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Slowdowns, Recessions, and Inflation: Some Issues and Answers

ABSTRACT: According to the criteria used for many years by the National Bureau of Economic Research to identify business cycles, the United States entered upon its sixth recession since World War II in November 1973. Uncertainty about the depth, duration, and scope of the decline persisted for many months thereafter, partly because some indicators such as real GNP slumped rapidly and continuously during 1974, while others, such as total employment and industrial production, did not. Sharp deterioration in virtually all major indicators after October 1974 clinched the matter. A system of monthly measurements designed to compare an incipient recession or slowdown as it develops with earlier recessionary periods is described and illustrated. An analysis of slowdowns and speedups in economic growth reveals that they have invariably been associated with reductions and advances in the rate of inflation. The factors responsible for the reductions appear, however, to have become less effective in recent years and to operate with a longer lag.

ACKNOWLEDGMENT: I am indebted to Walter Ebanks for development of the index of physical volume indicators and for other assistance during the course of the project reported here. I am grateful also to Charlotte Boschan, Otto Eckstein, Solomon Fabricant, Harold Halcrow, John Meyer, and Edward Smith for their useful comments and suggestions, to Felix Anderson and H. Irving Forman for the charts, to Mildred Courtney and James Hayes for their patient handling of successive drafts of the manuscript, and to Jane Forman for editing the final one.

NOTE: This paper was prepared at the end of December 1974, when the latest data available for most economic indicators pertained to November. Rather than update the text and tables a new section VII has been added discussing more recent data.

II) INTRODUCTION AND SUMMARY

Despite all the talk during 1974 on whether the nation was or was not in a recession, rather little attention was paid to the question in what respect the current slowdown was more serious or less serious than those in the past, and by how much. This question obviously is more important, especially for policy-making purposes, than the much debated point of whether the slowdown should be designated a recession. An answer to the more important question is essential if a reasonably objective answer is to be given to the terminological one.

Furthermore, the answer to the question about relative severity has a bearing upon another matter of great concern—the rate of inflation. Previous experience has something important to tell us about the relation between slowdowns, recessions, and inflation.

Since the autumn of 1973 a systematic comparison of the current slowdown with earlier ones has been conducted on a continuing basis. This is an extension of similar studies made during the recession of 1969–1970, as well as during the recessions of 1960–1961 and 1957–1958.¹ In capsule form the principal findings are:

1. A slowdown in the rate of economic growth began in the spring of 1973. In late autumn of 1973 the slowdown became an actual decline in the physical volume of aggregate economic activity. Until the autumn of 1974 the decline was relatively modest by some measures of activity, but more severe by others. Beginning in the autumn, all major physical indicators declined sharply.
2. Indicators showing a modest decline in comparison with previous recessions during the first three quarters of 1974 include the index of industrial production, the number of persons employed, and the total hours they worked. A new composite index based entirely upon indicators expressed in physical units also showed a relatively modest decline through October 1974. Indicators showing relatively sharp declines at an earlier date include the gross national product in constant dollars and retail sales in constant dollars.
3. Because of the discrepancy between measures of activity based upon physical units and those obtained by adjusting current dollar aggregates for price changes, it was unusually difficult, during most of 1974, to determine whether the current decline did or did not exceed the mildest of previous recessions. However, in the autumn of 1974 further weakness developed in most "leading indicators," in employment, and in virtually all other measures of the physical volume of aggregate activity. The scope of the decline widened. These developments made it reasonable, late in the year, to conclude that the period was sufficiently similar in depth of

decline, in duration and in scope, to warrant designating it a business cycle contraction, or recession.

4. The business cycle peak date that seems best supported by the evidence on the physical volume of economic activity is November 1973. This date was initially selected on a provisional basis early in 1974. Subsequent evidence generally confirms the original choice. Some measures of activity, notably retail sales in constant dollars and the rate of unemployment, reached their highs (lows in the case of unemployment) before November 1973 while others, notably employment, reached their highs later, but the consensus centers on November or the fourth quarter of 1973. The selection of this date, even though the subsequent level of activity was influenced in part by the imposition and removal of the oil embargo, is consistent with earlier practice in determining turning points in business cycles.

5. The high rate of inflation that persisted during the 1973–1974 slowdown and recession had two unusual consequences. One is that it brought about a continued rise in measures of activity, such as gross national product, that are expressed in current or nominal dollars, even while measures of physical activity were declining. A second is that it created uncertainty about the accuracy of the procedures used to eliminate the effect of price changes on sales and inventories, and hence on the measures of output derived in this manner.

6. Since 1948 slowdowns in economic growth have invariably been accompanied by reductions in the rate of inflation, while recoveries in growth have been accompanied by a speedup in inflation. The factors responsible for the reductions appear, however, to have become less effective in recent years and to operate with a longer lag. This tendency seems to be responsible, at least in part, for the persistence of high and rising rates of inflation during the 1973–1974 slowdown and recession. Nevertheless, the peak rate of inflation appeared to have been reached in the autumn of 1974, and a decline in accord with historical experience seemed to have begun.

(III) COMPARISONS WITH EARLIER RECESSIONS

The main idea behind the present study has been to measure the changes in specific indicators, month by month, as new figures become available, and compare them with corresponding measurements taken at comparable points of time in previous recessions or slowdowns. In this way the relative severity of declines during the current period can be determined, and other similarities or differences in the character of the current and earlier periods can be analyzed.

Table 1 and Chart 1 show how this has been done for one broad index

**TABLE 1 Ranking of Seven Periods of Recession in Successive Months, 1948-1974:
Index of Five Coincident Indicators, Deflated**

Months After Business Cycle Peak	Business Cycle Peak Date ^a							Average, Five Recessions Omitting 1967 and 1973
	Nov. 1973	Nov. 1969	Jan. 1967	May 1960	July 1957	July 1953	Nov. 1948	
1	-0.7 (Dec.)	-0.3	0.0	-0.7	+0.4	-0.7	-0.9	-0.4
2	-1.9 (Jan.)	-1.5	+0.3	-1.0	-1.1	-2.2	-3.1	-1.8
3	-2.1 (Feb.)	-1.6	+0.8	-1.5	-1.8	-2.8	-4.3	-2.4
4	-2.0 (Mar.)	-1.7	+0.9	-1.5	-4.0	-5.2	-5.4	-3.6
5	-1.9 (Apr.)	-1.5	+1.5	-2.7	-5.6	-8.1	-6.6	-4.9
6	-1.9 (May)	-2.2	+1.9	-3.5	-7.6	-9.5	-8.3	-6.2
7	-2.3 (June)	-2.5	+3.0	-5.2	-9.7	-10.9	-10.0	-7.1
8	-2.1 (July)	-2.5	+3.1	-5.2	-11.0	-11.3	-9.1	-8.3
9	-2.5 (Aug.)	-2.7	+2.4	-5.7	-12.6	-11.5	-7.7	-7.8
10	-2.9 (Sept.)	-3.2	+4.6	-4.5	-12.1	-10.9	-12.3	-8.7
11	-3.3 (Oct.)	-5.3	+5.8	-4.2	-10.8	-11.3	-9.4	-8.0
12	(Nov.)	-6.4	+6.2	-3.0	-9.7	-11.3	-9.4	-8.0

		Ranking According to Size of Per Cent Decline ^a				Correlation with Ultimate Severity, Six Recessions Omitting 1973 ^d	
1	5	3(3)	2(2)	5(4.5)	1(1)	5(4.5)	7(6)
2	5	4(4)	1(1)	2(2)	3(3)	6(5)	7(6)
3	5	3(3)	1(1)	2(2)	4(4)	6(5)	+1.00
4	4	3(3)	1(1)	2(2)	5(4)	6(5)	+1.00
5	3	2(2)	1(1)	4(3)	5(4)	7(6)	+0.89
6	2	3(2)	1(1)	4(3)	5(4)	7(6)	+0.89
7	2	3(2)	1(1)	4(3)	6.5(5.5)	6(5)	+0.75
8	2	3(2)	1(1)	4(3)	7(6)	6(5)	+0.71
9	2	3(2)	1(1)	4(3)	7(6)	6(5)	+0.71
10	2	2(2)	1(1)	4(3)	7(6)	6(5)	+0.71
11	2	4(3)	1(1)	3(2)	5(4)	6(5)	+1.00
12		(3)	(1)	(2)	(5)	(6)	+0.82

Ranking of Six Recessions According to Ultimate Severity^e

(3)	(1)	(2)	(4)	(5)	(6)
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NOTE: The index of five coincident indicators includes nonfarm employment, unemployment rate (inverted), industrial production, deflated personal income, deflated manufacturing and trade sales. The index is published as Series 825 in *Business Conditions Digest*, U.S. Department of Commerce.

^aDates for 1948-1969 are from the National Bureau's business cycle chronology except for 1967, which is included as an example of a "mini-recession." The November 1973 peak is provisional and is used only for the purpose of testing the hypothesis that a business cycle peak may have been reached.

^bPercent changes are computed on the base of the three-month average centered on the business cycle peak month. The base for the current period (average for October, November, and December 1973) is 141.4 (1967 = 100).

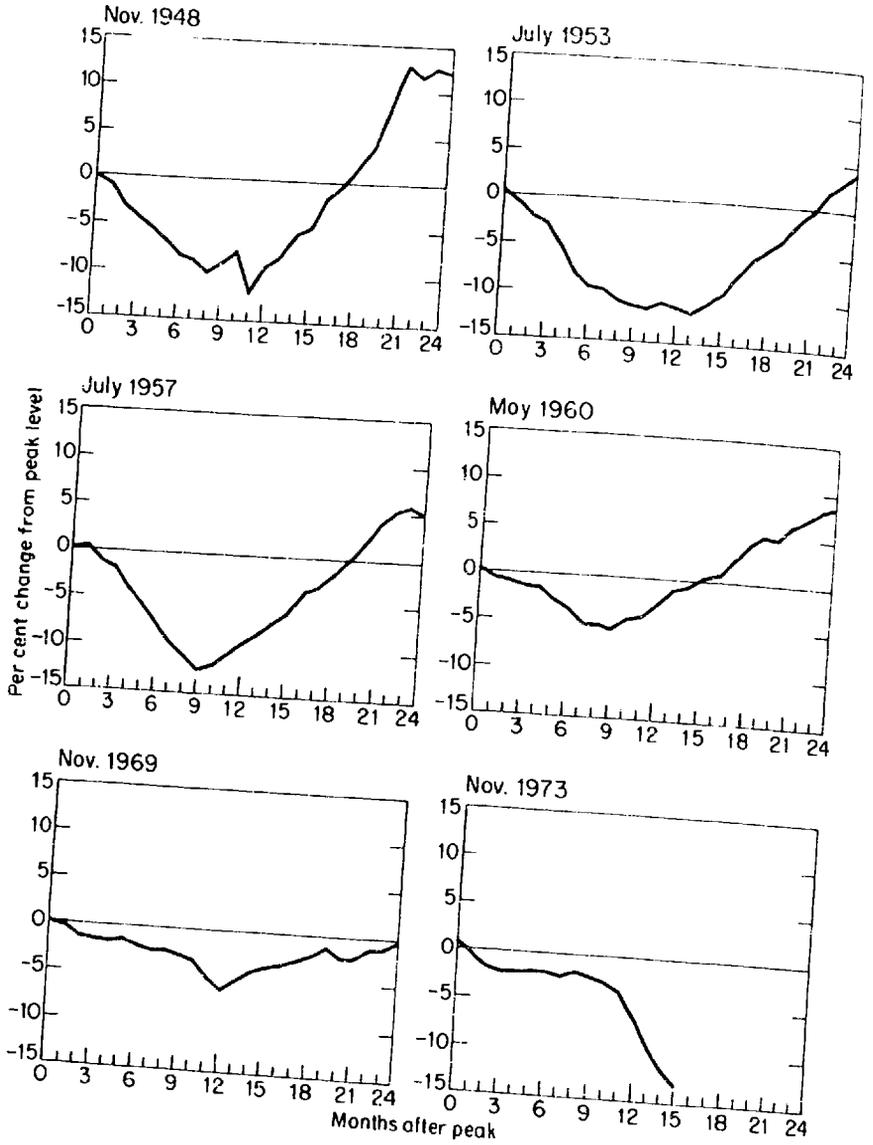
^cA rank of 1 means that the percentage decline is the smallest among the seven recessions over the corresponding interval; a rank of 7 means that it is the largest. Ranks shown in parentheses omit the 1973-1974 period and hence are comparable with the ranks of ultimate severity (bottom line).

^dUsing ranks shown in parentheses. For six ranks the correlation coefficient should exceed 0.83 to be significant at the 0.05 level.

^eUltimate severity is measured by the per cent decline from high to low in a trend-adjusted composite index based on 12 physical volume aggregates (e.g., industrial production, nonfarm employment, real GNP, etc.). These per cent declines are: 1969-1970, -10.2; 1966-1967, -3.0; 1960-1961, -8.5; 1957-1958, -15.5; 1953-1954, -17.2; 1948-1949, -17.5.

^fBusiness cycle trough date. In 1953-1954 the trough is in the 13th month, August 1954. The trough of the 1967 "mini-recession" is in the 4th month, May 1967.

CHART 1 Recession Patterns: Index of Coincident Indicators, Deflated



of the physical volume of economic activity. The index includes most of the commonly used monthly aggregates: industrial production, nonfarm employment, the unemployment rate (taken inversely, so that a decline in the rate is recorded as an improvement and vice versa), personal income deflated by a price index for consumer expenditures, and total business sales (manufacturers', wholesalers', and retailers') deflated by appropriate

price indexes. They are combined in this index in such a way that each of the five components has an equal chance, on the average, to influence the movements of the index (otherwise one component that ordinarily moves in large swings, such as business sales, could swamp another one that typically moves in a narrower range, say nonfarm employment).

Each of the past recessions has been dated in earlier studies by the National Bureau and the chronology has been generally accepted as reasonably accurate, both as to the time the recessions began and ended and as to whether the designated periods were recessions and other periods were not.² One marginal case is included in the table, namely 1966–1967. This has not been designated a recession because it was so mild and brief, but it is included in the table for comparative purposes as one episode that failed to meet the criteria for recessions. It was a period of slowdown and earned the name "mini-recession" at the time. In some other countries, such as West Germany, it was more serious.

The date for the beginning of the current period, November 1973, was designated provisionally at the time this study was begun and did not imply any conclusion or forecast with regard to whether the ensuing period would be a recession or not. It was selected early in 1974 as a *possible* business cycle peak date on the basis of evidence then available, but it was recognized that subsequent evidence might either shift the date or support a conclusion of no recession. For example, it is now known that nonfarm employment, one of the series that obviously has some bearing on the existence and dating of a recession, continued to rise slowly but rather steadily until October 1974. Nevertheless, the experiment began with the November 1973 peak date and, as will be seen, the evidence now available confirms this date as a reasonable choice.

The table then records the percentage changes in the index from the several peak dates. Note that the dates are not necessarily the same as the peak dates in the index itself, although in this particular index the deviations are not great (the index peaked one to four months earlier at each turn except in 1967, where it did not decline at all, and in November 1973, where its peak coincided with the selected date).³ In the first month or two not much can be said, because changes over one or two months in any series are likely to be erratic and can be dominated by factors such as strikes or bad weather. But it is clear that in each of the previous recessions, with the exception of 1966–1967, the index declined as time went on. The average for the five recessions, omitting 1966–1967, shows a drop of nearly 2½ per cent in three months and 6 per cent in six months.⁴ From November 1973 to February 1974 the index dropped rapidly, i.e., at about the average rate, as the energy crisis hit the economy. After February it held steady through July, then it began to decline again. The 3½ per cent decline in the eleven months from November 1973 to October 1974 was

less than half as large as the average decline in the five previous recessions over the same interval, and smaller than in any one of them.

The ranking of the several recessions (bottom panel in the table) shows a further interesting result. The ranks have usually remained relatively stable after the first month or two. Moreover, the ranks in successive months are positively correlated with the ultimate ranks. The latter can of course only be determined after the recession is over and an upswing has begun. In the third and fourth months, in fact, the ranks for the previous six recessionary periods (now including 1966-1967) were exactly the same as the ultimate ranks. This was rather fortuitous, however, since in the next few months the correlation deteriorated. Nevertheless, there is a positive correlation throughout (see the right-hand column in the table). The point is that ordinarily one can get some rough clue to the ultimate severity of a recession from how severe it appears in the first few months. The initial indications are, of course, subject to correction as time goes on.

The current period, on this basis, started out with a relatively sharp decline, and ranked fifth in the first three months (through February 1974). This was clearly attributable, at least in part, to the oil embargo. The declines were greater than in any of the recessions except 1953-1954 and 1948-1949. Then the position improved, and from May through October the current period ranked second, i.e., worse than 1966-1967 but milder than any of the other recessions. However, the percentage declines through October 1974, the eleventh month, were very close to those for 1969-1970, one of the mildest of the five recessions since World War II.

These results are compared with those based upon other available measures of the physical volume of economic activity in Table 2. The current declines in GNP and in retail sales, both expressed in real terms, i.e., after deflation for price changes, are larger than in most of the earlier recession periods. But this is not true of the industrial production index, where the decline through November was smaller than in any previous recession period except the "mini-recession" of 1967. Nonfarm employment, i.e., the number on payrolls of nonfarm establishments, was higher in November 1974 than at the tentative business cycle peak a year earlier, whereas it was lower after the first year in each of the previous recessions (except, again, the 1967 "mini-recession"). Total civilian employment, based upon a separate survey of households, showed a similar ranking. The unemployment rate in November (6.5 per cent) was at a higher level than in several earlier recessions, but the increase in the rate during the preceding twelve months (1.8 percentage points) was smaller than its increase in any previous recession (except, again, 1967). The increase in the rate, incidentally, is highly correlated with the ultimate severity rankings of the recessions; the level is not.⁵

It appears, then, that the measures of activity that are estimated in terms

of current dollars (from reported sales, inventories, exports, imports, etc.), and then deflated by price indexes, presented a decidedly less favorable picture relative to previous experience in the current period than did the measures of physical activity obtained directly. It is of some interest, therefore, to examine a composite index of physical activity that is based entirely on measures that are *not* obtained by deflating value data for price changes. Walter Ebanks has constructed such an index using five components, namely, index of industrial production, manhours of nonfarm employment, unemployment rate (inverted), railroad freight carloadings, and tonnage of shipments by truck. The method of construction is the same as that used in the index shown in Table 1, so the average rate of change in this index is also 1 per cent per month.⁶

Between November 1973 and September 1974 this index declined 4.9 per cent (see Table 2). This is somewhat smaller than its decline over the first 10 months of the 1969–1970 recession, and decidedly smaller than its decline during the recessions of 1960–1961, 1957–1958, 1953–1954, and 1948–1949.

The above measurements represent only one way of comparing current economic changes with previous experience. They concentrate attention on their size relative to changes over corresponding intervals in previous recessions. They do not show readily how the current decline in any indicator to date compares with its *total* decline in previous recessions. This is of little interest early in a recessionary period, but becomes more relevant as time goes on. Furthermore, the criteria used by the NBER in identifying business cycle contractions include not only their depth, but also how long the declines last and how widely diffused they are among different industries or other economic sectors.

Table 3 gives a conspectus of such measurements back to 1920. The extraordinary depth, duration, and diffusion of the 1929–1932 contraction stands out, as well as the severity of the 1920–1921 and 1937–1938 contractions. None of the recessions since World War II have approached these magnitudes. Among the milder recessions in the past half-century are those of 1926–1927, 1960–1961, and 1969–1970.

The entries in the column headed November 1973 are not, of course, final, since the declines are recorded only as they stood at the time the table was constructed (December 1974), not as they may eventually become (see Section VII for a later version). The conflicting nature of the evidence on the current decline is nevertheless apparent once again. In terms of real GNP, the 2.7 per cent decline in the first three quarters of 1974 exceeded the total drop registered in several earlier recessions, in both duration and magnitude. On the other hand, the corresponding decline in industrial production was smaller than in any previous recession. Nonfarm employment rose until September 1974; by November it

TABLE 2 Ranking of Seven Periods of Recession After 9-12 Months, 1948-1974

Indicator	Months after Peak	Nov. 1973	Business Cycle Peak Date					July 1953	Nov. 1948	Average, Five Recessions Omitting 1967 and 1973
			Nov. 1969	Jan. 1967	May 1960	July 1957	July 1953			
GNP in constant dollars	9	-2.7 (3rd q.)	+0.3	+1.6	-1.4	-3.4	-3.2	-0.8	-1.7	
Retail sales, deflated	11	-4.3 (Oct.)	+0.8	+1.3	-3.9	-4.4	+2.0	+3.4	-0.4	
Industrial production	12	-3.9 (Nov.)	-7.1	+3.6	-1.6	-8.0	-7.8	-6.2	-6.1	
Nonfarm employment, payroll survey	12	+0.7 (Nov.)	-1.3	+2.3	-1.3	-3.9	-3.3	-4.2	-2.8	
Total employment, household survey	12	+0.1 (Nov.)	0.0	+2.0	-0.9	-2.3	-2.8	-0.9	-1.4	
Unemployment rate, level	12	6.5 (Nov.)	5.8	3.7	7.1	7.5	5.8	6.4	6.5	
Unemployment rate, change	12	+1.8 (Nov.)	+2.2	-0.1	+1.9	+3.3	+3.2	+2.6	-2.6	
Index, 5 coincident indicators, deflated	11	-3.3 (Oct.)	-5.3	+5.8	-4.2	-10.8	-10.9	-12.3	-8.7	
Index, 5 physical volume indicators	10	-4.9 (Sept.)	-6.7	-1.1	-8.5	-17.3	-13.3	-12.5	-11.7	

TABLE 3 Selected Measures of Duration, Depth, and Diffusion of Business Cycle Contractions, Peak to Trough, 1920 to 1974

Indicator	Peak and Trough of Business Cycle Contractions											
	Jan. 1920	May 1923	Oct. 1926	Aug. 1929	May 1937	Feb. 1945	Nov. 1948	July 1953	July 1957	May 1960	Nov. 1969	Nov. 1973 ^e
Business cycle chronology	18	14	13	43	13	8	11	13	9	9	12	n.a.
GNP, current dollars	n.a.	6	12	42	9	6	12	12	6	6	12	n.a.
GNP, constant dollars	n.a.	3	3	36	6	n.a.	6	12	6	6	15	c
Industrial production	14	14	8	36	12	27	15	8	14	13	14	9
Nonfarm employment	n.a.	n.a.	n.a.	43	11	22	13	16	14	10	8	2
	Duration (months)											
GNP, current dollars	n.a.	-4.9	-3.0	-49.6	-16.2	-11.9	-3.4	-1.9	-2.6	-0.3	c	c
GNP, constant dollars	n.a.	-4.1	-2.0	-32.6	-13.2	n.a.	-1.9	-3.4	-3.9	-1.6	-1.5	-2.7
Industrial production	-32.4	-17.9	-7.0	-53.4	-32.4	-38.3	-9.9	-10.0	-14.3	-7.2	-8.1	-4.3
Nonfarm employment	n.a.	n.a.	n.a.	-31.6	-10.8	-10.1	-5.2	-3.4	-4.3	-2.2	-1.6	-0.6
Unemployment rate:												
Maximum	11.9 ^d	5.5 ^d	4.4 ^d	25.2 ^d	20.0	4.3	7.9	6.1	7.5	7.1	6.1	6.5
Increase	+10.3 ^d	+2.6 ^d	+2.4 ^d	+22.0 ^d	+9.0	+3.4	+4.5	+3.6	+3.8	+2.3	-2.7	+1.9
	Depth ^a (per cent)											
Nonfarm industries:												
Maximum percentage ^b	97	95	71	100	97	n.a.	90	87	88	82	83	60
with declining employment ^b	Sept. '20	Apr. '24	Nov. '27	June '33	Dec. '37		Feb. '49	Mar. '54	Sept. '57	Aug. '60	June '70	Aug. '74
	Diffusion (per cent)											

SOURCE: U.S. Department of Commerce, U.S. Department of Labor, Board of Governors of the Federal Reserve System, National Bureau of Economic Research. For a fuller version of this table, see Solomon Fabricant, "The 'Recession' of 1969-1970," in Victor Zarnowitz, ed., *The Business Cycle Today*, New York, NBER, 1972, pp. 100-110.

NOTE: n.a. indicates not available.

*Percentage change from the specific peak month or quarter in the series to the trough month or quarter, over the intervals shown above. For the unemployment rate, the maximum figure is the highest for any month during the contraction and the increases are from the lowest month to the highest, in percentage points.

^bSince 1948, based on changes in employment over six-month spans in 30 nonagricultural industries, centered on the fourth month of the span. Hence the 60 per cent dated August 1974 means that 18 of the 30 industries had declines in employment, after seasonal adjustment, over the six months May to November 1974. Prior to 1948 based on cyclical changes in employment in 41 industries.

^cNo decline.

^dThe maximum figures are annual averages (monthly data not available) for 1921, 1924, 1928, and 1933; increases, in percentage points, are for 1919-1921, 1923-1924, 1926-1928, 1929-1933.

^eEntries are based on data available through November 1974 and hence show only the decline in the series to the lowest point reached to date.

was six-tenths of 1 per cent below the September level, a small drop compared with its full decline in previous recessions. The unemployment rate had reached a level exceeding the maximum level reached in several earlier recessions, but the increase in the rate to November 1974 from its previous low in October 1973 was less than its total rise in any earlier recession.⁷

Finally, the relatively narrow scope of the current decline through November 1974 is recorded in the fact that the proportion of industries with declines in employment had not exceeded 60 per cent, whereas in most previous recessions this percentage had climbed to 80 or 90 per cent. Until the autumn of 1974 relatively few industries had experienced reductions in employment. In this respect, the situation resembled that during the 1967 mini-recession, when the percentage of industries with declining employment (over six month spans) rose to 62 per cent, but no higher.

As of December 1974, therefore, the evidence concerning the relative severity of the current decline in aggregate economic activity was conflicting. Although unemployment had risen to recession levels, the increase in unemployment was smaller than in preceding recessions. The decline in industrial production and in the number of persons employed also was modest. A composite measure of activity based upon physical units, which require no adjustment for price changes, showed a decline approaching—but less than—that in the mildest of the postwar recessions. Only those aggregate measures constructed from dollar values deflated for price changes, such as real GNP, showed declines that approached the severity of the worst of the recessions since 1948.

In view of the rapidity of price increases in 1974, and the difficulty of being sure that the prices that are implicit in the reported value data are the same as, or at least are well represented by, those contained in the available price indexes, it seems possible that the deflated value figures were unduly depressed. Under more normal conditions, when the swings in output are usually far larger than in prices, errors in the price deflation process are of no great consequence. For example, when the prices reflected in sales are set by contract some months before, it may make little difference to an estimate of the physical volume represented by the sales if one is not sure about the advance dating, *provided* prices are not radically changing. But when they are changing rapidly, knowledge of the length of the contract period and knowledge of whether or not the contract price is escalated may be of critical importance. Similarly, the estimation of the physical volume of inventories—required to derive estimates of output—is exceptionally difficult when prices are changing rapidly and methods of valuing inventories may also be changing. The uncertainty surrounding these estimates is indicated by the enormous revisions in the inventory figures for 1973 and early 1974, which more than doubled the estimated rate of inventory accumulation.

These uncertainties may take years to untangle. But they point to the need for basic improvements in the data themselves, as well as in our ways of monitoring discrepancies when they arise. Such improvements could bring lasting benefits to our system of economic intelligence and prevent substantial inconsistencies of the kind that developed during 1974.⁸

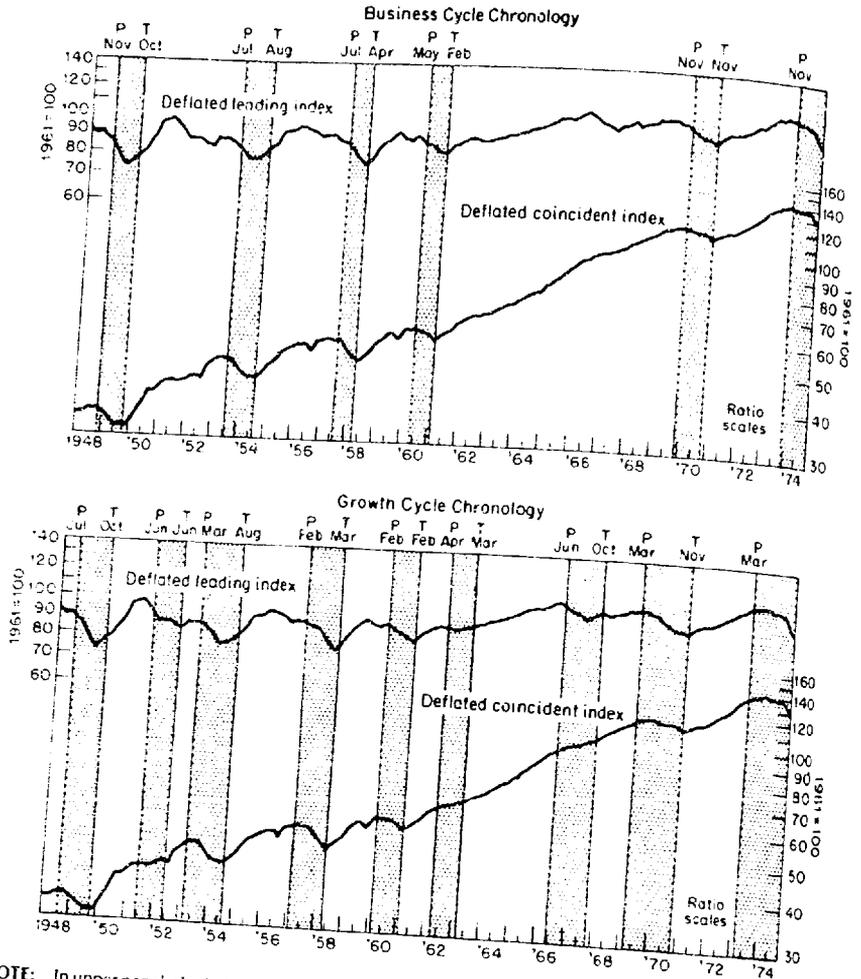
[III] THE CURRENT SLOWDOWN IN THE CONTEXT OF GROWTH CYCLES

In recent years some of the business cycle studies at the National Bureau have been directed toward implementing a concept of the business cycle that differs in important respects from the one employed above. The new concept, termed the growth cycle, is perhaps more pertinent to the milder type of economic fluctuation that the United States and other industrial countries have been experiencing since World War II. Ilse Mintz began the work by developing a growth cycle chronology for West Germany, 1950–1967, and more recently for the United States, 1948–1970. Still more recently, Philip A. Klein constructed a similar chronology for the United Kingdom, 1950–1972.⁹ The research on international economic indicators begun by the NBER last year will make extensive use of the growth cycle concept for all the industrial countries included in the study, by applying a standard set of techniques to comparable data for each country.

Growth cycles are alternating periods of slow and rapid economic growth. They differ in two major respects from the business cycles heretofore identified by the NBER. First, a slowdown may or may not encompass a business cycle contraction, i.e., a period of actual decline in aggregate economic activity. Second, a slowdown may start prior to an actual downturn in aggregate economic activity, and end after the upturn. Dr. Mintz's study for the United States illustrates both types of difference. Her growth cycle chronology includes eight slowdowns between 1948 and 1970, whereas there are only five business cycle contractions (or recessions). Five of the eight slowdowns encompass the five recessions, starting a few months earlier in each case but ending at about the same time. The other three slowdowns—in 1951–1952, 1962–1963, and 1966–1967—interrupted expansion phases but did not entail a sustained decline in activity, merely a markedly slower rate of growth for periods of a year or more. Chart 2 shows the relation between these two chronologies and how they fit the experience recorded by two of the indexes used in this study.

The ninth slowdown began early in 1973, bringing to an end the period of rapid growth that began toward the close of 1970. The peak date tentatively is March 1973, or on a quarterly basis, the first quarter. Like the earlier slowdowns, this one began well before any decline in aggregate

CHART 2 Business Cycles and Growth Cycles, 1948-1974



NOTE: In upper panel, shaded areas are business cycle contractions. In lower panel, shaded areas are growth cycle slowdowns. Both panels contain the same indexes.

activity became apparent, antedating by eight months the designated business cycle peak of November 1973 discussed above. The current slowdown can be compared with the eight earlier ones by the same technique used above to compare business cycle contractions. Table 4 illustrates the method for the same series used in Table 2. Data for October and November 1974 represent the 19th and 20th months of the current slowdown, respectively. By that time all of the indicators represented in the table were more depressed than at the corresponding date in any of the three milder slowdowns, i.e., those that did not encompass recessions. With respect to the five slowdowns that did encompass recessions,

sions, the current slowdown appeared mild when measured by industrial production or employment or by the rise in unemployment, but serious when measured by real GNP, deflated retail sales, or the level of unemployment.

Since tables like Table 4 could be and were constructed as soon as a tentative date was established for the start of the current slowdown, and updated month by month thereafter, the comparative position of the current slowdown could be monitored continuously. Since the peak dates of the slowdowns precede the business cycle peaks, by intervals ranging from 3 to 8 months, earlier recognition of the relative severity of a current slowdown may be possible. Also, the wider range of experience covered by the growth cycle chronology is an advantage. For example, it became clear early in 1974 that the 1973-1974 slowdown was more serious than the three minor slowdowns of 1951-1952, 1962-1963, and 1966-1967. On the other hand, for many months thereafter, the evidence was conflicting as to the position of the current slowdown among the five previous slowdowns that encompassed recessions. Measures of activity based upon physical units registered relatively slight declines, whereas measures based upon dollar values deflated for price changes registered substantial declines. The possible reasons for this anomaly have been discussed above.

It should be noted that none of the previous slowdowns lasted more than 20 months, and most were within the range of a year to a year and a half in length. Hence, the 20 month period from March 1973 to November 1974 is at the long end of the range. In most of the previous slowdowns the various measures of aggregate economic activity by the 20th month had begun to register upturns, but such a development had not become apparent by the 20th month of the current slowdown. This is another way to judge the relative severity of a current slowdown.

[IV] LEADING INDICATORS IN 1973-1974

The preceding discussion has concentrated upon measures pertaining to the "real" economy. It was here, of course, that the evidence of recession could first be observed. Aggregates expressed in current dollars, such as GNP, total business sales, and personal income continued to rise during 1974, though at a somewhat slower pace than in 1973. General indexes of prices, wages, and unit labor costs rose at an unprecedented pace. The divergence between the current dollar aggregates and measures of the physical volume of activity is one feature that distinguishes the current decline from most previous recessions, at least prior to 1969. In most previous recessions both nominal and real aggregates have declined at

TABLE 4 Ranking of Nine Periods of Economic Slowdown After 18-20 Months, 1948-1974

Indicator	Months After Peak	Current Slowdown					Growth Slowdowns Without Recessions					Growth Slowdowns With Recessions					Average, 5 Slowdowns with Recession
		March 1973	June 1966	April 1962	June 1951	Mar. 1969	Feb. 1960	Feb. 1957	Mar. 1953	July 1948	Mar. 1953	Feb. 1957	July 1948				
		Peak Dates															
GNP in constant dollars	18	-1.2(Q3)	+4.4	+6.5	+6.2	+0.7	+2.3	-0.6	-1.2	+4.2	+1.1	+1.5	+1.4	+1.5			
Retail sales, deflated	19	-7.6 (Oct.)	+4.0	+4.8	+11.3	-0.4	0.0	-1.5	0.0	+8.7	-1.4	-0.6	-2.6	-1.5			
Industrial production	20	-1.4 (Nov.)	+6.0	+9.0	+12.3	-6.6	+1.4	-5.0	-4.3	-0.6	-2.5	-2.3	-1.7	-0.5			
Nonfarm employment, payroll survey	20	+3.0 (Nov.)	+4.9	+3.4	+5.0	+0.3	+0.1	-3.0	-2.5	-2.6	-1.5	-0.6	-1.5				
Total employment, household survey	20	+2.5 (Nov.)	+3.5	+2.5	+3.2	+1.5	+1.1	-1.0	-2.3	-1.7	-0.5	-0.6	-0.5				
Unemployment rate, level	20	+6.5 (Nov.)	+3.8	+6.5	+2.6	+5.8	+6.5	+6.7	+5.3	-6.3	+6.1	+6.7	+6.1				
Unemployment rate, change	20	+1.5 (Nov.)	0.0	-0.1	-0.5	+2.4	+1.4	+2.8	-2.7	-2.6	+2.4	+2.8	+2.4				
Index, 5 coincident indicators, deflated	19	+0.3 (Oct.)	+10.0	+9.2	+14.2	-3.3	+0.1	-7.9	-9.4	-5.2	-5.1	-9.4	-5.2				
Index, 5 physical volume indicators	18	-0.2 (Sept.)	+2.8	+6.6	+7.2	-5.4	-4.1	-14.9	-13.6	-12.9	-10.2	-14.9	-10.2				

Correlation
with
Ultimate
Severity,
8
Slowdowns^c

	Ranking According to Size of Per Cent Decline ^b										
GNP in constant dollars	18	8.5	3(3)	1(1)	2(2)	6(6)	5(5)	7(7)	8.5(8)	4(4)	+74
Retail sales, deflated	19	9	4(4)	3(3)	1(1)	7(7)	5.5(5.5)	8(8)	5.5(5.5)	2(2)	+28
Industrial production	20	6	3(3)	2(2)	1(1)	9(8)	5(4)	8(7)	7(6)	6(5)	+69
Nonfarm employment, payroll survey	20	4	2(2)	3(3)	1(1)	5(4)	6(5)	9(8)	7(6)	8(7)	+81
Total employment, household survey	20	3.5	1(1)	3.5(3)	2(2)	5(4)	6(5)	7(6)	9(8)	8(7)	+88
Unemployment rate, level	20	7.5	2(2)	4(4)	1(1)	5(5)	7.5(7)	9(8)	3(3)	6(6)	+45
Unemployment rate, change	20	5	3(3)	2(2)	1(1)	6(5)	4(4)	9(8)	8(7)	7(6)	+83
Index, 5 coincident indicators, deflated	19	4	2(2)	3(3)	1(1)	6(5)	5(4)	8(7)	9(8)	7(6)	+83
Index, 5 physical volume indicators	18	4	3(3)	2(2)	1(1)	6(5)	5(4)	9(8)	8(7)	7(6)	+83
			(2)	(1) ^e	(3)	(5)	(4)	(6)	(7)	(8)	

Ranking According to Ultimate Severity^d

NOTE: Peak dates for 1948-1969 are from Ilse Mintz, "Dating United States Growth Cycles," *Explorations in Economic Research*, Summer 1974, Table 8, and pertain to the concept of "deflated deviation cycles." The March 1973 peak is tentative.

^aPer cent changes are computed on the base of the three-month average centered on the growth cycle peak month.

^bA rank of 1 means that the percentage decline is the smallest (or rise the largest) among the nine slowdowns over the corresponding interval; a rank of 9 means that it is the largest decline. Ranks shown in parentheses omit the 1973-1974 period and hence are comparable with the ranks of ultimate severity (bottom line).

^cUsing ranks shown in parentheses, the correlation coefficient should exceed 0.64 to be significant at the 0.05 level.

^dUltimate severity is measured by the per cent decline from high to low in a trend-adjusted composite index based on 12 physical volume aggregates (e.g., industrial production, nonfarm employment, real GNP, etc.). These per cent declines are: 1966-1970, -3.0; 1962-1963, -2.8; 1951-1952, -3.8; 1969-1970, -10.2; 1960-1961, -8.5; 1957-1958, -15.5; 1953-1954, -17.2; 1948-1949, -17.5.

virtually the same time (see Table 3), as a result of relatively sharp declines in the real magnitudes and moderate increases or small declines in prices and wages. In 1969–1970 and again in 1973–1974, the declines in real magnitudes have been slight compared with the increases in prices and wages. Hence, aggregates expressed in current dollars continued to rise for many months after the downturn began in “real” terms.

In view of this divergence it has become important, in using early warning indicators of economic change, to distinguish those expressed in physical (or deflated value) units from those expressed in current dollars. An increase in the current dollar volume of new orders, for example, will not portend an increase in the physical volume of output if the increase in orders is entirely attributable to an increase in prices. Again, the significance of a buildup in inventories that primarily reflects a rise in the prices at which goods are valued is very different from one that reflects an addition to physical quantities on the shelves. Conversely, a decline in the number of housing starts may not portend a decline in residential construction expenditures if it is entirely offset by a rise in costs of construction.

Theoretically, this distinction has always been relevant, but only recently has it become of much practical importance. This is illustrated by the chart that has been carried in the Commerce Department's *Business Conditions Digest* since December 1973, which separates leading indicators expressed in nonmonetary units from those measured in current dollars. An index based on four series in nonmonetary units (average workweek, initial claims for unemployment insurance, net business formation, and building permits for new housing) reached its peak in February and March 1973, declined slowly during the rest of the year, rose slightly during the first half of 1974, but not to its previous peak level, and declined rapidly thereafter. In sharp contrast, an index based on seven series expressed in current dollars (new orders for durable goods, contracts and orders for plant and equipment, corporate profits after taxes, index of stock prices, index of industrial materials prices, change in book value of inventories, and change in consumer instalment debt) climbed almost without interruption throughout 1973 and the first half of 1974, reaching its peak in July, a year and a half later than the other index. Prior to 1973, the two indexes paralleled one another closely in every recession (even including 1969–1970).

In view of the powerful effects of inflation on these indicators in recent years, a National Bureau report by Solomon Fabricant, published in 1972, recommended that the composite of leading indicators published by the Department of Commerce be adjusted for changes in the general price level.¹⁰ In August 1973 the Federal Reserve Bank of Boston began to publish an index of twelve leading indicators all expressed in physical or deflated value units. Statistical Indicator Associates, a private concern, also began issuing a deflated leading index in August 1973. The Department of

Commerce and the National Bureau have likewise experimented with various deflated indexes. All of them showed little or no increase after mid-1973 and declined during 1974. One such index is analyzed in Table 5, after the manner used in Table 1.

Through July 1974 this deflated leading index declined more sharply than in the mini-recession of 1967, but less sharply than in the 1969-1970 recession or any of the earlier ones. After July the picture changed rapidly for the worse. The September 1974 index was lower, relative to its level at the tentative business cycle peak in November 1973, than in any three of the five previous recessions. The October 1974 index was lower than four of the five and equal to the decline in the 1948-1949 recession. Furthermore, in all the earlier recessions except 1969-1970 the index had already begun to rise (see Chart 3).

The deterioration in the relative ranking of this index in Autumn 1974 was unusually sharp. In most earlier recessions the ranking after the first two or three months was maintained quite steadily throughout, although in 1969-1970 there was a similar deterioration when the General Motors strike took place (Autumn 1970). The causes of the sudden shift need further study: the unprecedented increase in interest rates earlier in the year, the sharp drop in the growth of the money supply during the summer, the shift in presidential administrations, the continued rapid rise in prices, and the accompanying deterioration in consumer and business confidence are among the candidates for such a review. But whatever the causes, the effects were registered in virtually all the leading indicators.

Indeed, by September 1974 nearly all leading indicators expressed in current dollars had begun to decline. At the same time, the downturns in the nonmonetary leading indicators that had started much earlier continued. Table 6 contains the record of when the highs in the twelve leading indicators were reached. Relative to the designated business cycle peak of November 1973, which is based on the behavior of physical volume or constant dollar data (see Section V), all four of the nonmonetary leaders and two of the current dollar leaders exhibited leads. The only leaders that did not give early warnings in this period are those expressed in current dollars, but for them, of course, the appropriate comparison is with the peak in the current dollar volume of economic activity. At this writing, that still lies in the future.

[V] DATING THE BUSINESS CYCLE PEAK

In view of (a) the sharp and extended declines in leading indicators expressed in physical units or in constant dollars, (b) the widespread and substantial declines in various measures of the physical volume of aggre-

**TABLE 5 Ranking of Seven Periods of Recession in Successive Months, 1948-1974:
Index of Twelve Leading Indicators, Deflated**

Months After Business Cycle Peak	Business Cycle Peak Date ^a							Average, Five Recessions Omitting 1967 and 1973
	Nov. 1973	Nov. 1969	Jan. 1967	May 1960	July 1957	July 1953	Nov. 1948	
1	-1.5 (Dec.)	-1.0	-1.3	-0.8	-0.3	-1.2	-1.5	-1.0
2	-2.1 (Jan.)	-2.5	-1.7	-1.4	-2.9	-4.5	-5.1	-3.3
3	-1.9 (Feb.)	-3.0	-1.8	-2.4	-5.1	-5.2	-7.1	-4.6
4	-1.6 (Mar.)	-4.1	-1.2	-3.0	-7.2	-7.4	-9.6	-6.3
5	-1.7 (Apr.)	-5.2	+0.2	-4.6	-8.9	-7.4	-12.4	-7.7
6	-2.2 (May)	-5.8	-0.1	-5.8	-10.2	-7.4	-13.5	-8.5
7	-3.2 (June)	-6.1	+1.7	-6.5	-12.3	-6.7	-13.4	-9.0
8	-2.5 (July)	-5.8	+1.5	-6.5	-12.0	-7.4	-12.6	-8.9
9	-4.6 (Aug.)	-6.4	+1.9	-6.1 ^r	-12.4 ^r	-5.8	-10.4	-8.2
10	-7.8 (Sept.)	-7.5	+2.6	-4.2	-10.7	-5.6	-8.4	-7.3
11	-9.6 (Oct.)	-7.7	+1.0	-2.7	-8.3	-4.4	-9.6 ^r	-6.5
12	(Nov.)	-8.2 ^r	+1.7	-1.6	-6.3	-3.2	-8.2	-5.5

Correlation with Ultimate Severity, Six Recessions Omitting 1973^d

Ranking According to Size of Per Cent Decline^e

1	6.5	3(3)	5(5)	2(2)	1(1)	4(4)	7(6)	+14
2	3	4(3)	2(2)	1(1)	5(4)	6(5)	7(6)	+94
3	2	4(3)	2(1) ^d	3(2)	5(4)	6(5)	7(6)	+1.00
4	2	4(3)	1.5(1) ^d	3(2)	5(4)	6(5)	7(6)	+1.00
5	2	4(3)	1(1) ^d	3(2)	6(5)	5(4)	7(6)	+94
6	2	3.5(2.5)	1(1) ^d	3.5(2.5)	6(5)	5(4)	7(6)	+93
7	2	3(2)	1(1) ^d	4(3)	6(5)	5(4)	7(6)	+89
8	2	3(2)	1(1) ^d	4(3)	6(5)	5(4)	7(6)	+89
9	2	5(4)	1(1) ^d	4(3)	7(6)	3(2)	6(5)	+54
10	5	4(4)	1(1) ^d	2(2)	7(6)	3(3)	6(5)	+71
11	6.5	4(4)	1(1) ^d	2(2)	5(5)	3(3)	6.5(6)	+83
12		(5.5)	(1) ^d	(2)	(4)	(3)	(5.5)	+70

Ranking of Six Recessions According to Ultimate Severity^e

(3)	(1) ^d	(2)	(4)	(5)	(6)
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NOTE: Includes average, workweek, manufacturing; initial claims for unemployment insurance; deflated new orders, durable goods; deflated contracts and orders, plant and equipment; building permits, private housing; net business formation; deflated inventory change; ratio, price to unit labor cost, manufacturing; deflated corporate profits after taxes; deflated change in consumer installment credit; ratio, sensitive materials prices to WPI; ratio, stock prices to CPI. These are the same 12 series as in the published index of leading indicators published in *Business Conditions Digest* (series 811), except that here the seven series that are in current dollars are deflated by an appropriate price index.

^aDates for 1948-1969 are from the National Bureau's business cycle chronology except for 1967, which is included as an example of a "mini-recession." The November 1973 peak is provisional and is used only for the purpose of testing the hypothesis that a business cycle peak may have been reached.

^bPer Cent changes are computed on the base of the three-month average centered on the business cycle peak month. The base for the current period (average for October, November, and December 1973) is 112.1 (1967 = 100).

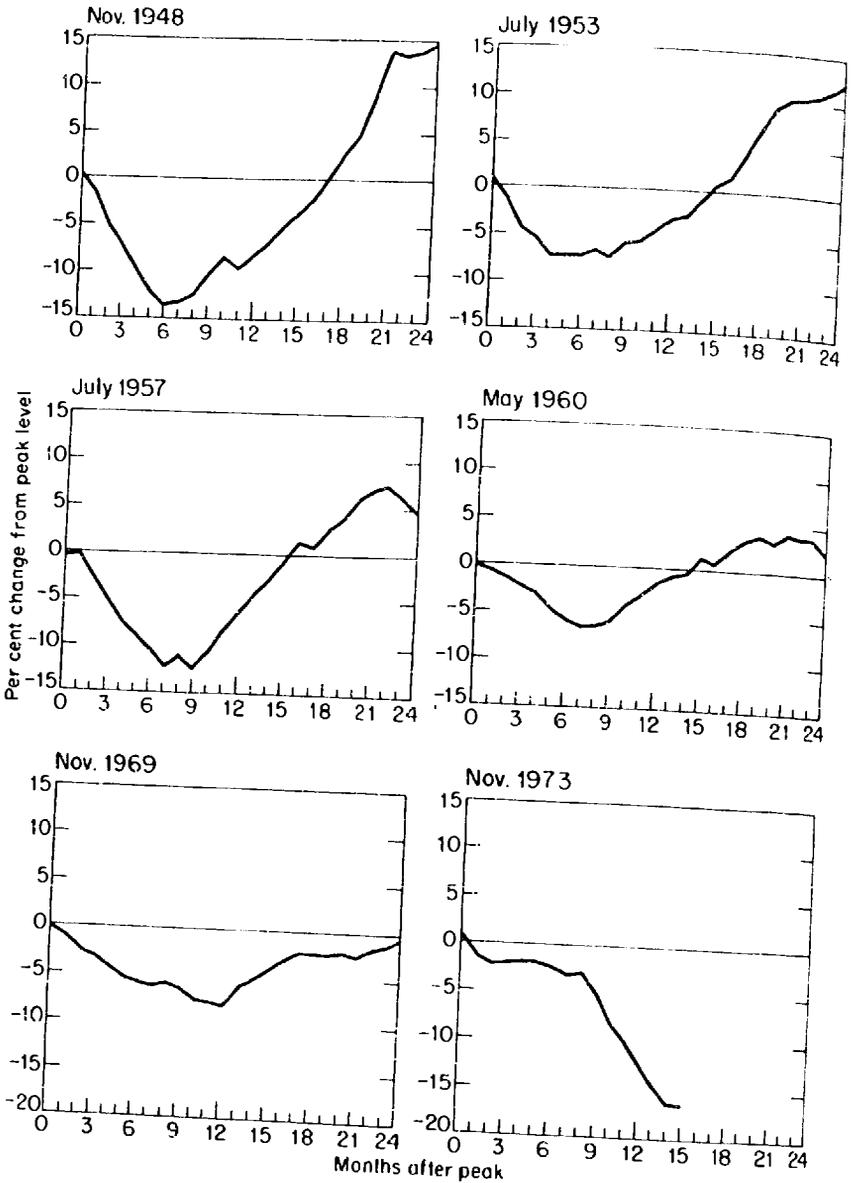
^cUsing ranks shown in parentheses. For six ranks the correlation coefficient should exceed 0.83 to be significant at the 0.05 level.

^dA rank of 1 means that the percentage decline is the smallest among the seven recessions over the corresponding interval; a rank of 7 means that it is the largest. Ranks shown in parentheses omit the 1973-1974 period and hence are comparable with the ranks of ultimate severity (bottom line).

^eUltimate severity is measured by the per cent decline from high to low in a trend-adjusted composite index based on 12 physical volume aggregates (e.g., industrial production, nonfarm employment, real GNP, etc.). These per cent declines are: 1969-1970, -10.2; 1966-1967, -3.0; 1960-1961, -8.5; 1957-1958, -15.5; 1953-1954, -17.2; 1948-49, -17.5.

^fBusiness cycle trough date. In 1953-1954 the trough is in the 13th month, August 1954. The trough of the 1967 "mini-recession" is in the 4th month, May 1967.

CHART 3 Recession Patterns: Index of Leading Indicators, Deflated



gate economic activity, and (c) the absence of any firm indication of an upturn in either group of indicators, it seems reasonable to conclude that the current period is comparable in depth, duration, and diffusion with previous business cycle recessions. The preceding review has indeed revealed some contradictions in these respects between measures ex-

TABLE 6 Chronology of Peaks in Selected Leading Indicators, 1972-1974

Series ^a	Date of Peak	Lead(-) or Lag(+), in Months, at November 1973 Peak
Indicators Measured in Nonmonetary Units		
New building permits, private housing (29)	December 1972	-11
Average workweek, mfg. (1)	February 1973	-9
Net business formation (12)	March 1973	-8
Initial claims, unemployment insurance (inverted) (5)	July 1973	-4
Indicators Measured in Current Dollar Units		
Index of stock prices, S&P 500 (19)	January 1973	-10
Change in consumer instalment debt (113)	March 1973	-8
Industrial materials price index (23)	April 1974	+5
Contracts and orders, plant and equipment (10)	July 1974	+8
New orders, durable goods industries (6)	August 1974	+9
Corporate profits after taxes (16)	Q3 1974 ^b	+9
Change in book value, mfg. and trade inventories (31)	October 1974	+11

NOTE: The indicators are the twelve selected in 1966 in *Indicators of Business Expansions and Contractions*, Geoffrey H. Moore and Julius Shiskin. New Ynrk, National Bureau of Economic Research, 1967, with two exceptions. Initial claims was substituted several years ago for nonagricultural placements because of administrative changes affecting the latter (see *Business Conditions Digest*, September 1969). Also, because of its ambiguity in relation to the monetary-nonmonetary classification used in this table, the ratio of price to unit labor cost in manufacturing is omitted. It reached its highest value to date in November 1974.

^aNumber in parentheses is the series number in *Business Conditions Digest*, U.S. Department of Commerce (monthly).

^bLatest available figure.

pressed in physical units and measures expressed in constant dollars. Nevertheless, no important measure of physical activity has failed to exhibit a decline. Where these declines have been brief, as in the case of employment, they seem likely to be extended into the coming months.

Hence, it is appropriate to reconsider the tentative date for the business cycle peak that was selected early in 1974 and to determine whether that month, i.e., November 1973, or some other is supported by the presently available evidence. To that end we have brought together in Table 7 and Chart 4 eleven comprehensive measures of the physical volume of activity and marked the dates when they reached their peaks. This collection does not, of course, include any measures that are expressed in current dollars,

for the reason that none of the current dollar counterparts of these series, with the exception of retail sales, has at this writing yet reached a peak. It would serve no useful purpose to allow this substantial divergence between nominal and real measures to influence the choice of a peak date in the business cycle. A similar, though less extreme, divergence occurred at the 1969 peak, but rarely at earlier business cycle turns. Surely where there is a substantial divergence between the "real" and the "nominal" measures of aggregate economic activity, few would hesitate to say that the "real" was of more concern and should be the decisive criterion. It was this consideration that led Solomon Fabricant in his analysis of the 1969 peak to opt for November 1969 as the date instead of a later point. Indeed, GNP in current dollars did not decline at all in 1969-1970. If this had been the sole criterion (as some have advocated in the past), no recession would have been designated.

The evidence in Table 7 and Chart 4 points clearly to November 1973 as the appropriate choice for the peak date. Retail sales reached its high well before then, and total final sales (i.e., real GNP less the change in inventories) reached its high in the third quarter; employment continued to rise well into 1974. The bulk of the highs, however, came in 1973's fourth quarter, or in November. November 1973 appears then to meet the criteria used to identify previous business cycle peaks in the National Bureau's chronology, namely the date when aggregate economic activity reached its

TABLE 7 Chronology of Peaks in Eleven Measures of the Physical Volume of Aggregate Economic Activity, 1972-1974

Series ^a	Date of Peak
Retail sales, in constant dollars (59)	March 1973
Final sales in constant dollars (273)	August 1973 ^b
Unemployment rate (43)	October 1973 ^c
GNP in constant dollars (205)	November 1973 ^b
Disposable personal income in constant dollars (225)	November 1973
Index of industrial production (47)	November 1973
Index of five coincident indicators, deflated (825)	November 1973
Index of five physical volume indicators ^d	November 1973
Total civilian employment, household survey (842)	September 1974
Nonfarm employment, payroll survey (41)	October 1974
Manhours in nonfarm establishments (48)	October 1974

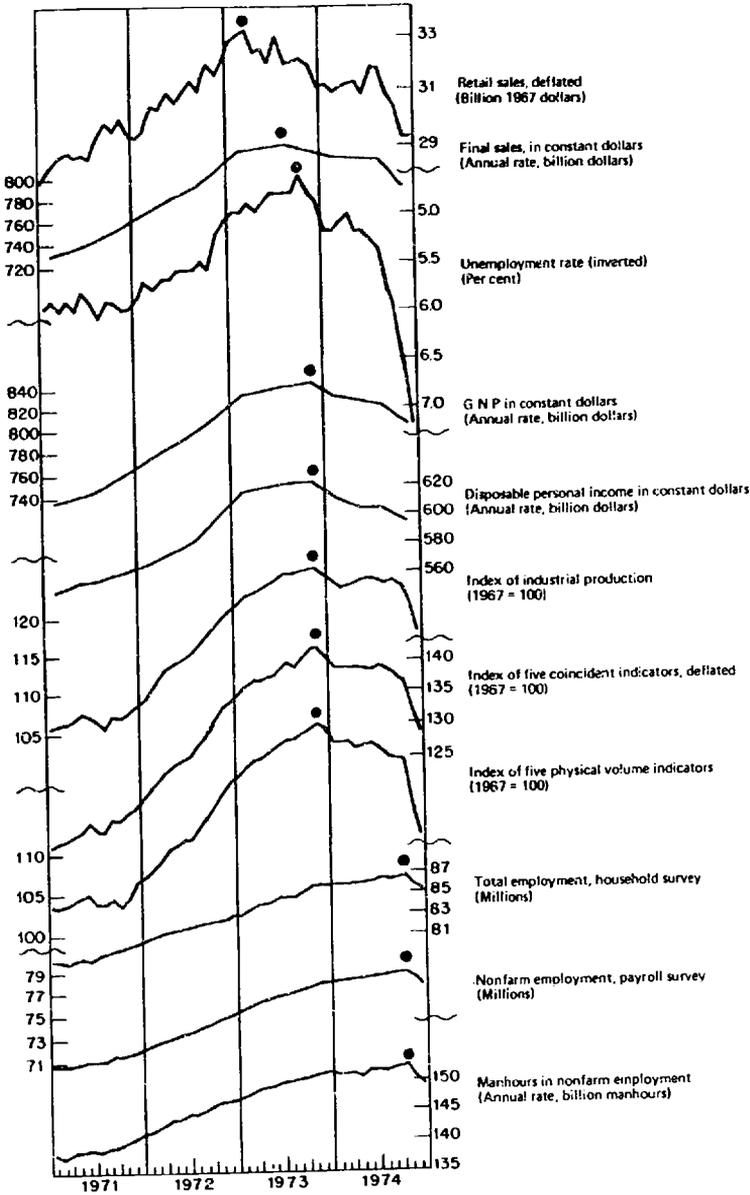
^aNumber in parentheses is the series number in *Business Conditions Digest*. U.S. Department of Commerce (monthly).

^bMid-month of quarter.

^cDate of trough.

^dSee text for explanation of content.

CHART 4 Selected Measures of the Physical Volume of Aggregate Economic Activity, 1971-1974



highest point and began an extended, substantial, and widespread decline. True, for 10 or 11 months after November 1973 the decline was hesitant and not fully evident in all measures of aggregate activity. This prolonged the period during which it was difficult to determine confidently that such a

peak had been reached, but does not alter the case for the November 1973 date now that more evidence is in.

The continued rise in total (or nonfarm) employment was attributable to employment in the service industries. Employment in goods-producing industries (mining, manufacturing, and contract construction) peaked in November 1973 and declined quite steadily thereafter. Employment in the service industries kept on rising until October 1974. An array of the peaks in 30 nonfarm industries shows that half of them reached peaks prior to April 1974, and that 14 of the 15 were goods-producing industries. Lags in service industry employment have been typical of past recessions, but because of continued growth in the service sector they now have a larger effect on total employment.

In this connection a curious development during 1973–1974 needs to be explained. Deflated retail sales peaked in March 1973 and then experienced a bigger decline than in any recession since World War II. Meanwhile, employment in retail establishments continued to rise, reaching its peak only in September 1974. From March 1973 to September 1974 deflated sales dropped nearly 8 per cent, employment rose by 3½ per cent. Part of the explanation, no doubt, is greater use of part-time employees. Yet even total manhours in retail trade was higher in September 1974 than in March 1973 (the peak in manhours was reached in August 1974, when it was half of 1 per cent above the March 1973 level). If the employment and manhours figures are correct, it seems odd that additional labor should be required to handle a much smaller volume of business—which raises the question of whether the drop in the volume of business was as big as present estimates show it to be.

The decline in aggregate activity after November 1973 undoubtedly was influenced by the oil embargo and the cutbacks in some industries, notably automobiles, that this entailed. Other supply shortages in materials, skilled labor, and energy were also important during this period. On the other hand, the slowdown in growth began well before the oil embargo took effect; a major influence was the decline in the physical volume of retail sales that characterized most of 1973. Moreover, the rebound when the oil embargo was lifted in 1974 was weak and failed to carry the level of output, in any of the measures in Chart 4, up to its previous peak. If that had happened, the case for dating the peak of the expansion and beginning of recession later in 1974 would be much stronger. Supply constraints at the peak of a business cycle are, of course, not uncommon, but it is difficult to estimate what would have happened in their absence, and in general the National Bureau has not done so in identifying the peaks of previous cycles.¹¹

[VI] GROWTH RATES AND INFLATION RATES

As noted in Section II, the United States has experienced eight periods of slowdown in economic growth since 1948; a ninth began in 1973. Five of the eight periods encompassed recessions while the other three periods were milder affairs—declines in employment and output were less widespread, total activity continued to grow but at a slower rate, and unemployment scarcely rose at all.¹² The rate of inflation slowed perceptibly or remained very low during each of the eight periods of slower growth, and rose perceptibly, sometimes drastically, at other times. In short, the conditions that produced slower economic growth also reduced the rate of inflation, and the rate of inflation was not reduced otherwise.

Let us see specifically how the record supports this finding. Table 8 shows what happened to output, the unemployment rate, and the rate of inflation—measured by the consumer price index—during the five periods that embraced recessions. These periods each lasted from a year to about a year and a half. Gross national product in real terms, i.e., after allowing for price changes, declined at annual rates ranging from about half of 1 per cent to 2½ per cent. Unemployment rose by 2 to 5 percentage points to levels between 6 to 8 per cent. Each percentage point nowadays represents approximately 900,000 persons, so these are not inconsequential numbers.

The inflation rate declined to much lower levels than when the slowdowns started. In two instances, 1949 and 1954, the rate became negative, that is, the price level dropped for a short time. In another two instances, 1958 and 1961, the inflation rate dropped to zero, that is, the price level became stable. In the last instance, 1970, the rate was cut in half but did not fall below 3 per cent. Hence, recessions have invariably been accompanied by a reduction in the rate of inflation, but have unfortunately also been accompanied by substantial increases in unemployment and a reduction in output.

Table 9 extends the record to the three slowdowns without recession. These periods also lasted from a year to a year and one-half, but real GNP continued to grow, at rates ranging from 2 to 3½ per cent. Despite the slowdown, unemployment rose little or not at all. That is, the rise in employment accompanying the rise in output was just about sufficient to keep up with the growth in the labor force. In all three instances there was some reduction in the rate of inflation, though in 1962–1963, when the rate was already at a low 2 per cent, it did not drop much below that.

Finally, Table 10 looks at the other side of the coin—what happened when the economy grew at a rapid rate. In each of these eight periods real GNP grew at rates of 4½ per cent per year or more: the average for all

TABLE 8 Growth Rates, Unemployment, and Inflation During Periods of Slow Growth and Recession

Periods of Slow Growth and Recession		Duration, in Months (3)	Per Cent Rate of Growth in Real GNP (4)	Unemployment Rate in Per Cent			Inflation Rate in Per Cent (CPI)		
High (1)	Low (2)			Low (5)	High (6)	Change (7)	High (8)	Low (9)	Change (10)
7/48				3			14		
10/49		15	-0.5	3	8	+5		-4	-18
3/53				2			2		
8/54		17	-1.0	2	6	+4		-1	-3
2/57				4			4		
5/58		15	-2.5	4	8	+4		0	-4
2/60				5			2		
2/61		12	-1.5	5	7	+2		0	-2
3/69				3			7		
11/70		20	-0.5	3	6	+3		3	-4

NOTE: For explanation of figures see notes following Table 10.

TABLE 9 Growth Rates, Unemployment, and Inflation During Periods of Slow Growth Without Recession

High (1)	Periods of Slow Growth Without Recession		Dura- tion, in Months (3)	Per Cent Rate of Growth in Real GNP (4)	Unemployment Rate in Per Cent			Inflation Rate in Per Cent (CPI)					
	Low (2)	Low (5)			High (6)	Change (7)	High (8)	Low (9)	Change (10)				
6/51					3				14				
	6/52		12	2.0		4		+1			-1		-15
4/62		3/63	11	3.5	5	6		+1	2		1		-1
6/66		10/67	16	3.0	4	4		0	4		2		-2

NOTE: For explanation of figures see notes following Table 10.

TABLE 10 Growth Rates, Unemployment, and Inflation During Periods of Rapid Growth

Low (1)	High (2)	Dura- tion, in Months (3)	Per Cent Rate of Growth in Real GNP (4)	Unemployment Rate in Per Cent		Inflation Rate in Per Cent (CPI)		Change (10)	
				High (5)	Low (6)	Low (8)	High (9)		
10/49									
6/52	6/51	20	11.5	8	3	-4	14	18	
8/54	3/53	9	8.0	4	3	-1	2	3	
5/58	2/57	30	4.5	6	4	-1	4	5	
2/61	2/60	21	6.5	8	5	0	2	2	
3/63	4/62	14	7.5	7	5	-3	2	2	
10/67	6/66	39	6.0	6	4	-2	1	2	
11/70	3/69	17	4.5	4	3	-1	2	3	
	3/73	28	7.0	6	5	-1	3	5	
							13	10	

Notes to Tables 8, 9, and 10

- Cols. 1 and 2: Growth cycle chronology is from Ilse Mintz, "Dating United States Growth Cycles," *Explorations in Economic Research*, National Bureau of Economic Research, Summer 1974. It is based upon specific cycle peaks and troughs in a trend-adjusted composite index of nine comprehensive measures of the physical volume of aggregate economic activity (e.g., real GNP, industrial production, nonfarm employment, etc.). The March 1973 peak (Table 10) is tentative. The periods of recession encompassed by the slowdowns in Table 8, from peak to trough, are: 11/48-10/49, 7/53-8/54, 7/57-4/48, 5/60-2/61, and 11/69-11/70.
- Col. 3: Interval between dates in cols. 1 and 2.
- Col. 4: Per cent change at seasonally adjusted annual rate from the quarter containing the monthly date in col. 2 to the quarter containing the monthly date in col. 1 to the quarter containing the monthly date in col. 2.
- Cols. 5 and 6: Specific cycle peaks and troughs in the seasonally adjusted unemployment rate associated with the growth cycle turns in cols. 1 and 2. The entries for 1951-1952, 1962-1963, 1966-1967 are exceptions; the increases in the unemployment rate were not sufficiently large or sustained enough to be identified as cyclical.
- Col. 7: Change, in percentage points, between the figures in cols. 5 and 6.
- Cols. 8 and 9: Specific cycle peaks and troughs in the seasonally adjusted rate of change in the consumer price index measured over six month spans dated at end of span. The entries for 1962-1963 are an exception; the decline in the rate was not sufficiently large or sustained enough to be identified as cyclical. The entry for the latest high is tentative (see text).
- Col. 10: Change, in percentage points, between the figures in cols. 8 and 9.

eight periods was 7 per cent. In each period unemployment declined, to levels ranging from 3 to 5 per cent. But inflation always accelerated. The consumer price index was advancing more rapidly when the periods of rapid growth ended than when they began.

Table 10 reveals another disturbing fact: the low rates of inflation with which the periods of rapid growth began have been creeping higher (see col. 8). The trend is unmistakable: from a negative 4 per cent in 1949 to a positive 3 per cent in 1970. Since these low rates came about during the preceding slowdowns in growth, the factors responsible for the association seem to be losing some of their effectiveness on the downside.¹³

We end up, then, with strong evidence for the proposition that slow growth and less inflation go together. But it takes a slower growth rate, or perhaps a longer period, to achieve a low inflation rate now than a decade or two ago. We find also that rates of growth in real GNP in the neighborhood of 2 to 3½ per cent have been accompanied by some reduction in inflation and by relatively little additional unemployment. It must be noted, however, that experience has been limited to slow growth periods that lasted around a year or a year and one-half. Longer intervals might generate more unemployment as well as a larger reduction in inflation, depending partly on what the growth rate was.

It should be noted, also, that the periods when the inflation rate declined did not always begin on precisely the same date as the periods of slower economic growth. Sometimes the decline in the inflation rate began earlier, sometimes later. Table 11 gives the record (col. 5). Since 1969 the lags have been longer—more than a year—than they were earlier. Doubtless this is another manifestation of the greater stickiness in the inflation rate in recent years. Also, it seems to be associated with the longer lags in the unemployment rate.¹⁴

The leads and lags in the inflation rate, when related to the durations of the growth upswings and downswings, tell something about the length of periods when the inflation rate was rising compared with when it was falling. Over the entire period from 1948 to 1974, the inflation rate was in a rising phase during 173 months and in a falling phase during 144 months. Since there were eight periods of rise and eight periods of fall, the average rise lasted 22 months, the average fall 18 months. In short, the inflation rate took less time to come down, as a rule, than it did to go up. This is particularly interesting in view of the fact that over the whole period the average decline in the rate was about as large as the average rise.

The most recent period of slow economic growth began in the early months of 1973. The high was reached around March. During the next year and one-half, i.e., from the first quarter of 1973 to the third quarter of 1974, real GNP rose slowly for three quarters and then declined for the next three, making the average annual rate of change over the period a

TABLE 11 Leads (-) and Lags (+) of Unemployment and the Inflation Rate During Growth Cycles (number of months)

Growth Cycle		Unemployment Rate		Inflation Rate (CPI)	
High (1) ^a	Low (2) ^a	Low (3) ^b	High (4) ^b	High (5) ^b	Low (6) ^b
7/48		-6		-6	
	10/49		0		-8
6/51		-1		-4	
	6/52		-7		+8
3/53		+3		+7	
	8/54		+1		+3
2/57		0		-4	
	5/58		+2		+5
2/60		0		-4	
	2/61		+3		+4
4/62		+3		+1	
	3/63		+2		0
6/66		+5		-2	
	10/67		0		-6
3/69		+2		+13	
	11/70		+12		+21
3/73		+7		+19 ^c	
Median lead or lag		+2	+2	-2	+4

^aSee notes to cols. 1 and 2 following Table 10.

^bInterval in months between the specific cycle turns in the unemployment rate or rate of change in the CPI and the growth cycle turns in cols. 1 and 2. Highs in the unemployment rate are compared with lows in the growth cycle, and vice versa. The rate of change in the CPI is measured over six month spans dated at end of span.

^cAssuming that the 13 per cent annual rate in October 1974 (over preceding six months) represents a cyclical peak.

negative 0.9 per cent. Unemployment rose from 4.6 per cent in October 1973 to 6.5 per cent in November 1974, that is, by nearly 2 percentage points. The rate of inflation, measured in the same way as in our tables, has leveled off. It reached 12.6 per cent in June 1974, 11.9 in July, 12.1 in August, 12.5 in September, 13.2 in October. (These are annual rates, seasonally adjusted, over the preceding six months.)

If the 13 per cent rate in October proves to be the cyclical peak, the 19 month lag in the downturn of the inflation rate after the start of the economic slowdown (March 1973) has been unusually long. But it must be noted that the lag of 21 months at the previous upturn also was unusually long. In other words, the latest upswing in the growth cycle (28 months, November 1970 to March 1973) was of about the same duration as the

latest upswing in the inflation rate (26 months, August 1972 to October 1974), assuming that the peak was reached in October. The upswings in economic growth and in the rate of inflation, according to the record underlying Table 11, have been of roughly the same length and moderately well correlated with one another. Hence an upswing in the rate of inflation that terminated in October 1974 would be in accord with previous experience.

[VII] Recent Developments (to February 1975)

The question with which this study commenced, namely, whether the economic slowdown that began in 1973 would be followed by recession in 1974, has been decided by events. The possibility that November 1973 would mark a business cycle peak was recognized early in 1974, but during the first half of 1974 the issue was in doubt because of the conflicting evidence of different economic indicators, the special circumstances centered around the energy crisis, and the continued boom in some industries such as steel, coupled with contraction in others, notably housing. In the autumn of 1974 the declines became deeper and wider. By the time the preceding account was written, December 1974, sufficient evidence of a recession comparable in magnitude with others in the National Bureau's chronology was in hand. Over the next few months the contraction became still deeper and wider. At the same time indications of a diminishing inflation rate began to accumulate.

These developments brought a new issue to public attention: the relative severity of the current contraction among the entire range of prior recessions, including the Great Depression of 1929-1933.

Table 12 helps to answer this question. Incidentally, it partly avoids the issue of when the recession started (discussed in Section V) because the declines in each indicator are measured from the date when it reached its peak, not from the date of the business cycle peak. It is an abbreviated and updated version of Table 3, including the latest observations on the current contraction, together with those for one of the deepest contractions since World War II (1957-1958) and for two of the deepest prior to World War II (1929-1933 and 1937-1938). Column (1) shows the declines that have occurred to date. Since the declines may continue, the figures may, of course, understate the full magnitudes. Strictly speaking, what the data show is where the current contraction stands *if* it does not become deeper.

For the most part, the entries for 1973-1975 resemble rather closely those for 1957-1958. In duration the declines in real GNP and in industrial production have already exceeded those in 1957-1958, but the decline in

TABLE 12 The 1973-1975 Contraction Compared with Three Preceding Contractions

Indicators	1973- 1975	1929-1933			Initial Decline Corre- sponding to (1)
	Based on Available Figures to Date ^a	1957- 1958 Full Decline	1937- 1938 Full Decline	Full Decline	
	(1)	(2)	(3)	(4)	(5)
Duration (months)					
Business cycle chronology	n.a.	9	13	43	n.a.
GNP, current dollars	^b	6	9	42	12
GNP, constant dollars	12	6	6	36	12
Industrial production	15	14	12	36	15
Nonfarm employment	4	14	11	43	4
Unemployment rate	16	16	11	60 ^c	18 ^e
Depth ^d (per cent)					
GNP, current dollars	^b	-2.6	-16.2	-49.6	-12.3
GNP, constant dollars	-5.0	-3.9	-13.2	-32.6	-6.8
Industrial production	-13.5	-14.3	-32.4	-53.4	-28.3
Nonfarm employment	-2.9	-4.3	-10.8	-31.6	-3.2
Unemployment rate;					
Low	4.3	3.7	11.0	3.2 ^c	3.2 ^c
High	8.2	7.5	20.0	25.2 ^c	12.6 ^e
Increase	3.9	3.8	9.0	22.0	9.4
Diffusion					
Nonfarm industries;					
Maximum percentage					
with declining					
employment ^f	85	88	97	100	100
	Nov. '74	Sept. '57	Dec. '37	June '33	Aug. '30 ^g

NOTE: n.a. indicates not available or not applicable.

^aThe intervals from peak to the lowest point reached to date are: GNP in constant dollars, Q4 73-Q4 74; industrial production, November 1973-February 1975; nonfarm employment, October 1974-February 1975; unemployment rate, October 1973-February 1975.

^bNo decline.

^cBased upon annual averages for 1929 (low) and 1933 (high).

^dPercentage change from the series' peak month or quarter to its trough month or quarter, over the intervals shown above.

^eIn lieu of monthly data an estimate of the approximate unemployment rate 18 months after the 1929 low (3.2 per cent) was obtained by averaging the annual figures for 1930 and 1931 (8.9 and 16.3 respectively).

^fFor 1957-1958 and 1973-1975, based on changes in employment over six-month spans in 30 nonfarm industries, centered on the fourth month of the span. Hence the interval covered runs from three months before to three months after the month shown on the bottom line. For 1929-1933 and 1937-1938, based on cyclical changes in employment in 41 industries.

^gAugust 1930 is the date selected to correspond with November 1974 (col. 1), since both are 12 months after the business cycle peak (August 1929 and November 1973, respectively).

employment has been much smaller. The percentage decline in real GNP is substantially larger than in 1957-1958, but the drop in industrial production and the rise in unemployment is about the same and the decline in employment smaller. So far, the 1973-1975 decline in employment has been about as widely diffused as in 1957-1958.

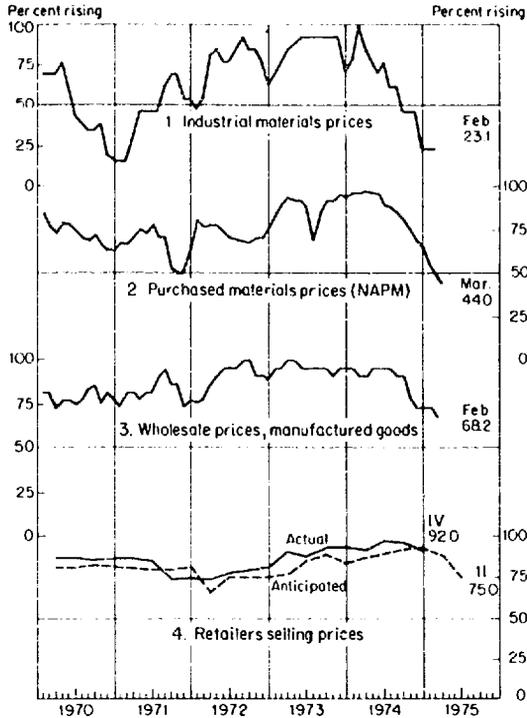
The 1937-1938 contraction was similar in duration to that of 1957-1958, but far exceeded the latter in depth and diffusion, and hence far exceeded the current decline to date. Finally, the Great Depression of 1929-1933 stands in a class by itself, as the figures in column (4) show.

Since the 1929-1933 contraction was so much longer than the others, the question can of course be raised, how did it appear after the first year or so? The entries in column (5), based on changes over intervals corresponding to those in column (1), show that in every instance the initial declines in the Great Depression were larger and more widespread than those in the current period. In two instances, real GNP and nonfarm employment, the differences are not great, but in the rest they are substantial.

One of the most striking differences between the situation then and now is the fact that in 1929 the declines in current dollar GNP exceeded those in constant dollar GNP, because the price level declined together with the physical volume of output. Nevertheless, the possibility of at least a reduction in the rate of inflation during 1975 has come to be widely recognized. One of the first concrete evidences of this development was the decline, beginning around April 1974, in the prices of many industrial materials—such as rubber, copper scrap, lumber, hides, and wool—that are especially sensitive to shifts in demand-supply pressures. This afforded a dramatic instance of the historical tendency noted in Section VI for rates of price inflation to recede at least as fast as they accelerate. It took more than two years for the rate of advance in the Bureau of Labor Statistics index of spot market prices of industrial materials to build up from zero in late 1971 to the 50 to 60 per cent annual rate that it reached in the spring of 1974. But the rate dropped to zero over the next few months and then became negative. In February 1975 the index was 24 per cent below its peak level in April 1974. The more comprehensive wholesale price index of crude materials excluding foods and feeds followed much the same path.

Another piece of evidence that augured a reduction in the rate of inflation was the softness in most direct measures of demand-supply pressures, including many of the "leading indicators" discussed in Section IV. The physical volume of new orders, the change in unfilled orders, vendor performance (per cent of companies reporting slower deliveries), the average workweek and average overtime hours worked, housing starts, and floor space of commercial and industrial building contracts are examples of physical measures of this type, and they all receded from previous

CHART 5 Diffusion Indexes of Prices, 1970-1975



NOTE: The spans over which price changes are measured, the number of items covered, and the sources are: (1) 9 months, 13 materials, Bureau of Labor Statistics; (2) 1 month, approximately 250 respondent members of the National Association of Purchasing Management; (3) 6 months, 22 indexes, Bureau of Labor Statistics; (4) 4 quarters, approximately 250 respondents, Dun & Bradstreet, Inc., Survey of Businessmen's Expectations. The per cent rising is plotted in the final month or quarter of the span.

peak levels during 1974, with especially rapid declines in the second half of the year.¹⁵

One of the concomitants of a softening of demand-supply pressures is that increases in prices become less widespread and reductions more widespread. Evidence of this type of development, measured in terms of diffusion indexes, began to show up during 1974 (see Chart 5).¹⁶ The first to show it was the diffusion index of spot market prices of industrial materials, which reached its high (100 per cent rising) in February 1974, and fell steadily to 23 per cent rising in February 1975. At about the same time the diffusion index based on reports of purchased materials prices by members of the National Association of Purchasing Management declined from a high of 97 per cent in March 1974 to 50 per cent in February 1975. The last reduction of comparable magnitude was in 1970. In the autumn of 1974 reductions of similar size began to appear in the diffusion index for manufactured goods prices at wholesale. The Dun and Bradstreet indexes

for manufacturers', wholesalers', and retailers' prices, both actual and anticipated, also started to drop. Inflation was becoming less general.

Finally, there is some evidence from the comprehensive price indexes themselves. The measure of the rate of inflation used in Section VI, namely, the percentage change in the consumer price index over the preceding six months, seasonally adjusted at annual rate, reached its high to date in October 1974, at 13.2 per cent. The succeeding figures are: November 1974, 12.7; December 1974, 12.2; January 1975, 12.1; and February 1975, 10.5. The month to month changes have declined more sharply, as they usually do, from a high of 1.3 per cent per month in August and September to 0.9 in October and November, 0.7 in December, 0.6 in January, and 0.6 in February.¹⁷ In addition, the rate of increase in the wholesale price index for industrial commodities declined sharply after August 1974. The high point in the six-month change at an annual rate was 36.9 per cent in August; it has declined continuously since then to 8.4 per cent in February 1975, a decline that was accomplished in about one-third the time it took to rise from the corresponding level in early 1973. If this trend continues, the historical association between economic slowdowns, recessions, and the rate of inflation will have repeated itself once again.

NOTES

1. See *Economic Indicator Analysis During 1969-1972, Nations and Households in Economic Growth*, Paul A. David and Melvin Reder, eds. (New York: Academic Press, Inc., 1974); also, *Measuring Recessions, Business Cycle Indicators*, Geoffrey H. Moore, ed. (New York: NBER, 1961).
2. The NBER chronology of business cycle peaks and troughs has recently been intensively reexamined and revised in the study of indicators undertaken by Victor Zarnowitz and Charlotte Boschan for the Bureau of Economic Analysis, U.S. Department of Commerce. The revised dates have not been used in this report because they were not available at the time the work began, but it is unlikely that they would make any appreciable difference in the results. Only four of the ten peak and trough dates, 1948-1970, are changed, one trough by three months (August to May 1954) and three peaks by one month each (July to August 1957, May to April 1960, November to December 1969).
3. If the peak in the index were used as the starting point, the declines in earlier periods might or might not be sharper than those shown in the table. They would start from a higher level, but would reach less far into the recession period. In fact, computations covering the first ten months of decline after the index's own peak place the current decline in substantially the same position as in the table.
4. One of the useful properties of this index is that it is so constructed that its average movement is 1 per cent per month. This is achieved by standardizing the rates of change in each of the five components in such a way as to produce an index with an average rate of change of 1 per cent. Because of this property it is easy to see whether a particular change in the index is above or below average.

5. The reason for this is that the level of the unemployment rate is governed in part by factors unrelated to the state of prosperity. In recent years, the rate has been higher, in both prosperity and recession, because of the large increase in the proportion of female and younger workers, who have higher unemployment rates than adult men whether the labor market is tight or easy. The change in the rate over short periods is less affected by such shifts in labor force composition. See *How Full is Full Employment?* by Geoffrey H. Moore, American Enterprise Institute for Public Policy Research, Domestic Affairs Study No. 14, July 1973, pp. 27-28.
6. For further description and analysis see Walter W. Ebanks, "A New Index of the Physical Volume of Economic Activity" *Business Economics*, May 1975.
7. The longer historical perspective of Table 3 can, of course, be reproduced on the same plan as in Table 2, i.e., in terms of declines during the first 12 months in each recession. Even on this basis the current declines are small relative to those in 1921, 1929, or 1937. For example, the percentage declines in industrial production during the first 12 months following business cycle peak dates are: Jan. 1920, -28.0; May 1923, -11.9; Oct. 1926, -5.2; Aug. 1929, -22.9; May 1937, -32.5; Feb. 1945, -35.0; Nov. 1948, -6.2; July 1953, -7.8; July 1957, -8.0; May 1960, -1.6; Nov. 1969, -7.1; Nov. 1973, -3.9. In the same order, starting with 1929 because figures are not available earlier, the percentage declines in nonfarm employment are: -9.6, -9.7, -6.3, -4.2, -3.3, -3.9, -1.3, -1.3, +0.7.
8. For example, consideration might be given to development of a survey that would obtain a representative collection of realized prices from the same enterprises that supply figures on aggregate sales, orders, and inventories. Another possibility would be to collect, and utilize in a set of alternative estimates, data on sales, orders, and inventories in physical units. A statistical monitoring service that would flag problems affecting the current interpretation of economic data might also serve a useful purpose.
9. Ilse Mintz, *Dating Post-war Business Cycles* (New York: NBER, 1966) and "Dating United States Growth Cycles," *Explorations in Economic Research*, Summer 1974; Philip A. Klein, "Postwar Growth Cycles in the United Kingdom," NBER (in preparation).
10. "The 'Recession' of 1969-170," in *The Business Cycle Today*, Victor Zarnowitz, ed. (New York: NBER, 1972), p. 124.
11. The most recent case of an event creating a supply constraint at a business cycle peak was in 1959-1960, when the steel strike curtailed output in the second half of 1959. Anticipation of the strike stimulated output before it occurred, and compensating for unanticipated losses in output stimulated output afterwards. Where the peak would have come if the strike had not taken place is difficult to say, but the poststrike surge carried the economy to a new high, and the peak was determined to be in May 1960.
12. For a careful analysis of these periods, which I draw upon in what follows, see Ilse Mintz, "Dating United States Growth Cycles."
13. A report by Philip Cagan documenting this tendency in terms of wholesale prices, entitled "Changes in the Recession Behavior of Wholesale Prices in the 1920's and Post-World War II" appeared in *Explorations in Economic Research*, Winter 1975.
14. The simple and partial correlation coefficients between the lags in the unemployment rate (u), the lags in the CPI rate (c), and time (t), for the 17 observations in Table 11 are as follows:

$$\begin{array}{ll}
 r_{uz} = +.74 & r_{ut,c} = +.60 \\
 r_{ct} = +.57 & r_{ct,u} = +.24 \\
 r_{uc} = +.60 & r_{uc,t} = +.32
 \end{array}$$

At the .05 level of significance the simple correlation coefficient should exceed .48, and the partial coefficient should exceed .50. The results suggest that there is some linkage

between the lags in the inflation rate and the unemployment rate, that there is somewhat stronger evidence of a trend towards longer lags in the unemployment rate than in the inflation rate, and that the unemployment rate trend accounts in part for the inflation rate trend.

15. For an analysis of the use of leading indicators in relation to the rate of inflation, see *Perspectives on Inflation*, The Conference Board in Canada, 1974, pp. 25-37.
16. A diffusion index of prices is simply the percentage of prices that are rising plus half the percentage that remain unchanged. A useful collection of such indexes, which is drawn upon in Chart 5, is contained in the Bureau of Labor Statistics' *Chartbook on Prices, Wages and Productivity*, Charts 10 and 11, monthly. See, also, *Business Conditions Digest*, Department of Commerce, Charts C-2 and E-3, monthly.
17. The month to month changes are far more erratic than the six-month changes, which means they are more subject to reversals. On the other hand, they tend to reach cyclical highs and lows earlier than the six-month changes, as they apparently did in this instance. Changes over twelve-month spans are even smoother than the six-month changes, but the turns are still later. For example, the high to date in the twelve-month change was reached in December 1974, at 12.2 per cent. It was 11.7 in January 1975 and 11.1 in February. The selection of the six-month change as the rate to focus upon is a compromise between the desire for prompt identification of a cyclical turn and certainty that it is one.