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FORECASTING RECESSIONS UNDER THE GRAMM-RUDMAN-HOLLINGS LAW

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ABSTRACT

The targeted deficit reductions of the Gramm-Rudman-Hollings (GRH) law are to be temporarily suspended in case of an official determination that real economic growth either (a) has been less than one percent in the two most recent reported quarters, or (b) is projected to be less than zero in any two consecutive quarters out the next six. This amounts to a particular definition of recession. But business cycles are best identified by the consensus of movements in the principal economic aggregates. Not all recessions are associated with real GNP declining or growing less than 1% for two successive quarters. Also, GNP estimates are subject to long sequences of revisions that are often large.

We show that, for these reasons, conditioning a suspension of deficit cuts upon specific changes in preliminary data for real GNP involves very long lags in recognizing recessions. The recessions would be largely over before they were identified. We also show that forecasts of real GNP, based on the consensus among groups of professional forecasters, can reduce these lags considerably. This is so despite the fact that early and accurate predictions of business cycle peaks are rare, and false warnings occur.

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1. Introduction

The Gramm-Rudman-Hollings (GRH) law passed by the Congress in December 1985 establishes a process whereby the Federal budget deficits are to be gradually phased out by the fiscal year (FY) 1991. A series of targeted ceilings on the unified budget deficit is instituted, beginning with $172 billion for FY 1986 and $144 billion for FY 1987 and proceeding by decrements of $36 billion per year to zero in FY 1991. The planned reductions are to be achieved by spending and tax measures agreed upon by the legislative and executive branches of the U.S. government. However, if an agreement is not reached, the target for any FY is to be achieved through an automatic across-the-board spending cut in all eligible defense and nondefense categories. Early in 1986 a lower court ruled that the sequestering provision of GRH is unconstitutional; this ruling was confirmed by the Supreme Court on July 7, 1986. This does not pertain to the issues discussed in this paper.

Section 254 of the GRH law provides for "Special Procedures in the Event of a Recession." It states that the Congressional Budget Office (CBO) Director shall notify the Congress at any time (a) if the CBO or the Office of Management and Budget (OMB) "has determined that real economic growth is projected or estimated to be less than zero with respect to each of any two consecutive quarters" within a period of six successive quarters starting with the one preceding such notification, or (b) "if the Department of Commerce preliminary report of actual real economic growth (or any subsequent revision thereof) indicates that the rate of real economic growth for each of the most recent reported quarter and the immediately preceding quarter is less than one percent."

Upon receiving the CBO Director's notification, both Houses commit themselves to procedures designed to suspend several GRH provisions. These concern the maximum deficits for the current and the next fiscal year, and the corresponding spending and revenue levels.

In short, the targeted deficit reductions are to be suspended when a recession is either (a) forecast by CBO or OMB or both, or (b) reported as being under way by the Bureau of Economic Analysis (BEA) in the U.S. Department of Commerce. This is important since the spending cuts and/or tax increases needed to produce the deficit reductions might seriously aggravate the recession. And the probability that a recession will occur at some time during the long period between the present and the end of FY 1991 must certainly be viewed as rather high.

This paper addresses three questions in the following order:

(1) How accurately and promptly has the Commerce report that real GNP growth fell below 1% in two consecutive quarters identified previous business recessions? This is an attempt to trace the implications of provision (b) above with the aid of historical data.

(2) What can reasonably be expected from the past record of economic forecasters with respect to their ability to predict a recession defined as two consecutive quarters of decline in real GNP? This is a similar attempt to trace the implications of provision (a) above.

(3) How do the foregoing results compare with alternative signals of recession based upon leading indicators and employment data?

2. Defining and Recognizing Recessions

The conditions under which the deficit reductions otherwise mandated under GRH would be suspended imply two alternative definitions of a business recession. One of these requires at least two consecutive quarters during which "real economic growth" stays below zero: this refers to the CBO or OMB forecasts. The other, used with reference to the BEA reports, is a sequence of at least two quarters with growth rates of less than one percent. It is clear from the language employed in some earlier sections of the law that the criterion in both cases is growth of GNP in constant dollars.[1] The difference between the two definitions suggests that the legislators may have thought that forecasts of negative growth were more likely to identify actual recessions than forecasts of very low but still positive growth.

We abstract for the time being from forecasting and address the problems of defining and recognizing recessions from data limited to the quarterly series on output of the U.S. economy (GNP in constant dollars). One difficulty here is that some generally recognized recessions have not been marked by two consecutive declines in this series. Thus in 1960 total U.S. output fell in the second and fourth quarters but not in the third quarter, and in 1980 it fell in the second quarter only (Table 1). In these cases, then, the criterion of two successive declines in real GNP would have produced no recognition of a recession at all. However, in both these instances the criterion of two quarters of less than one percent growth was met, which may account for the alternative definition in the GRH. Nevertheless, any individual indicator series, even one as comprehensive and important as GNP, can measure only some of the aspects of aggregate economic activity. Also, all such series contain measurement errors that are in part independent and

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[1]Both the House Amendment and the Senate Amendment in section VI ("Economic Conditions") of GRH contain similar provisions regarding the predicted and actual real growth rates. The House version also referred to the event that the average rate of unemployment for two consecutive months is one percent above the same two months for the previous year, but this particular trigger was dropped in the Conference Agreement (see Congressional Record-House, December 10, 1985, p. H-11710).

revealed by data revisions. For these reasons, business cycles are better identified from the consensus of key macroeconomic indicators for employment, production, real income and real sales than from any single one of these series. The National Bureau of Economic Research (NBER) has always relied on this principle in developing its much tested and widely accepted chronology of recessions and recoveries. The peak and trough dates in our tables are those determined by NBER.

Table 1 compares the recessions as dated by NBER (columns 1-3) with periods of two or more consecutive quarters during which the economy grew less than one percent (SAAR). Ten such sequences of low or negative growth rates occurred in the presently available historical series of real GNP for 1948-82 (part A, column 4), whereas the number of concurrent business cycle contractions is eight. Thus the GRH definition that counts low rises along with declines in total output yields two additional "recessions." One of these relates to a mild two-quarter slowdown that preceded the downturn of January 1980 by about a year, a serious discrepancy. The other merely involves a single-quarter interruption of the 1981-82 decline in real GNP. When the two episodes are excluded, the peak signal dates from the historical series (mid-months of quarters preceding the low-growth periods, see column 5) are found to be on the average coincident with the business cycle peaks. The range of these timing comparisons is from a lead of 4 months to a lag of 6 months, the standard deviation is 3 months (column 7).

For a time, the earliest estimates for GNP were published in the last month of the quarter as the "flash report," based on very incomplete data and often subject to large revisions. Now the first report is published in the first month of the following quarter, and in the earlier years the publication lags were longer. In Table 1, the effective data release dates are taken to fall in the month following the second quarter with real growth of less than one percent (column 6). The recognition lags, measured from the reference peak dates to these data release dates, are listed in the last column of the table; excepting the two false signals noted before, their range is +4 to +14, with a mean of +8 and standard deviation of 3 months. For six of the seven recessions, the recognition lag was at least 6 months. These results are about what one would expect, given the requirement of at least two successive quarters of very low or negative growth, the roughly coincident cyclical timing of real GNP, and the informational delays involved.

Of course, the data used in Table 1, part A were not available to anyone who would have tried to recognize recessions at the time they occurred. Part B of the table is based on preliminary data that would have been available to contemporary observers. Quarterly estimates of real GNP began to be published regularly in 1959 and so for 1948-58 only the rates of change in current-dollar GNP are used. Price changes were moderate in this period (except in 1950), and indeed the results are identical with those based on the present data for real GNP (compare the first four lines, columns 5-8, in parts A and B of the table). Preliminary data based on incomplete information often have large extrapolative components and they share with forecasts the tendency to underestimate actual change (Cole 1969; Zarnowitz 1982), but here the early estimates produce results that are very close to those obtained with the last revised estimates. The mean signal and recognition lags in part B are 0 and +8, respectively, the same as in part A, while the standard deviations are somewhat smaller.

To sum up, mere monitoring of the data on real GNP growth cannot produce prompt recognition of recessions. The typical range of the delays involved in the process is about 6-9 months, by which time the recession itself may nearly be over. (Business cycle contractions since 1948 ranged from 6 to 16 months and averaged 11 months.) The length of the recognition lags is very little affected by whether a recession is defined as two consecutive quarterly declines in real GNP or as two quarters of growth below one percent. Also, the conclusion that the lags tend to be long relative to the length of recessions holds regardless of whether preliminary or revised data are used.

The events that must occur for the deficit cuts to be suspended are exactly stipulated in GRH, but there appears to be nothing specific in the law about the mechanism for ending a decreed suspension. Presumably, the deficit reductions will resume when the legislators recognize that the conditions which triggered the suspension no longer exist, but how promptly would this happen in response to what signals? Suppose that the recognition that a recession is over required two consecutive quarters of positive growth in real GNP to follow each of the sequences listed in Table 1, column 4. Then substantial delays in recognizing a recovery would be likely; for the eight business cycle troughs of 1949-82 such lags would have ranged from 5 to 10 months and averaged 8 months, using the present data. A better rule to follow would be to assume that the recovery is on as soon as it is known that output increased at an annual rate of more than one percent for a single quarter after a period of a recognized recession. This criterion would have come fairly close to most of the trough dates of recessions, reducing the average recognition lag to 3 months. However, some false signals of troughs would have resulted, as illustrated by the rise of real GNP in II82 (see Table 1, notes h and l.)

3. Forecasting Recessions

The meaning of the long recognition lags listed in Table 1 is that any signals from the actual data on real GNP growth would have been much too tardy for the purposes envisaged in the recession-related provisions of GRH. If Congress had to rely on such signals, it would be likely to suspend the deficit cuts at best only late in a recession. By then the fiscal tightness required by GRH would have already done its harm in contributing to the business contraction. The suspension might still help in hastening the end of the decline, but it could also be sufficiently mistimed to overstimulate the economy during the following recovery and expansion.

Clearly, it is only timely and accurate forecasts of an approaching recession that could provide the right warnings when needed. Studies have repeatedly shown that combining predictions from diverse sources and methods often results in significant gains in accuracy. That is, the consensus forecasts from surveys are typically more accurate than most of the individual forecasters polled (Zarnowitz 1984), when accuracy is measured over a considerable period of time. The record of such group averages in predicting the major macroeconomic variables is often as good as or better than that of the principal econometric forecasting models (McNees 1973, 1979). These research findings are based on the median forecasts from the surveys conducted quarterly since 1968 by the American Statistical Association (ASA) and NBER. For this paper we shall use the consensus forecasts of real GNP growth both from the ASA-NBER quarterly survey and from the well-known Blue Chip Economic Indicators monthly survey. The results should compare reasonably well with what might be expected from the CBO and OMB forecasts that are required under the GRH law.

Fifteen of the quarterly ASA-NBER surveys since 1968 can be linked to recessions as defined by GRH (Table 2). Six of these predicted that real GNP would turn down and fall for at least two consecutive quarters during the year ahead, while nine predicted that a decline shown by the preliminary data for one or more previous quarters would continue for at least one more quarter. Estimates of actual change are listed for two quarters (Q_{-1}, Q_0) preceding the quarter Q_1 in which the survey was taken (columns 4-6). The median survey forecasts of real growth in the five successive quarters covered by each survey (Q_1-Q_5) are shown next (columns 7-11). Signal leads or lags (column 14) measure the intervals between the peak dates implied by the configurations of the estimates and forecasts (column 12) and the business cycle peak dates determined by NBER (column 1). Recognition leads or lags (column 15) measure the intervals between the survey release dates (column 13) and the business cycle peak dates.[2]

The first signals of peaks that did subsequently occur and the corresponding recognition lags are included in the averages shown on the bottom line. The other entries in the last two columns are put in parentheses and excluded from the averages. Most of these are secondary signals that merely confirm the initial ones, but in 1979 a recession was repeatedly predicted that did not happen in that year and these signal and recognition leads, marked F, are also excluded. It is important to note, however, that these false warnings could not be readily recognized as such at the time and might have been seriously misleading, although a brief recession did occur in 1980.

The forecasters as a group did not perform well in predicting the 1969-70 recession, according to the present criteria. In November 1969 their average forecast for IV69 was -1.2% which correctly captured the timing of the peak,

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[2]The survey questionnaire is mailed by the ASA in the middle month of each quarter to a list of persons who are professionally engaged in forecasting the course of the economy. The replies are sent to and examined by the NBER, and regular reports on the results are released in the third month.

but the predicted decline was to last one quarter only. In February 1970 no further downward movement was anticipated. The May 1970 survey is the first to qualify under the criterion of two consecutive quarterly declines. Hence the recognition lag was 6 months, whereas the corresponding recognition lag in Table 1 was 4 months.

The survey taken in February 1974 predicted negative growth rates for both I74 and II74. Hence the forecast yields a lag of 4 months at the business cycle peak of November 1973, much less than the recognition lag of 8 months based on preliminary actual data (Table 1, part B). Moreover, according to the presently available revised data the recognition lag was 14 months (Table 1, part A).

This brings up an important point. The GNP data are subject to long series of revisions which are frequently large relative to the quarterly changes. Compared with the "final" figures, the preliminary estimates of growth in the nation's output are sometimes about as much in error as the earlier forecasts of growth. In large part, the measurement errors involved are occasioned by major benchmark revisions related to censuses taken at intervals of several years or by changes in the base year of the constant price estimates. Neither the forecasters nor the data compilers themselves can be reasonably expected to predict such revisions. Since the final data may not be known for years, they can hardly be of much help on a current basis to economic analysts and forecasters.

During 1979, when economic activity ceased to grow after four years of expansion, many economists repeatedly predicted a downturn too soon. Thus the surveys of February, May, and August 1979 produced median forecasts of declines that did not happen (F). But the same episode also produced the earliest correct peak forecasts in the November 1979 survey as the long-anticipated downturn materialized at the beginning of 1980. The signal and recognition leads of 5 and 1 months, respectively, contrast with lags of 1 and 9 months in Table 1.[3]

Finally, the downturn of July 1981 was not anticipated earlier that year, although in May the forecasters as a group predicted zero growth for II81 and in August predicted zero growth for III81. The first forecast of at least two successive quarters of decline was issued in November and then showed negative growth for three quarters, starting with II81. The signal and recognition lags for this recession are -5 and +5 months, respectively, which is still much better than the corresponding lags of 1 and 9 months recorded in Table 1.

The overall averages in Table 2 are a signal lead of 4 months and a recognition lag of 3 months. The corresponding measures yielded by the actual data for the same period are mean lags of 1 and 9 months in Table 1A and of 2 and 8 months in Table 1B. This suggests a significant gain from the forecasts, which however is qualified by the false signals that on balance weigh much more heavily against the forecasts than against the data.

The Blue Chip surveys, initiated in 1978, cover only the recessions of 1980 and 1981-1982, but they have the advantage of being monthly and hence very up-to-date. The 27 surveys that produced average predictions of recessions as defined by GRH are listed in Table 3, which follows the same rules and has the same format as Table 2.

Although their sources as well as frequency are quite different, the two sets of forecasts show similar patterns. In Table 3 again there is a sequence

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[3]Recall that real GNP declined only in one quarter (II80) during the short recession of Jan.-July 1980 so that the "less than 1% growth" rule must be invoked in Table 1 to identify this particular peak. But the same rule, when applied to the present revised data, yields in this case a lead of 6 months! (Table 1, part A). This is because these data show zero growth in I79 and a slight decline in II79.

of false signals of peaks in 1979 that ends in November when both surveys gave the earliest correct warning of the January 1980 downturn (the recognition lead is here slightly longer for Blue Chips because of faster processing). Blue Chips then produced a somewhat longer sequence of timely signals. Both surveys erred in August-September 1980 in forecasting that the recession would continue in the second half of the year. Blue Chips issued a correct prediction of the July 1981 peak in August, i.e., with a lag of one month only, whereas ASA-NBER did so in December, with a recognition lag of 5 months. For the two recessions of the early 1980s, the averages of the earliest signals are -5 and 0 for Blue Chips and -5 and +2 for ASA-NBER.

Finally, let us note that neither group predicted any two-quarter declines in real GNP since the end of the last recession in November 1982. This may be counted as a significant plus for the forecasters since the slowdown from mid-1984 through 1985 was accompanied by severe difficulties in several important economic sectors, much uncertainty, and large revisions of the GNP data.

4. Alternative Approaches

Table 4 compares the above results with some alternatives. Signals of recession from reported data on real GNP growth under the GRH definition are very tardy (column 2). The evidence from surveys of forecasters looks reasonably good, suggesting that some recessions can be predicted at about the time of their occurrence or with short lags (columns 3 and 4). But this result must be tempered by the recognition that (1) the time series of forecasts cover few recessions and so are not very informative on this point; (2) the variation of the leads and lags obtained is relatively large (see the reported standard deviations); and (3) the forecasters produced some potentially misleading false signals.

It is therefore of interest to consider also some other possible approaches to signaling recessions, which could provide inputs into the forecasts by the agencies involved in the GRH process. A few years ago, the authors developed a system of recession and recovery signals based upon smoothed rates of change in the government indexes of leading and coincident indicators (Zarnowitz and Moore 1982; reprinted with an update in Moore 1983, chapter 4). This system produces sequentially, on a current monthly basis, early warnings and confirmations of business cycle turning points. The first signal of a peak (P1) is observed when the smoothed rate of growth in the leading index falls below 2.3%, while the corresponding rate for the coincident index is nonnegative ($L < 2.3$; $C \geq 0$); the second (P2) is defined by $L < -1.0$, $C < 2.3$; and the third and last (P3) by $L < 0$, $C < -1.0$. The P1 criterion results in very early signals which, however, turn out fairly often to be false (F); P2 substantially reduces both the lead times and the frequency of the F's; and P3 is associated with short or intermediate lags but seems to eliminate the F's altogether. Table 4, column 5, lists the lags for P3 and shows them to average 2 or 3 months. A particular advantage of this approach is the low variability of the lags over time.

Each of the post-World War II business cycle downturns in the United States was accompanied by increases in the overall unemployment rate of at least 0.5% averaged over spans of six months. An index combining six selected series published by the Bureau of Labor Statistics relating to marginal employment adjustments (e.g., average work week, layoffs, initial unemployment claims) is compiled monthly by the Columbia Center for International Business Cycle Research (CIBCR). Smoothed rates of growth in this index produce relatively accurate semiannual (January and July) forecasts of changes in the average rate of unemployment over the ensuing six-month periods (Moore 1985). A by-product of these CIBCR projections is a set of signals of recessions reproduced in Table 4, column 6. Five of these are timely (-1 to +3 months) and three are lags of 6-7 months; two forecasts, dated 7/56 and 1/67 gave false peak warnings. The averages are lags of 3-4 months. The unemployment criterion of recession has two advantages: the unemployment rate is not subject to revision and it is a concept widely understood by the public.

5. Summary

Our results lead to the following conclusions:

1. There are serious problems with the definition of recessions adopted in the Gramm-Rudman-Hollings law. Business cycles are best identified by the consensus of movements in the principal economic aggregates, as is done in the widely used chronology maintained by the National Bureau of Economic Research. Not all recessions are associated with, or well identified by, real GNP either declining or growing less than 1% (SAAR) for two consecutive quarters. GNP estimates are subject to long sequences of revisions that are often large, which aggravates the situation.

2. The record of preliminary estimates of real GNP published by the Department of Commerce shows that most recessions would have been at least half over by the time they would be recognized by the criterion of slow growth specified in the Gramm Rudman law. Hence the suspension of deficit cuts according to this criterion may come too late to play an effective anti-recession role.

3. Tests of the alternative criterion based upon forecasts of two successive declines in real GNP, using records of consensus forecasts by economists, yield more satisfactory results. Most recessions would have been recog-

nized just a few months after they began. Occasionally, however, premature or false warnings have occurred.

4. Leading indicators of aggregate economic activity can also assist the makers and users of forecasts in reducing the length and variability of the lags in recognizing recessions. Indicators that are specifically designed to anticipate changes in employment and unemployment may provide additional services of this type.

5. Although no criteria for recognizing <u>recoveries</u> from recessions are specified in the Gramm-Rudman law, tests of two possible procedures show that most recoveries could be identified shortly after they began.

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Table 1

Lags in Recognizing Recessions Under the GRH Criterion for Real GNP Growth (Two Consecutive Quarters Below One Percent)

A. <u>Based on the Present Historical Data</u>[a]

Business Cycle Recession Peak (1)	Business Cycle Recession Trough (2)	Recession Duration (months) (3)	Growth in Real GNP (1982 Dollars) from Preceding Quarter (SAAR)[b] (4)	Peak Signal Date[c] (5)	Data Release Date[d] (6)	Signal Lead (-) or Lag (+), in months[e] (7)	Recognition Lead (-) or Lag (+), in months[f] (8)
11/48	10/49	11	I49 II49 -4.6 -2.3	11/48	7/49	0	+8
7/53	5/54	10	II53 IV53 I54 II54 -1.9 -3.2 -5.4 -1.6	5/53	1/54	-2	+6
8/57	4/58	8	IV57 I58 -6.1 -7.9	8/57	4/58	0	+8
4/60	2/61	10	II60 III60 IV60 -1.1 0.4 -3.4	2/60	10/60	-2	+6
12/69	11/70	11	IV69 I70 II70 -1.6 -2.4 -0.3	8/69	4/70	-4	+4
11/73	3/75	16	III74 IV74 I75 -5.1 -3.5 -7.6	5/74	1/75	+6	+14
1/80	7/80	6	I79 II79[g] 0.0 -0.4	11/78	7/79	-14[i]	-6[i]
			II80 III80 -9.1 0.3	2/80	10/80	+1	+9
7/81	11/82	16	IV81 I82[h] -5.5 -5.9	8/81	4/82	+1	+9
			III82 IV82 -3.2 0.6	5/82	1/83	+10[i]	+18[i]
Mean (Standard Deviation)		11(4)				0(3)	+8(3)

Table 1
(continued)

B. Based on the Earliest Available Preliminary Data[j]

Business Cycle Dates of Peak (1)	Business Cycle Dates of Trough (2)	Recession Duration (Months) (3)	Growth in Nominal GNP (1948-61) or in Real GNP (1960-1982) from Preceding Quarter (SAAR)[b] (4)	Peak Signal Date[c] (5)	Data Release Date[d] (6)	Signal Lead (-) or Lag (+), in months[e] (7)	Recognition Lead (-) or Lag (+), in months[f] (8)
			I. Nominal GNP[k]				
11/48	10/49	11	I49 II49 III49 IV49 -12.0 -10.1 -5.2 1.0-	11/48	7/49	0	+8
7/53	5/54	10	III53 IV53 I54 II54 -2.1 -6.7 -6.4 0.2	5/53	1/54	-2	+6
8/57	4/58	8	IV57 I58 -6.9 -10.2	8/57	4/58	0	+8
4/60	2/61	10	II60 III60 IV60 -1.2 0 -3.0	2/60	10/60	-2[i]	+6[i]
			II. Real GNP[k]				
4/60	2/61	10	III60 IV60 I61 -3.8 -0.9 -3.5	5/60	1/61	+1	+9
12/69	11/70	11	IV69 I70 II70 -0.4 -1.6 -1.4	8/69	4/70	-4	+4
11/73	3/75	16	I74 II74 III74 IV74 I75 II75 -6.1 -1.9 -2.6 -9.5 -11.1 -1.5	11/73	7/74	0	+8
1/80	7/80	6	II80 III80 -9.6 +0.3	2/80	10/80	+1	+9
7/81	11/82	16	IV81 I82[l] -4.5 -3.9	8/81	4/82	+1	+9
			III82 IV82 0.0 -1.1	5/82	1/83	+10[i]	+18[i]
Means (Standard Deviations)		11(4)				0(2)	+8(2)

[a]From the February 1986 issue of Business Conditions Digest (BCD).

[b]The identified periods include all those with at least two consecutive quarters of growth less than 1% at seasonally adjusted annual rate (SAAR).

[c]Mid-month of the quarter preceding the quarter with real growth rate of less than one percent (see the first listing in column 4).

[d]Assumed to be the first month following the second quarter with real growth of less than one percent (see the second listing in column 4).

[e]Measured from the monthly business cycle peak date (column 1) to the peak signal date (column 5).

[f]Measured from the monthly business cycle peak date (column 1) to the data release date (column 6).

[g]The intervening quarters, III79, IV79, and I80, had growth rates of 3.7%, -0.8%, and 4.1%, respectively.

[h]The intervening quarter, II82, had a growth rate of 1.2%.

[i]Excluded from the averages shown below.

[j]Compiled from successive issues of the Survey of Current Business (SCB) and BCD.

[k]Real GNP estimates were first published in SCB October 1959 and in the biennial supplement to SCB Business Statistics, 1959 edition. Hence nominal GNP estimates only are used here for the period 1948-58. For 1960-61 both nominal and real GNP estimates are used. See text.

[l]The intervening quarter, II82, had a growth rate of 1.7% according to preliminary data (from BCD July 1982).

Table 2
Forecasting Recessions Under the Criterion of Two Consecutive Declines in Real GNP, ASA-NBER Survey Medians, 1969-82

Business Cycle Recession		Recession Duration (months)	Preliminary Actual Changes[a] 2nd Previous Quarter (Q_{-1})		Previous Quarter (Q_0)	Forecasts of Changes in Successive Quarters[b]					Peak Signal Date[c]	Survey Release Date[d]	Signal Lead (-) or Lag (+) in months[e]	Recognition Lead (-) or Lag (+) in months[f]
Peak	Trough		Date	Percent		Q_1	Q_2	Q_3	Q_4	Q_5				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
12/69	11/70	11	IV69	-0.4	-1.6	-1.2	2.8	4.5	3.2	13.0	8/69	6/70	-4	+5
11/73	3/75	16	III73	3.4	1.3	-2.4	-0.4	2.4	3.6	4.5	11/73	3/74	0	+4
			IV73	1.6	-5.8	-0.4	2.0	4.1	3.2	3.6	11/73	6/74	(0)	(+7)
			II74	-1.6	-2.9	-4.5	-2.4	1.6	2.8	4.9	11/73	12/74	(0)	(+13)
			III74	-1.9	-9.1	-6.6	0.0	3.2	5.3	5.7	11/73	3/75	(0)	(+16)
			IV74	-9.6	-11.2	-1.2	3.6	6.1	5.3	6.1	11/73	6/75	(0)	(+19)
1/80	7/80	6	III78	2.6	6.1	2.4	1.2	-1.2	-0.8	2.8	5/79	3/79	(-8)F	(-10)F
			IV78	6.9	0.7	1.6	-1.2	-1.6	1.6	0.4	5/79	6/79	(-8)F	(-7)F
			I79	1.1	-3.3	-1.6	-3.2	-1.2	2.0	3.6	2/79	9/79	(-13)F	(-4)F
			II79	-2.3	2.4	-1.6	-4.1	-2.8	1.6	3.2	8/79	12/79	-5	-1
			III79	3.1	1.4	0.4	-2.8	-0.8	1.2	2.0	2/80	3/80	(+1)	(+2)
			IV79	2.0	1.1	-5.3	-4.1	-1.2	2.4	3.2	2/80	6/80	(+1)	(+5)
			I80	1.2	-9.1	-4.5	-0.8	3.2	3.2	4.1	2/80	9/80	(+1)	(+8)
7/81	11/82	16	II81	-1.6	-0.6	-3.6	-0.8	3.6	4.9	4.9	2/81	12/81	-5	+5
			III81	1.4	-5.2	-2.8	2.4	4.5	4.9	2.8	8/81	3/82	(+1)	(+8)
Mean (Standard deviation)		12(5)											-4(2)	+3(3)

[a] Based on the data available to the forecasters. Q_0 = quarter preceding the survey quarter (Q_1). Entries in columns 5-6 are at annual rates.
[b] Taken from ASA-NBER quarterly forecast releases. Quarterly percentage changes given in the source are converted to compound annual rates.
[c] Mid-month of the quarter preceding the first quarter in which real GNP declined.
[d] Last month of the survey quarter (Q_1).
[e] Measured from the business cycle peak date (column 1) to the peak signal date (column 12). The leads or lags in parentheses refer to secondary signals and are excluded from the averages below. F = false signal.
[f] Measured from the business cycle peak date (column 1) to the survey release date (column 13). See note e.

Table 3

Forecasting Recessions Under the Criterion of Two Consecutive Declines in Real GNP, Blue Chips Survey Means, 1979-82

Business Cycle Recession Peak (1)	Trough (2)	Recession Duration (months) (3)	Preliminary Actual Changes[a] 2nd Previous Quarter (Q_{-1}) Date (4)	Percent (5)	Previous Quarter (Q_0) (6)	Forecasts of Changes in Successive Quarters[b] Q_1 (7)	Q_2 (8)	Q_3 (9)	Q_4 (10)	Q_5 (11)	Peak Signal Date[c] (12)	Survey Release Date[d] (13)	Signal Lead (-) or Lag (+) in months[e] (14)	Recognition Lead (-) or Lag (+) in months[f] (15)
1/80	7/80	6	III78	2.6	6.9	2.5	1.4	-0.9	-0.6	0.3	5/79	4/79	(-8)	(-9)F
			III78	2.6	6.9	1.5	2.7	-0.2	-0.7	0.4	5/79	5/79	(-8)	(-8)F
			IV78	6.9	0.4	1.7	-0.5	-1.3	-0.1	1.9	5/79	6/79	(-8)	(-7)F
			IV78	6.9	0.8	-0.9	-1.2	-1.5	0.3	1.9	2/79	7/79	(-11)	(-6)F
			I79	1.1	-3.3	-1.2	-2.4	-0.1	2.1	3.5	2/79	8/79	(-11)	(-5)F
			I79	1.1	-2.4	-1.5	-2.7	-0.2	1.9	3.3	2/79	9/79	(-11)	(-4)F
			I79	1.1	-2.3	0.4	-2.3	-1.6	1.0	3.2	8/79	10/79	(-5)	(-3)F
			II79	-2.3	2.4	-1.4	-3.3	-1.7	1.6	3.1	8/79	11/79	-5	-2
			II79	-2.3	3.5	-1.5	-3.8	-2.1	1.2	3.0	8/79	12/79	(-5)	(-1)
			II79	-2.3	3.1	0.3	-3.4	-2.9	0.3	2.3	11/79	1/80	(-2)	(0)
			III79	3.1	1.4	-1.5	-2.4	-0.3	2.1	n.a.	11/79	2/80	(-2)	(+1)
			III79	3.1	2.1	0.4	-1.9	-0.9	0.7	n.a.	2/80	3/80	(+1)	(+2)
			III79	3.1	2.0	1.3	-2.1	-3.1	-0.7	1.0	2/80	4/80	(+1)	(+3)
			IV79	2.0	1.1	-3.5	-4.0	-1.9	0.2	n.a.	2/80	5/80	(+1)	(+4)
			IV79	2.0	0.6	-7.0	-4.4	-1.2	1.3	2.9	2/80	6/80	(+1)	(+5)
			IV79	2.0	1.2	-8.2	-4.8	-1.2	1.9	3.3	2/80	7/80	(+1)	(+6)
			I80	1.2	-9.1	-4.4	-0.8	2.3	3.3	4.0	2/80	8/80	(+1)	(+7)
			I80	1.2	-9.0	-3.3	0.1	2.1	3.4	4.4	2/80	9/80	(+1)	(+8)

Table 3 (continued)

Business Cycle Recession Peak (1)	Business Cycle Recession Trough (2)	Recession Duration (months) (3)	Preliminary Actual Changes[a]: 2nd Previous Quarter (Q_{-1}) Date (4)	Preliminary Actual Changes[a]: 2nd Previous Quarter (Q_{-1}) Percent (5)	Preliminary Actual Changes[a]: Previous Quarter (Q_0) (6)	Forecasts of Changes in Successive Quarters[b]: Q_1 (7)	Q_2 (8)	Q_3 (9)	Q_4 (10)	Q_5 (11)	Peak Signal Date[c] (12)	Survey Release Date[d] (13)	Signal Lead (-) or Lag (+) in months[e] (14)	Recognition Lead (-) or Lag (+) in months[f] (15)
7/81	11/82	16	I81	8.6	-1.9	-0.7	2.6	3.8	4.1	4.7	2/81	8/81	-5	+1
			I81	8.6	-2.4	-0.5	1.7	3.3	4.1	4.8	2/81	9/81	(-5)	(+2)
			I81	8.6	-1.6	-0.8	0.5	2.6	3.6	4.8	2/81	10/81	(-5)	(+3)
			II81	-1.6	-0.6	-2.6	0.6	3.2	5.0	5.0	2/81	11/81	(-5)	(+4)
			II81	-1.6	0.6	-4.9	-0.8	2.8	5.5	5.4	7/81	12/81	(0)	(+5)
			III81	1.4	-5.2	-1.1	2.9	5.4	5.2	4.2	7/81	1/82	(0)	(+6)
			III81	1.4	-5.2	-2.1	2.4	5.0	5.1	4.3	7/81	2/82	(0)	(+7)
			III81	1.4	-4.7	-2.8	1.7	4.2	4.7	3.5	7/81	3/82	(0)	(+8)
			III81	1.4	-4.7	-4.0	1.5	4.5	4.6	3.6	7/81	4/82	(0)	(+9)
Mean (Standard deviation)		11(7)											-5(0)	0(2)

n.a. Not available.

[a]Based on the data available to the forecasters. Q_0 = quarter preceding the survey quarter (Q_1). Entries in columns 5-6 are at annual rates.

[b]Averages of forecasts published monthly in BLUE CHIP Economic Indicators by Eggert Economic Enterprises, Inc., Sedona, AZ. All entries are at annual rates.

[c]Mid-month of the quarter preceding the first quarter in which real GNP declined.

[d]Taken from the BLUE CHIP monthly release.

[e]Measured from the business cycle peak date (column 1) to the peak signal date (column 12). The leads or lags in parentheses refer to secondary signals and are excluded from the averages below. F = false signal.

[f]Measured from the business cycle peak date (column 1) to the survey release date (column 13). See note e.

Table 4
Five Sets of Recession Signals from Data and Forecasts, Timing Comparisons, 1948-1981

Business Cycle Peak (1)	Recognition Lead (-) or Lag (+) in Months: Preliminary GNP Data[a] (2)	ASA-NBER Survey Forecasts[b] (3)	Blue Chip Survey Forecasts[c] (4)	Leading and Coincident Indicators[d] (5)	Unemployment Rate Forecasts[e] (6)
November 1948	+8	n.a.	n.a.	n.a.	+2
July 1953	+6	n.a.	n.a.	+2	+6
August 1957	+8	n.a.	n.a.	+1	-1
April 1960	+9	n.a.	n.a.	+5	+3
December 1969	+4	+5	n.a.	+4	+7
November 1973	+8	+4	n.a.	+4	+2
January 1980	+9	-1	-2	+2	0
July 1981	+9	+5	+1	+3	+6
Means (Standard Deviations)[f]					
1948-81(8 peaks)	+8(2)	n.a.	n.a.	n.a.	+3(3)
1953-81(7 peaks)	+8(2)	n.a.	n.a.	+3(1)	+3(3)
1969-81(4 peaks)	+8(2)	+3(3)	n.a.	+3(1)	+4(3)
1980-81(2 peaks)	+9(0)	+2(4)	0(2)	+2(1)	+3(4)

[a]From Table 1, part B, column 8.
[b]From Table 2, column 15.
[c]From Table 3, column 15.
[d]From Moore, 1983, chapter 4, Table 4-7 and page 54. The signals used are P3, based on first revised data prior to October 1976, preliminary data since then. See text.
[e]From Moore, 1985, Table 3. See text.