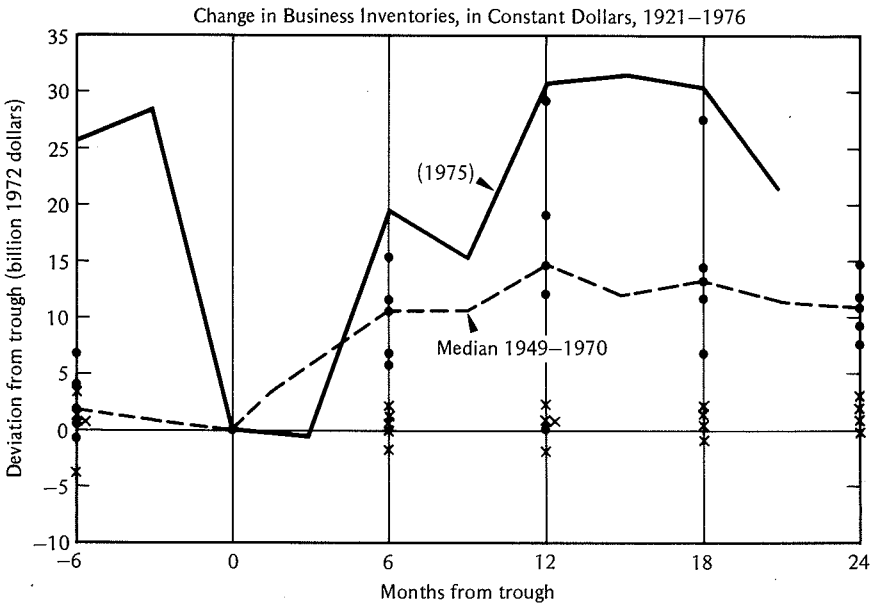
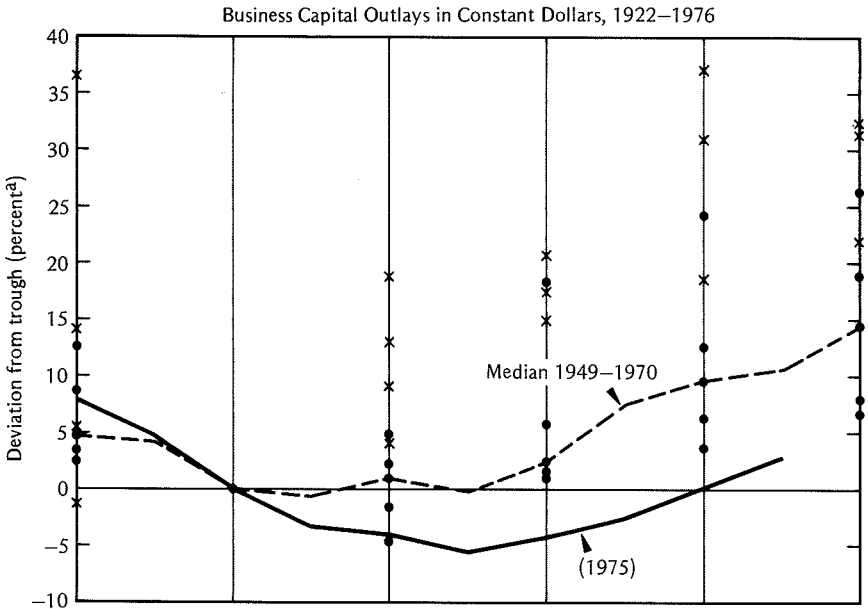
²On base of preceding peak.

CHART 7 (continued)



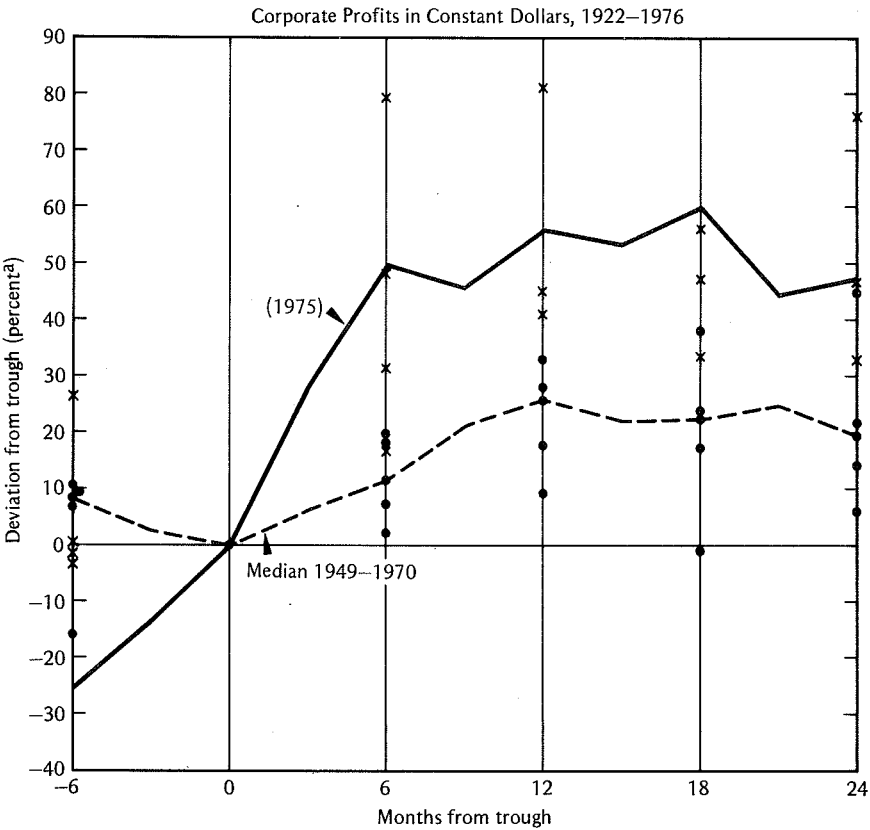
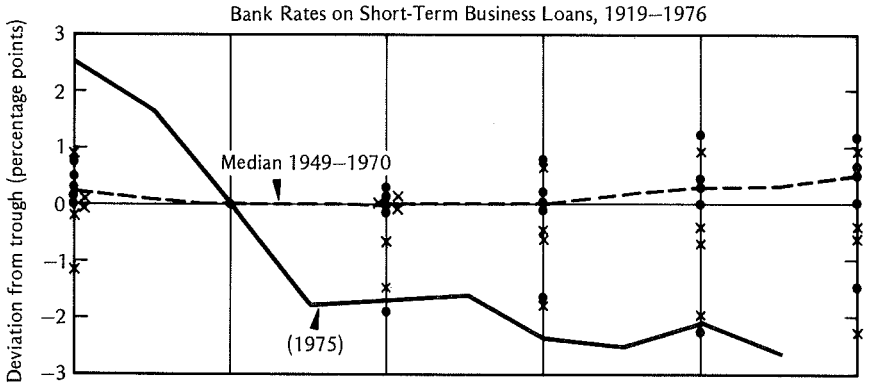
^aOn base of preceding peak.

CHART 7 (continued)



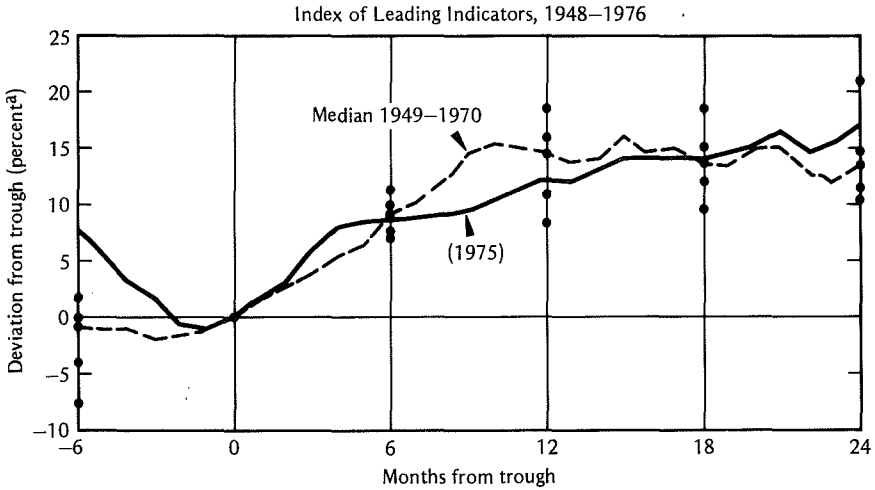
²On base of preceding peak.

CHART 7 (continued)



^aOn base of preceding peak.

CHART 7 (concluded)



^aOn base of preceding peak.

sembles closely but is slightly below the average 1949-1970 expansion pattern. The most rapid recoveries followed the 1938 and 1949 recessions, stimulated in part by World War II and the Korean War. The recovery from the 1933 depression was the slowest, and initially the recovery from the 1970 recession was relatively slow.

Industrial Production The configuration for the 1975 recovery resembles broadly that of real GNP and leads to the same conclusion: that the expansion in industrial production in its first two years has lagged slightly behind the majority of its historical counterparts. However, the 1975-1976 curve lies very close to the median pattern.

Employees on Nonagricultural Payrolls The 1975 recovery pattern for employment shows a later upturn and a somewhat slower rise during the first two years than the median pattern. It is consistent with the image of a relatively moderate but steady rise in economic activity.

Unemployment Rate (inverted) The reduction in the unemployment rate has been significantly slower in 1975-1976 than in the previous recoveries covered, except for 1970 and 1945-1946—which, however, was in many respects a very special episode. The slow reduction in unemployment during the first year of the recovery cannot be attributed to a slow rise in employment, since the rise in employment was then close to the average of previous recoveries. Rather, it reflects the continuing, unusually strong growth of the labor force and the concentration of employment gains in service industries where, as noted before, labor turnover rates tend to be especially high. The turnaround to higher unemployment rates during the "pause" in the second half of 1976 has been relatively pronounced, though not without some precedents in past expansions.

TABLE 10 Economic Growth Rates and Changes in the Rate of Inflation during First Eighteen Months of Recoveries, 1921-1976

Line	Business Cycle Recovery Starting in	Growth Rate in Real GNP ^a during First 18 Months (% per year) (1)	Percent Rate of Change in Consumer Price Index ^b		Change in Rate of Inflation (% points) (4)
			At Start of Recovery (2)	18 Months Later (3)	
1	March 1933	5.2	-9.5	3.9	13.4
2	April 1958	5.6	4.1	2.4	-1.7
3	November 1970	5.7	5.0	3.5	-1.5
4	March 1975	6.0	8.6	5.7	-2.9
5	February 1961	6.1	1.7	1.1	-0.6
6	May 1954	6.6	0.2	0.7	0.5
7	November 1927	6.6	-2.9	0.0	2.9
8	July 1924	9.0	-2.4	2.6	5.0
9	June 1938	10.3	-3.7	2.1	5.8
10	July 1921	11.0	-12.9	0.3	13.2
11	October 1949	11.3	-1.8	12.0	13.8

SOURCE: National Bureau of Economic Research, Inc.

^aPercent rate computed on base of GNP at preceding business cycle peak

^bChange over six-month span, seasonally adjusted at annual rate, placed at end of span.

^cThree-month average, centered on trough month

Consumer Price Index The recovery patterns tell us that during 1920-1950 the rate of change in the CPI registered large increases during the two years following each trough. (It is well to recall that the standings at troughs in this period, except for 1945, were all negative; i.e., the CPI was falling at the end of each of the six recessions in 1921-1938 and in 1949.) In the last quarter century, however, the prevailing inflation tended to moderate somewhat in the initial stages of the recoveries. The median 1949-1970 pattern lies below the base (trough standing = 0) line. The 1975 pattern shows a significantly greater decline in the inflation rate than was achieved in any of the recoveries of 1949-1970, but one must remember that the 1975-1976 reductions started from unusually high levels of inflation.

A close comparison of the patterns for the rate of change in the CPI and for GNP in constant dollars suggests that a relationship exists between the average rate of recovery in output and the concurrent change in the inflation rate. Table 10 illustrates this association for the first eighteen months of eleven business recoveries in the period 1921-1976.⁴⁶ In the six most vigorous recoveries (lines 6-11) inflation accelerated, the more so the greater the increase in real

GNP. In four of the five recent recoveries with below-median growth rates in real GNP (lines 2–5) the rate of inflation fell, as indicated by the negative entries in column 4. The only strong exception is the recovery from the 1929–1933 depression (line 1), which was initially sluggish but saw a drastic reversal in the price level movement, from a steep decline at the March 1933 business cycle trough to a fairly large rise eighteen months later. However, special factors promoted autonomous wage and price rises in this period, notably legislative measures such as the National Industrial Recovery Act passed in June 1933, and the rise in costs may have retarded recovery. (For a detailed analysis of cyclical changes in the 1930s, see Roose 1954, especially chaps. 3, 4, 8, and 9, and Friedman and Schwartz 1963, especially pp. 493–496.) When the 1933 recovery is excluded, the correlation between the ranks of entries in columns 1 and 4 of Table 10 is nearly perfect ($r_s = 0.96$); when it is included, the correlation is still positive but much lower ($r_s = 0.56$).⁴⁷

Sales of Retail Stores in Constant Dollars On the whole, the rise in this series during 1975–1976 was fairly close to the 1949–1970 average.

Business Capital Outlays in Constant Dollars These expenditures have been unusually sluggish in the first two years of the current recovery. The 1975 pattern lies below all the preceding recoveries.

Change in Business Inventories in Constant Dollars The 1973–1974 decline in real inventory investment, the largest since the 1930s, was followed by the strongest rebound. The inventory decline and recovery were not only large in absolute size but also relative to the change in total GNP. They accounted for 56 percent of the decline in real GNP during the recession and for 30 percent of the first year's recovery.

Bank Rates on Short-Term Business Loans Movements in this series during the 1975–1976 business recovery continued to resemble those in the inflation rate (CPI), as our graphs demonstrate, but again with smaller amplitude. The patterns for both variables show peaks about six months before the business cycle trough of March 1975 and downward trends during the first year or more of recovery. The decline in interest rates during this recovery has been unusually large and long by historical standards, according to our comparisons, although bank rates behaved rather similarly in the recovery that followed the previous (1970) recession. The 1933–1935 period provides another example of declining interest rates during a recovery. Here the evident reason was the continuing depression of investment and bank credit demand, since there was a sharp reversal in the rate of change of prices. In the current recovery the sluggishness of investment and ample supply of internal funds contributed to the decline in interest rates, reinforcing the effects of reduced rates of inflation.

Corporate Profits in Constant Dollars The recovery pattern of real profits shows a sharp rise in the first two quarters of the current recovery and oscillation with a mild upward drift thereafter. The 1975–1976 curve lies above the median 1949–1970 pattern. Only in the recoveries from the deep troughs of

1933 and 1938 have real profits shown larger relative increases than in 1975-1976, but in all three cases the preceding declines were exceptionally large also.

Index of Leading Indicators The pattern of this series, which rose almost continuously from February 1975 through December 1976, shows only small deviations (in either direction) from the path of the median 1949-1970 expansion.

In sum, the comparisons of cyclical patterns disclose several peculiarities of recent developments, the most important being the increase in the rate of inflation during the early phase of the recession and its decline during the early phase of recovery. The reaction can be described as an unusually long lag. The movement of interest rates was remarkably large, and lagged in a manner similar to that of the rate of price change. Huge swings downward in 1974 and upward in 1975 occurred in real net corporate profits and in real inventory investment. Business capital outlays in constant dollars declined late in this recession and rose late and with disappointing sluggishness in the current recovery.

APPENDIX: ON SOME PROBLEMS IN THE ESTIMATION OF REAL OUTPUT

Comprehensive series in constant dollars show unusual divergencies of movement from series in physical units during 1973-1974. In particular, real GNP declined throughout 1974, whereas the indexes of industrial production and nonagricultural employment declined decisively only after June and September 1974, respectively. The declines in real GNP were unusually large relative to those in previous recessions whereas those in industrial production and in employment were not especially large. This has led some contemporary observers to suspect "overdeflation"—that errors in the derivation of the constant-dollar values of national income and expenditure have been not only unusually large, but also systematic, in the direction of biasing downward such data as real GNP, real retail sales, etc. (see Okun 1974, especially p. 504, and Moore 1975).

One possible source of such errors could be that some prices reflected in current outlays and shipments are set by contract several weeks or months before. If current rather than past prices are used to adjust the current-dollar series, then in a period of generally rising prices overdeflation will result. Of course, escalator clauses in contracts would tend to prevent this and might even lead to underdeflation errors if the escalated prices accepted in the contracts exceeded the current prices. However, the speedup of inflation in 1973-1974 was, we believe, largely unanticipated; therefore, for some time during that period overdeflation would seem on balance more likely.

To resolve this empirical issue, then, it becomes important, especially in times of rapid changes in price levels, to know the dating of contract prices and whether and how such prices were escalated. This is by now well recognized, but information on these matters is still fragmentary. According to a current study by the NBER, the deficiencies of the wholesale price data are such that a full assessment of, and proper adjustments to, the present deflation procedures cannot really be made. A sample of WPI reports indicates that the index consists of an almost equal mixture of order prices of capital goods and industrial materials bought on contract for future delivery and of shipment prices at which the past output of the various goods has been sold. The lags between new orders and shipments, according to the BLS price reporters, are substantial: more than half fall in the range of one to six months for both order and shipment prices, but are generally shorter for those products represented by shipment prices than for those represented by order prices (see Ruggles 1977, p. I-22).

Contract prices are particularly important for types of output ordered for future delivery. Capital goods are largely of this type, and price indexes for such goods are on the whole weak.⁴⁸ The WPI prices of capital goods for a given month are as a rule those at which current sales are made (new orders are taken), not prices for deliveries in that month. The estimates of investment in equipment, however, are based on deliveries in that month. They represent not only sales in the same month but also sales made in earlier months at the then prevailing prices. Before 1974 current prices were used to deflate investment in producers' durable equipment, in effect, deliveries for a given month were adjusted largely by the price index of orders taken in the same month. In 1974, the procedure was substantially improved: the deflators now used are weighted averages of current and past prices, based on estimates of the typical time interval between the sale and delivery dates. The estimates of the order-delivery lags are derived from average ratios of unfilled orders to shipments (U/S), differentiated by type of equipment (the ratio is expressed as the number of months of current shipments represented by the current backlog of unfilled orders). The new procedure has been extended back to 1958 (see Rottenberg and Donahoe 1975, pp. 20-23, 28).

A deficiency of the revised approach is that it uses fixed lags between orders and delivery, whereas the actual lags vary with changes in the size and composition of the orders backlog. During business expansions, when rates of capacity utilization rise, delivery lags tend to lengthen; during contractions, they become shorter. The U/S ratios show, in fact, large cyclical movements (but often with rather irregular timing, notably long leads at business peaks and long lags at troughs). For example, the ratio for durable goods manufacturers declined from 3.3 to 2.6 months and averaged 3.0 months in 1968-1972, the period used to provide the first approximations to the price lags incorporated in the new deflators for equipment. However, it then rose from 2.7 to

3.6 months in 1973–1974 and fell back to 2.8 months by mid-1976. The use of fixed (average) instead of cyclically variable U/S ratios and estimated delivery periods would presumably make the price lags built into the equipment deflators too short in times of strong pressures of demand on capacity and too long otherwise. If so, some over- and underdeflation biases, respectively, would result, but their timing and size seem very difficult to establish short of a detailed analysis of the data and procedures used.⁴⁹

Another possibility is that the use of input rather than output prices in deflating expenditures could bias the results. The bias would be in the direction of overdeflation if output prices rose less than input prices, in the direction of underdeflation in the opposite case. In the long run, because of productivity increases not accounted for in the input cost indexes, overdeflation would be expected. Of the private-sector outlays, those on structures are particularly affected.⁵⁰ The problem also applies to the entire government sector, where output measures are generally lacking and productivity estimation is especially difficult.⁵¹ What statistical evidence there is, which pertains solely to the federal government, suggests that productivity has been rising. Hence the growth in government output in the national accounts may be underestimated.

In the short run the analytical situation is more complicated, however. It is often uncertain what kind of error would be generated by the use of input prices as deflators in a particular episode, and indeed whether any errors of systematic nature would necessarily result. In addition to an upward secular trend, productivity is subject to occasional short-term disturbances and cyclical variation which typically include declines late in expansion and early in contraction. Profit margins, which are a factor differentiating output prices from input prices, show strong procyclical movements, usually also with leads, notably at peaks. Relative prices of individual input and output categories vary considerably in ways not conforming to any simple or stable pattern.⁵² Our concern here is not with any long-run biases which would affect recent and earlier years alike, but rather with measurement problems that could cause serious distortions in the statistical picture specifically for the 1973–1976 interval. From this point of view, the principal difficulty created by the use of input price deflators probably is their failure to reflect the unusually sharp decline in profit margins in this period. In these circumstances, actual prices received would not rise as much as input prices, and overdeflation would result.

Another serious estimation problem during this period occurred in the area of inventory investment—its accounting as well as economic aspects. In times of rapid changes in the inflation rate, it is particularly difficult to evaluate the change in business inventories (CBI), a highly volatile component of GNP. In current-dollar GNP accounts, this component is measured at current replacement costs. To do this, starting from the reported inventory book values, requires a separation of the stock valued by the last-in first-out (LIFO) accounting method from the stock valued by the first-in first-out (FIFO) method, for the

two methods produce different dollar figures for costs of sales, values of inventory, and profits in any situation where prices of the goods sold from stock change over time.⁵³

When prices of goods held in stock rise, the appreciation is counted as profits in the FIFO but not in the LIFO system. Commerce estimates of the inventory valuation adjustment (IVA) serve to correct reported profits for such unrealized and partly spurious "paper profits" from higher inventory prices. IVA represents the difference between the change in book value of inventories, as reported by business firms using a mixture of accounting methods, and the change in inventories at current replacement cost, as computed by the Commerce Department from the business inventory reports. In 1974, the sharply rising prices resulted in an unprecedented large IVA.⁵⁴

The inventory profits which accrue under FIFO are taxable, while under LIFO such profits do not accrue (except for major inventory liquidations when profits from higher prices are realized—but such realizations can be avoided or postponed). Hence, many companies were shifting toward the use of LIFO under the impact of the high and rising inflation rates in 1973-1974.⁵⁵

The change in business inventories, like other expenditure components of GNP, is estimated in both current and constant dollars. The price indexes used to deflate the inventories are components of the wholesale price index (WPI) corresponding to the commodity composition of the given industry's stock. For FIFO inventories, the deflators are based on average prices for the current and preceding months, the number of months being approximately equal to the inventory turnover period. Increases in LIFO stocks reflect increases in physical volume valued at prices of recent acquisitions; so they are deflated by price indexes for the current period. However, a reduction in the volume of inventory means that withdrawals exceed acquisitions, and withdrawals can then be stated only in terms of prices of those prior periods in which the sold goods entered the stock, not in terms of current replacement costs. Thus decreases in LIFO stocks reflect decreases in physical volume valued at earlier prices; hence, they are deflated by applying ratios of the base-period prices to the prices of the acquisition period (see Rottenberg 1974; Herman, Donahoe, and Hinrichs 1976).

Early estimates of the inventory change in 1973, particularly in the latter part of the year, and 1974:1 were beset by very large underestimation errors, as indicated by the major upward revisions of July 1974. This has been attributed in large measure to "a rather unique and unfortunate combination of events. The late reports and introduction of a new sample are infrequent events and the revisions in book values were all in one direction" (Young 1974, p. 38).⁵⁶ But it is recognized that more basic problems exist.⁵⁷ Data on the commodity composition of inventories and the applicable price indexes are far from adequate. Information on inventory accounting methods available in 1973 was quite obsolete. A system of monitoring the changes in inventory valuation and reporting methods was instituted by BEA in 1974.

Suppose that a company shifts to LIFO accounting but this is not reported and not known to the Census and BEA at the time. Then the IVA would be erroneously applied to the company's reported book value stocks, and the result—at a time of rising prices and rising inventories—would be underestimation of inventory investment. In other words, for given overall book values, if the LIFO proportion were underestimated, then so would be the total change in inventories. However, this effect would tend to be offset to some extent in the calculation of the constant-dollar change in business inventories. If the deflators for the LIFO part (current prices) are higher than those for the FIFO part (averages of current and earlier prices), understatement of the LIFO proportion would mean that the price indexes used in the calculation are too low, which would work in the direction of overestimation of inventory investment in constant dollars.

The revised estimates published early in 1976 show that the previously published IVA figures were actually *underestimated* during the recession, moderately in the first three quarters of 1974 and heavily in the two following quarters.⁵⁸ Evidently, errors of the type suggested above were not large and frequent enough to dominate the outcome.⁵⁹

In sum, it is still true that "more than a usual amount of uncertainty surrounds the behavior of real output in the first 3 quarters of 1974."⁶⁰ There are always many opportunities for error in the massive task of deriving the constant-dollar GNP figures, and the errors are likely to have been much enlarged in this period of high and variable inflation rates. Although some factors would work in the opposite direction, a reasonable argument can be made that on balance some overdeflation occurred. But the error would have to be very large indeed to produce a rise instead of a decline in real GNP during the first two or three quarters of 1974.⁶¹

According to the current measures, real GNP declined 6.6 percent during the 1973-1975 recession and only 3.2 percent during the 1957-1958 recession. For industrial production, the difference is much smaller: the index fell 15.3 percent in the last recession, 13.5 percent in 1957-1958. For total civilian employment there is no difference: employment fell 2.3 percent in both recessions. It is of interest to ask what the implicit price deflator for real GNP would have to have been, with the same current dollar GNP, to produce a 1973-1975 decline equal to that in 1957-1958. The calculation below provides the answer (GNP figures are in billions of dollars at annual rates, and percent changes are from 1973:4 to 1975:1):

	Curr./Dol. GNP	Implicit Price Deflator (IPD)		GNP in Constant (1972) Dollars	
		1972 = 100	Change	Level	Change
1973:4	\$1,355.1	109.0		\$1,242.6	
1975:1	1,446.2	124.6	+14.3%	1,161.1	-6.6%

	Curr./Dol. GNP	Implicit Price Deflator (IPD)		GNP in Constant (1972) Dollars	
		1972 = 100	Change	Level	Change
1973:4	1,355.1	109.0		1,242.6	
1975:1	1,446.2	120.2*	+10.3*	1,202.8*	-3.2*

Asterisks indicate the hypothetical figures; the other entries are the actually recorded values. The difference between the calculated five-quarter increase in IPD of 10.3 percent and the measured increase of 14.3 percent is perhaps small enough to be within the range of possible error in the price statistics for a period such as 1973-1975. (Translated into percent increases at annual rates, the figures would be a little over 11 and 8 percent, respectively.⁶²)

Certain differences in coverage, estimation procedures, etc., between real GNP and the index of industrial production (IIP) could conceivably account for most or all of the recent discrepancies between the movements of the two series. Without a full reconciliation, the possibility that there are large systematic errors cannot be entirely discounted, but it must be noted that such errors could occur in either series. Less than half of the large number of individual monthly series included in IIP are physical product figures, and some of these are based upon shipments or sales rather than output from current production; nearly 30 percent of the IIP components are electric power consumption series, 17 percent are man-hour series, and 7 percent are combined kilowatt-hour and man-hour series.⁶³ All the series are adjusted to reflect output rather than shipments or input, but the adjustments must perforce be based, as in the case of many of the GNP series, upon inadequate information. The adjustment of shipments or sales requires knowledge of inventory change. The adjustment of power consumption and man-hours requires knowledge of output per kilowatt-hour or per man-hour. The physical product series combined typically show larger short-run fluctuations than the electric power and man-hour series combined. The proportion of the product series is small and that of the man-hour series is large in the equipment category, which effectively resisted a decline in the early stages of recession in 1974; this might account for some of the relative strength of IIP during that period. Under the particular conditions created by the energy crisis, the electric power series might have represented production less well than at other times. Indeed, the electric power (KWH) estimates dominate the group of IIP components that peaked late, as shown by the following figures:

	Proportion of Estimates Based on		
	Product Data	KWH Data	Man-hour Data
13 series with early (1973) downturns	66.3	20.3	13.4
8 series with late (1974) downturns	21.5	64.7	13.8

Finally, prior to its last revision (in June 1976) IIP was not really equipped to reflect certain important shifts in the composition of output such as the rising share of small cars in automobile production (which was very important in the period under review), but this deficiency has been largely corrected in the current revised IIP data.⁶⁴

NOTES

1. in addition to Moore (1975, 1977), see Okun (1975a) and other reports in *Brookings Papers on Economic Activity*, no. 1 (1975) and Cagan (1976, 1977).
2. The method of trend adjustment is adapted from that used by Mintz (1970, 1974). Mintz estimates the trend from the raw (but, where needed, seasonally adjusted) data by a centered 75-month (or 25-quarter) moving average. We start with the same step but derive more stable and cycle-free trend rates of growth as follows: The averages of the raw data are computed for each of the intervals (phases) between the specific turning points in the deviations from the moving average, and a three-point moving average of the resulting phase averages is taken. The trend is then interpolated monthly (or quarterly) between the values of the three-point moving average. Twelve-month moving averages are used to eliminate sharp transitions between the trend segments so obtained. The trend segments in the end phases are extended by straight-line extrapolation to the beginning and end of the data. Deviations of the raw data from this trend yield the final trend-adjusted series, from which the set of turning points shown in Table 1 is derived.
3. Limitations of space do not permit full documentation of the many statements of fact made in this paper. Most of the required material can be found in the Commerce Department's *Business Conditions Digest* (BCD) and the Labor Department's *Chartbook of Prices, Wages and Productivity*, two monthly reports that cover a large number of cyclical indicators and other economic time series of current interest. Tables and graphs in this report provide some additional evidence. Some of the developments during the slowdown-recession-recovery period under discussion are presented in the cyclical comparison charts used in the next section to place the recent changes in historical perspective.
4. These contractions are evident in both current-dollar aggregates and in the deflated series. On the other hand, expenditures on nondurable goods continued to expand in current dollars, while declining gently in constant dollars, and expenditures on services rose in both current and constant dollars.
5. The source of the forecasts is the Business Outlook Survey conducted quarterly by the American Statistical Association and the National Bureau of Economic Research. The number of respondents in the five surveys included in the tabulation varied between 45 and 67; they included business, academic, and government economists professionally engaged in business conditions analysis and forecasting. All figures are at annual rates. The "actual" figures are taken from the August 1974 issue of BCD.
6. The major source of data on price expectations of consumers is a representative national sample (1,500 to 3,500 respondents) regularly surveyed by the Survey Research Center at the University of Michigan. See Sandmo (1970), Juster and Wachtel (1972), Juster (1973), Juster and Taylor (1975), and Wachtel (1977).
7. The list may not be complete, but all these factors are discussed in the recently mushrooming literature on inflation. To be sure, writers with different theoretical views emphasize different basic and proximate causes of the observed price-level movements. Some stress the effects of monetary growth rates and the dynamics of price and wage expectations versus realizations, others stress the role of exogenous changes in wages and other costs and of

contractual arrangements in labor and product markets. For some recent reviews and contributions, with many bibliographic references, see Okun (1975b) and Gordon (1976).

8. In 1973, with the unemployment rate remaining quite stable near its local peak level of less than 5 percent, the principal reason for the fall of the index must be seen in the climbing consumer prices, with the unfolding downturn in stock prices playing a significant but smaller role.
9. Cooper and Lawrence (1975). The authors of this paper and its discussants also consider exchange-rate uncertainty and price controls as other possible reasons for the commodity speculation.
10. The ratio of the CPI for food to the CPI for all other items (1967 = 100), which varied narrowly between 0.97 and 1.04 in 1954-1972, rose to 1.13 in 1973. Food prices accounted for slightly more than half of the rise in the CPI during 1973 (see Hathaway 1974). The farmers' share in total personal income increased from 2.9 percent to 4.2 percent between December 1972 and December 1973 (by December 1974 it had fallen back to 3 percent).
11. We relegate to an appendix the discussion of a major technical question, namely whether the errors produced by these adjustments would likely be systematic in the sense of seriously over- or underestimating the size and duration of the broad movements of the economy. Our tentative answer is that there are serious questions or uncertainties about the measures, but we have found no firm indications of bias.
12. Much of the strength of investment in producers' durable equipment may be attributable to incentives provided by the accelerated depreciation allowances and the investment tax credit (both adopted in 1971). Such incentives have been estimated to have a substantial long-run stimulating effect on the rate of accumulation of capital in the form of machinery and equipment (see Jorgenson 1971).
13. Unemployment totals and rates tend to turn upward before business cycle peaks because employment typically rises slowly in the late stages of expansion, while the labor force grows at a fairly steady rate. The reduced growth in employment is caused either by demand slowdowns or by supply constraints, or both. (In the initial stages of expansion, employment often grows slowly as well because of the as yet uncertain outlook and the concurrent rises in the average workweek and labor productivity; hence, unemployment frequently lags at business cycle troughs.) For related reasons, the GNP gap (and other measures of capacity utilization) also have leads at peaks.
Smaller deviations from coincident timing have been observed for some other indicators on our list; e.g., the employee-hours series leads at peaks by short intervals, reflecting the much longer and more systematic lead in the average workweek. All such facts must be taken into account in the interpretation of chronologies of the type shown in Table 1.
14. Particularly difficult to interpret are the data for retail trade. Deflated retail sales show a contraction of 11.8 percent between March 1973 and November 1974. In contrast, employment in retail establishments is reported to have increased by 3.3 percent from March 1973 through September 1974. Part of the puzzle seems explained by newly compiled statistics which show that the average workweek in retail trade decreased gradually from 33.6 hours in February 1973 to 32.4 hours in November 1974, i.e., by 3.6 percent. Total employee-hours varied narrowly and irregularly between 12.3 and 12.9 million per month in 1973-1974. Thus, greater use was made of part-time workers, but total labor input was not reduced, despite the apparent decline in the volume of business. As they stand, the figures imply that productivity (real sales per employee-hour) fell 11.4 percent in 1973-1974, an extraordinary decline.
15. This tabulation, based on the median forecasts from the ASA-NBER surveys, parallels that given earlier in the text to illustrate the 1973 predictions. The number of participants in the surveys covered varied between 49 and 62. The survey forecasts have been presented in successive issues of *Explorations in Economic Research*, published by NBER. The data for actual rates are taken from the August 1975 issue of BCD.

16. It appears from these and other direct data on anticipated price-level changes that inflationary expectations were formed adaptively in the sense of responding to recent realizations. Models of expectations which seem consistent with these data were developed by Cagan (1956), Frenkel (1975), and Mussa (1975).
17. It is true that business production and investment decisions are based mostly on "micro" data, which are more familiar and more promptly available to decision-makers than the "macro" variables observed by the economist. But economic aggregates are based on accounting figures compiled at the level of the firm, and it is precisely these microdata that are subject to various complications, problems of interpretation, and possible distortions in periods of accelerating inflation and other unique disturbances. (For example, in addition to the commodity and energy shortages, 1973-1974 witnessed price and wage decontrols and increases in legal minimum wages.) As indicated by data revisions, changes in accounting procedures, and contemporary accounts, evaluation of the current state of business income, price-cost relations, and inventories has been particularly difficult in this turbulent period. (See the appendix for some illustrations of the data problems involved.) It seems reasonable to assume that this caused an increase in the frequency and average size of the informational delays and errors. The source of the latter may lie in the inability of individuals to distinguish promptly and properly between the absolute and relative components of unanticipated price movements. (This has been emphasized in recent work on the aggregate supply theory by Friedman, Phelps, Lucas, and others; see Poole 1976 for a survey and references.) However, in the present context, it is necessary also to consider the effects of faulty adjustments for price changes of sales, inventories, and profits, and the confounding of transitory and longer movements in these variables.
18. In the 1969-1970 recession, inflation continued at rates that were sufficiently high to prevent the major aggregates in current dollars from declining, for there were only relatively mild declines in the measures of real economic activity (in physical or deflated value units). In most earlier U.S. recessions, prices either fell or rose so slowly compared with the contractions in total output and labor input that the real and nominal indicators tended to move together. In the 1973-1975 recession, for the first time since 1920, cyclical downturns in some of the major current-dollar series appeared with long lags behind the downturns in the real aggregates. As in the 1920-1921 recession, inflation was strong enough to produce these long lags, but recession was strong enough to cause the eventual declines in the nominal indicators.
19. This is so according to the most recent general revision of the Federal Reserve Board's index, completed in June 1976. Before that revision, the index had a peak of 127.5 in November 1973 and a secondary high of 125.8 in June 1974. (See the Federal Reserve press release of June 28, 1976, and "Industrial Production—1976 Revision," *Federal Reserve Bulletin*, June 1976, pp. 470-479.)
20. Even excluding construction, the GNP data show greater weakness in 1974 than the industrial production index. Real GNP adjusted to be as comparable as possible with industrial production shows a peak in the fourth quarter of 1973 and declines every quarter thereafter, reaching a trough in the first quarter of 1975 (see *Survey of Current Business*, October 1976, pp. 9-10).
21. The intentions were reflected more clearly in the change in inventories on hand and on order than in the change in inventories alone; the former declined quite steadily and sharply throughout 1974 and early 1975, whereas the latter bounced up temporarily in the fourth quarter of 1974. Outstanding orders can ordinarily be adjusted promptly by purchases when they consider their inventories excessive.
22. In this respect, the developments in 1972-1973 resembled those in 1956-1957, but the similarity extends only to the changes in the growth rates in the supply of money and near-money (selected assets of high liquidity); the growth rates themselves were on the average

much higher in 1972-1973 than in 1956-1957, as were the growth rates in current-dollar GNP.

23. The first indication of a moderately stimulating impact on consumer sentiment of the proposed tax legislation was reported in the February 1975 survey by the University of Michigan Survey Research Center.
24. Tax receipts, based on rates applied to the rising nominal levels of incomes and profits (which were falling in real terms), increased sharply during the first three quarters of this recession, adding to the economy's weakness. During previous recessions tax payments to the federal government declined more promptly. Then, during the next three quarters (ending June 1975), federal receipts fell at an accelerating rate, from \$299 billion to \$250 billion or by 16.4 percent (all dollar figures in this note are at annual rates). In the same period, federal expenditures rose from \$307 billion to \$352 billion or by 14.7 percent (to be compared with their increases of 13.5 percent in the first three quarters of 1974—the mild-decline phase of recession—and of only 4 percent in the last three quarters of 1973, the slow-growth phase of expansion). The federal deficit, which earlier in 1973-1974 stayed relatively low (between \$4 billion and \$8 billion) skyrocketed from \$8 billion in 1974:3 to \$102 billion in 1975:2.
25. The dispersion of specific turning points over time has been greater at business cycle peaks than at troughs. For example, the standard deviation of leads and lags in 1948-1970 was 8.8 months at peaks and 5.7 months at troughs for the set of twenty-seven series included in the composite indexes of leading, coincident, and lagging indicators (see BCD, February 1977, p. 106, for a tabulation of the cyclical timing measures for these series).
26. At annual rates, the change in business inventories amounted to about \$15 billion in each of the first three quarters of 1976 and \$1.7 billion in the fourth quarter; the corresponding figures in 1972 dollars are approximately \$10 billion and \$1 billion.
27. The number of employees on nonagricultural payrolls (establishment survey) fell 3 percent from September 1974 to June 1975, then rose 3.8 percent by June 1976. The number of persons engaged in nonagricultural activities (labor force survey) fell 2.3 percent from July 1974 to March 1975, then rose 4.1 percent by June 1976. Total civilian employment (labor force survey) fell 2.4 percent from July 1974 to March 1975, then rose 3.9 percent by June 1976.
28. See the corresponding tabulations for 1973 and 1974 predictions in the section on the 1973 slowdown. The membership in the surveys covered varied between 44 and 52. The data for actual rates are taken from BCD, March 1977.
29. At annual rates, growth in M_1 declined to less than 3 percent in the last quarter of 1975 and also in the first quarter of 1976, while GNP gained nearly 11 and 13 percent respectively; hence velocity as measured by GNP/M_1 increased about 8-10 percent. (In the third quarter of 1975, both M_1 and GNP rose at much higher rates, but velocity recorded a similar advance.) Although velocity increased during each of the recent business recoveries, it did so at much lower rates. It has been suggested that a decline occurred recently in the volume of demand deposits that the public desires to hold at given levels of income and interest rates; because certain interest-earning assets (notably savings accounts at commercial banks) can now be used more easily for making payments. For some details on the new economic and legal developments in this area, see *Federal Reserve Bulletin*, March 1976, pp. 191-192.
30. Consider the following chronology of the last high (H) and low (L) values in the diffusion indexes:

	H	L
Leading	August 1972	October 1974
Coincident	September 1973	February 1975
Lagging	February 1974	June 1975

31. See the quarterly turning points in Table 2, lines 22-24. The monthly dates for the leading, coincident, and lagging indexes, respectively, are: peaks—June 1973, November 1973, and October 1974; troughs—February 1975, March 1975, and April 1976.
32. The growth cycle indexes are based on component series expressed as deviations from trend; hence, "expansions" and "contractions" here represent high-growth and low-growth phases, respectively. For further detail regarding the construction of the composite and diffusion indexes used for reference dating, see Mintz (1974, pp. 22-24).
33. When a historical cumulative diffusion index drifts neither upward nor downward, it means that about half of the component series are expanding and half are contracting.
34. The inclusion in the index of the few current-dollar aggregates that *did* contract would not have changed the date of the downturn. The inclusion of all current-dollar aggregates covered would have produced an index with a double-peak (November 1973 and August 1974) configuration. But this combination of current-dollar and deflated or physical unit aggregates has little to recommend it when the components behave in such divergent fashion.
35. Spearman's rank correlation coefficient is defined as $r_s = 1 - [6S/(n^3 - n)]$, where $S = \sum d^2$ is the sum of squared differences between the ranks and n is the number of ranks. The following excerpt, based on the exact distribution given in Owen (1962, p. 401), shows the probability (CP) that S is less than a fixed value (hence that r_s is greater than a fixed value) for $n = 6$:

S	r_s	CP	$(CP)^2$
4	0.89	0.017	0.034
6	0.83	0.029	0.058
8	0.77	0.051	0.102
10	0.71	0.068	0.136
12	0.66	0.088	0.176

Approximately, then, for ranks of six observations $|r_s|$ must equal or exceed 0.89 to be significant at the 0.05 level. If r_s is expected to be positive (i.e., on the one-tailed test), the corresponding value would be 0.83.

These results assume no tied ranks and make no correction for continuity (note that any value of S must be even). For full explanation, see Kendall (1948).

36. The corresponding rank correlation for the index of industrial production (i.e., the correlation between lines 12 and 17) is virtually zero ($r_s = -0.1$). This is influenced by the short decline in the index in the last recession, but the correlation is low even when this observation is omitted.
37. To reduce the influence of isolated, outlying values, we use three-month averages centered on the months of specific turning points covered. All our series, except two, conform positively to business cycles; so the measured changes represent total percent amplitudes of cyclical declines. The two unemployment series move countercyclically, i.e., rise in business recessions; here, rank 1 denotes the smallest rise and rank 6 the largest.
38. This extent of agreement was determined by using coefficients of concordance (W), which are closely related to averages of all Spearman's rank correlation coefficients that can be computed for a given number of rankings, m ; that average equals $\bar{R} = (mW - 1)/(m - 1)$. See Kendall (1948, Chap 6).

When the employment series (lines 25-27, 29, 31, and 34) are excluded, W for the remaining complete rankings in Table 6 is 0.74.

39. When the employment series (lines 25-27, 29, 31, and 34) are excluded, W for the remaining complete rankings in Table 8 is 0.77. These measures are comparable and very similar to those for Table 6 (see note 38 and accompanying text).

40. If the effects of strikes could be eliminated, the dates of peaks and troughs might well be affected, as well as the amplitudes. A further complication is that some strikes are anticipated and all have aftermaths. Exclusion of the strike month may limit the average to the months strongly affected by both the anticipatory and catching-up activities (purchases, production). Nevertheless, this adjustment would have changed only a few of the individual rankings in tables 6 and 8 and not the overall rank averages.
41. The diffusion indexes for employment use components of BCD series 41—number of employees on nonagricultural payrolls, establishment survey (Bureau of Labor Statistics). The index based on the finer decomposition (172 industries) applies to a somewhat less comprehensive aggregate than does the 30-industry index, and it covers only the last three contractions. The diffusion index for production uses the 24-industry components of BCD series 47—index of industrial production (Board of Governors of the Federal Reserve System). For examples of diffusion indexes of leading and lagging indicators see charts 3, 4, and 5 and accompanying text.
42. Except for the 1929-1933 period, all business contractions covered were shorter than 18 months; so their full course plus the last year of the preceding and a short initial part of the following expansion are portrayed in the first set of our graphs. On the other hand, all but two of the business expansions covered lasted longer than 24 months (the exceptions are the 1921-1923 and 1927-1929 phases, which lasted 22 and 21 months); so graphs in the second set show for the most part only the recovery stages of expansion plus the last 6 months of the preceding contraction.
43. Total retail sales were used for 1947-1976; department store sales, for 1919-1946. Department stores carry a general line of apparel and furnishings; they handle only to a minor extent or not at all such goods as automobiles, tires and parts, gasoline and other fuels, and food. In the period covered by both series (since 1935), the relative cyclical amplitudes of current-dollar sales of department stores were in most instances larger than those of current-dollar retail sales. This lends additional emphasis to the showing in Chart 6 that the 1973-1975 percent decline in real retail sales was larger than the 1929-1931 decline in real department store sales. However, the comparison may suffer from unknown errors in the adjustment for price level changes.
44. Since profits after taxes are partly paid out in dividends and partly retained and used to finance investment (mainly in fixed but also in working capital), a comprehensive price index seemed to be the most appropriate deflator. We decided to use the GNP implicit price deflator. The fixed-weight price index for the gross business product (BCD, 311) might have been preferable but is not available prior to 1965.
45. For example, assume that two recessions start from the same peak level, say 100, but one recession is mild, with a trough at 90, the other severe, with a trough at 50. If now the recovery produces a five-point rise, to 95 and 55, respectively, the percent rise, calculated in the usual way, would be 5.6 percent in the first case, 10 percent in the second. Relative to the preceding peak level, however, the rates of recovery in the two instances are the same, and the higher percent increase in the second case is due to the low base. Incidentally, contrary to this example, past patterns of recovery tend to show larger increases in real output when the preceding recession has been severe than what it has been mild, even when measured relative to preceding peak levels.
46. There have been twelve business expansions since 1921: the one that started in October 1945, following the eight-month decline connected with the World War II reconversion, is not included because of the peculiarities of that episode.
47. Consistent results are also obtained for the relation with nonfarm employment and with unemployment. The larger the rise in employment or decline in the unemployment rate during the eighteen months of a recovery, the larger the rise in the CPI inflation rate. Here $r = 0.93$

- for employment and -0.81 for unemployment for the eight recoveries of 1933–1976 (excluding 1945). These observations remind one of the recently advanced “accelerationist” view of the unemployment-inflation relationship. See also Moore (1976).
48. In some cases, such as structures other than single-family houses, they are indeed nonexistent, and indexes of cost of inputs (material, labor) are used instead as poor substitutes. The presence of a serious secular upward bias in the official price indexes is suggested in Robert J. Gordon’s forthcoming study for NBER on the measurement of durable goods prices.
 49. A comparison of output of capital equipment as measured in the industrial production index with deflated expenditures on capital equipment as measured in the national income accounts shows an unusual divergence in 1974–1975, with deflated expenditures beginning to decline two quarters earlier and beginning to rise one quarter later than output, with a total decline of 20 percent in expenditures and 13 percent in output. This suggests overdeflation of expenditures, but does not prove it. See *Capital Goods Review* (Machinery and Allied Products Institute), no. 104, October 1976.
 50. In 1963 the Census Bureau introduced an index of sales prices for single-family houses, which was a major improvement, and a further advance was made recently through the joint development by BEA and Census of new prices indexes for structures. (For details on the new measures, see “Revised Deflators for New Construction, 1947–63,” *Survey of Current Business*, August 1974, pp. 18–27.) Still, for most types of construction the deflators must be based on inadequate input price indexes.
 51. In 1962 a study by the U.S. Bureau of the Budget demonstrated that useful productivity measures could be developed for many activities of U.S. government organizations. In 1973 the Office of Management and Budget decided that work to measure federal productivity should continue, as a responsibility of the Bureau of Labor Statistics. By 1974, about 1.7 million man-years, or 61 percent, of federal civilian government employment were covered by the output per man-year measures developed for some two hundred organizational units grouped into sixteen functional areas. Productivity for the total measured sample rose at an average annual rate of 1.6 percent a year during fiscal years 1967–1973. For the 96 annual changes recorded for the sixteen groups, 66 were increases and 29 decreases in productivity (1 was unchanged). Most of the declines occurred in fiscal 1970, 1972, and 1973, with no apparent relation to the business cycle. See Ardolini and Hohenstein (1974).
 52. For example, it is widely believed that in recent years real prices of land and raw materials increased more than real wages. The overall relationship between input and output prices in construction during 1973–1976 is very hard to assess, partly because of weaknesses in the available data. To cite just one ambiguous comparison, construction cost indexes (Department of Commerce composite) rose somewhat faster than the implicit price deflators for purchases of residential structures in 1973–1975, but somewhat slower than the deflators for nonresidential structures.
 53. Under the FIFO method, the cost of goods sold (withdrawals from the stock) is computed at the acquisition cost of those goods that have been in inventory the longest time. The LIFO method values the withdrawals at cost of the goods that have been in inventory the shortest time. Thus, the remaining inventory entered on the balance sheet is valued under FIFO at the cost of the recently acquired items, under LIFO at the cost of the earlier acquired items. (The valuation of acquisitions is at current purchase price in either method.) Other methods of inventory accounting yield intermediate results, but they are less important and may be ignored here. For further explanations, see Rottenberg (1974, pp. 29–33, 58–61) and Shoven and Bulow (1975).
 54. The present estimate of IVA in 1974 is a negative \$38.5 billion. (IVA is negative when prices increase, positive when prices fall.) To appreciate this magnitude, note that before-tax

profits of nonfinancial corporations equaled \$103.8 billion and undistributed profits and dividends were each approximately \$30.5 billion (less than IVA!). In 1975, IVA declined absolutely to a negative \$11.2 billion.

55. At the end of 1973, only about 10 percent of the 2,600 firms listed on the New York and American stock exchanges were using LIFO, and nearly one-fifth of those had adopted the LIFO policy during that year. In 1974 approximately 250 firms were reported as making a full or partial switch to LIFO (quoted from Shoven and Bulow 1975, p. 588; see their references). Evidently, FIFO remains the most commonly used inventory accounting method despite the tax advantages of LIFO in inflationary times. Several reasons for this have been suggested, mainly that firms wish to avoid showing lower reported earnings or expect that their sales prices may fall or that they may have to reduce their inventories sharply at relatively frequent intervals.
56. Specifically, there was misjudgment of an unusual timing pattern of changes in farm stocks during 1973, errors in the adjustments for bias between the monthly and the later (and higher) annual data, and a new sample and new seasonal adjustments for retail inventories.
57. Problems of measuring business inventories and their change, always difficult but especially interesting and challenging in inflationary times, are being systematically examined in a new NBER study; see Foss, Fromm, and Rottenberg (1976, p. 29).
58. The following data on IVA, in billions of dollars, seasonally adjusted at annual rates, are taken from the *Survey of Current Business*, January 1976, part I, p. 18 (Table 7, first two columns):

	1974				1975		
	Q1	Q2	Q3	Q4	Q1	Q2	Q3
Previously published	-33.8	-40.3	-61.7	-38.0	-7.6	-10.6	-13.1
Revised	-35.6	-43.5	-63.9	-43.0	-16.0	-7.8	-11.5

59. According to the producers of these statistics, programs undertaken in recognition of the need to update the LIFO proportion and to improve the IVA calculation have worked well.
60. *Economic Report of the President*, February 1975, p. 45 (see the section on "Comparisons of Output Change," pp. 45-47).
61. For example, what error in the implicit price deflator (IPD) would have been necessary to shift the peak in real GNP from 1973:4 to 1974:3, assuming that the nominal GNP data were correct? Reported IPD rose 8.3 percent between the two periods; it would have had to increase less than 5.7 percent to effect the shift. This means that the required "overdeflation" error would have had to exceed 31 percent of the rate of price level increase as measured by IPD for the period 1973:4-1974:3.
62. It should be noted that we are here concerned solely with the overall relative amplitudes of specific cycle contractions in real GNP and ignore the differences in the duration of these movements. In 1973-1975, the decline in real GNP lasted five quarters; in 1957-1958, it lasted two quarters. For the industrial production index, the corresponding durations are nine months in 1974-1975, and fourteen months in 1957-1958.
63. See Board of Governors of the Federal Reserve System, *Industrial Production 1971 Edition*, Washington, D.C.: November 1972, especially pp. 32-37. Corresponding information on the 1976 revision of IIP has not yet been published.
64. See "Industrial Production—1976 Revision," *Federal Reserve Bulletin*, June 1976, p. 471. Beginning with 1967, separate series are now shown for large and small autos, consumer-type utility vehicles, and business vehicles.

REFERENCES

- Ardolini, Charles, and Jeffrey Hohenstein. 1974. "Measuring Productivity in the Federal Government." *Monthly Labor Review*, November.
- Cagan, Phillip. 1956. "The Monetary Dynamics of Hyperinflation." In Milton Friedman, ed., *Studies in the Quantity Theory of Money*. Chicago: University of Chicago Press.
- Clarkson, Kenneth W., and Roger E. Meiners. 1977. *Inflated Unemployment Statistics—The Effects of Welfare Work Registration Requirements*. Coral Gables: University of Miami, School of Law, Law and Economics Center.
- Cooper, Richard N., and Robert Z. Lawrence. 1975. "The 1972–75 Commodity Boom." *Brookings Papers on Economic Activity*, no. 3.
- Feldstein, Martin S. 1976. "Temporary Layoffs in the Theory of Unemployment." *Journal of Political Economy*, October.
- . 1975. "The Importance of Temporary Layoffs: An Empirical Analysis." *Brookings Papers on Economic Activity*, no. 3.
- Foss, Murray; Gary Fromm; and Irving Rottenberg. 1976. "Measurement of Business Inventories." *56th Annual Report*, National Bureau of Economic Research (September).
- Frenkel, Jacob A. 1975. "Inflation and the Formation of Expectations." *Journal of Monetary Economics*, October.
- Friedman, Milton, and Anna J. Schwartz. 1963. *A Monetary History of the United States, 1867–1960*. Princeton, N.J.: Princeton University Press for NBER.
- Gilbert, R. Alton. 1976. "Bank Financing of the Recovery." *Federal Reserve Bank of St. Louis Review*, July.
- Gordon, Robert J. 1976. "Recent Developments in the Theory of Inflation and Unemployment." *Journal of Monetary Economics*, April.
- Hathaway, Dale E. 1974. "Food Prices and Inflation." *Brookings Papers on Economic Activity*, no. 1.
- Herman, Shelby W.; Gerald F. Donahoe; and John C. Hinrichs. 1976. "Manufacturing and Trade Inventories and Sales in Constant Dollars, 1959 to First Quarter 1976." *Survey of Current Business*, May.
- Hymans, Saul H. 1970. "Consumer Durable Spending: Explanation and Prediction." *Brookings Papers on Economic Activity*, no. 2.
- Jorgenson, Dale W. 1971. "The Economic Impact of Investment Incentives." In Subcommittee on Fiscal Policy of the Joint Economic Committee, *Hearings*. 92nd Cong., 1st. sess.
- Juster, F. Thomas. 1973. "Savings Behavior, Uncertainty, and Price Expectations." *The Economic Outlook for 1974*. Ann Arbor: University of Michigan.
- Juster, F. Thomas, and Lester D. Taylor. 1975. "Towards a Theory of Saving Behavior." *American Economic Review*, May.
- Juster, F. Thomas, and Paul Wachtel. 1972. "Inflation and the Consumer." *Brookings Papers on Economic Activity*, no. 1.
- Kendall, Maurice G. 1948. *Rank Correlation Methods*. London: Griffin.
- Lovell, Michael C. 1975. "Why Was the Consumer Feeling So Sad." *Brookings Papers on Economic Activity*, no. 2.
- Mintz, Ilse. 1970. *Dating Postwar Business Cycles: Methods and Their Application to Western Germany, 1950–67*. Occasional Paper 107. New York: NBER.
- . 1974. "Dating United States Growth Cycles." *Explorations in Economic Research*, Summer.
- Moore, Geoffrey H. 1975. "Slowdowns, Recessions, and Inflation: Some Issues and Answers." *Explorations in Economic Research*, Spring.
- . 1976. "Employment, Unemployment, and the Inflation-Recession Dilemma." In William Fellner, ed., *Contemporary Economic Problems*. Washington, D.C.: American Enterprise Institute.

- Mussa, Michael. 1975. "Adaptive and Regressive Expectations in a Rational Model of the Inflationary Process." *Journal of Monetary Economics*, October.
- Okun, Arthur M. 1974. "Unemployment and Output in 1974." *Brookings Papers on Economic Activity*, no. 2.
- . 1975a. "A Postmortem of the 1974 Recession." *Brookings Papers on Economic Activity*, no. 1.
- . 1975b. "Inflation: Its Mechanics and Welfare Costs." *Brookings Papers on Economic Activity*, no. 2.
- Owen, D. B. 1962. *Handbook of Statistical Tables*. Reading, Mass.: Addison-Wesley.
- Poole, William. 1976. "Rational Expectations in the Macro Model." *Brookings Papers on Economic Activity*, no. 2.
- Popkin, Joel. 1974. "Commodity Prices and the U.S. Price Level." *Brookings Papers on Economic Activity*, no. 1.
- Roose, Kenneth D. 1954. *The Economics of Recession and Revival*. New Haven: Yale University Press.
- Rottenberg, Irving. 1974. "Inventories and the Inventory Valuation Adjustment." *BEA Staff Paper No. 25* (October).
- Rottenberg, Irving, and Gerald Donahoe. 1975. "Improved Deflation of Producers' Durable Equipment." *Survey of Current Business*, July.
- Ruggles, Richard. 1977. *The Wholesale Price Index: Review and Evaluation*. Washington, D.C.: Executive Office of the President, Council on Wage and Price Stability.
- Sandmo, A. 1970. "The Effect of Uncertainty on Saving Decisions." *Review of Economic Studies*, July.
- Shoven, John B., and Jeremy I. Bulow. 1975. "Inflation Accounting and Nonfinancial Corporate Profits: Physical Assets." *Brookings Papers on Economic Activity*, no. 3.
- Yang, Jai-Hoon. 1977. "A Guide to Capital Outlays in the Current Recovery." *Federal Reserve Bank of St. Louis Review*, February.
- Young, Allan H. 1974. "The July 1974 Revisions." *BEA Staff Paper No. 25* (October).
- Wachtel, Paul. 1977. "Survey Measures of Expected Inflation and Their Potential Usefulness." In *Analysis of Inflation: 1965-1974*. Studies in Income and Wealth 42. Cambridge, Mass.: Ballinger for NBER.
- Zarnowitz, Victor. 1973. *Orders, Production, and Investment—a Cyclical and Structural Analysis*. New York: NBER.
- Zarnowitz, Victor, and Charlotte Boschan. 1975a. "Cyclical Indicators." *55th Annual Report*, National Bureau of Economic Research (September).
- . 1975b. "Cyclical Indicators: An Evaluation and New Leading Indexes." *Business Conditions Digest*, May.
- . 1975c. "New Composite Indexes of Coincident and Lagging Indicators." *Business Conditions Digest*, November.
- . 1977. "Cyclical Indicators." *57th Annual Report*, National Bureau of Economic Research (September).