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Chapter 4

PERFORMANCE OF INDIVIDUAL INDICATORS

Behavior at Successive Turning Points

So far we have seen that most of the leading and lagging indicators that display consistent behavior at classical cycle turning points in the United States have a similar record of leading and lagging growth cycle turning points in at least nine additional countries. This finding corroborates our original supposition that if indicators in other market-oriented economies were selected on the same principles as employed for indicators in the U.S. economy, the foreign indicators would perform in a similar manner. The ten countries represent different stages of industrial development, different degrees of reliance on market forces, and a variety of economic policies. But the indicator systems we have developed suggest that the cyclical interrelations among economic processes are quite similar in each of them.

It is perhaps well to recall that by calling the ten economies under study "market-oriented" we mean to convey that they all fit the Burns-Mitchell criterion of economies that organize their work mainly in business enterprises.¹ The fact that the Burns-Mitchell technique of dating cyclical turns, and of developing leading, coincident, and lagging indicators of these turns, can be said to work reasonably well in all ten nations is proof anew that Mitchell's initial concept of the business cycle still serves as an appropriate point from which to consider the nature of economic instability in the modern world. We must also remind the reader that the indicators included in this study constitute only the earliest of our experiments in developing growth cycle indicators in industrialized economies. We have

made very few substitutions, deletions, or additions to our original list of indicators. We thus recognize the need for future adjustments in the selection of indicators for each of the foreign countries, corresponding to the continuing efforts to improve the system in the United States.

Our task in this chapter is to present the evidence and assess the record, turn by turn, indicator by indicator, and country by country. Supporting statistics can be found in Appendix 4B. The essential story in this chapter is provided in Appendix 4A, which shows the graphs of each of the ten countries. The results of the history, turn by turn, are summarized in the chapter tables.

THE UNITED STATES

Information essential for analyzing growth cycle indicators in the United States since World War II is provided in Figure 4A-1. The information contained in the graphs is particularly important because it enables us to make a direct comparison of indicators that are reasonably reliable at classical cycle turning points. Since very few countries outside the United States currently monitor classical cycles, it is essential to know whether indicators of classical turns are reliable indicators of growth turns. We have previously noted that growth cycle peaks tend to precede classical peaks, while troughs exhibit more or less the same timing (or perhaps a short lag). Because a direct comparison of the behavior of identical indicators at growth cycle and classical cycle turns over a long period can be made only for the United States, this step is critical in the appraisal of indicators in other economies. Where indicators behave differently we should, of course, like to know whether it is because the series chosen is a poor equivalent to the U.S. indicator we are attempting to approximate, or whether there is a real divergence between the United States and another country in terms of how the series behaves cyclically. The behavior of U.S. indicators during growth cycles is, therefore, of critical importance to this study.²

It is useful to recall that a major change in moving from classical cycle to growth cycle measurement for the United States was the addition of three "growth recessions" to the chronology between 1948 and 1971. Changes have also been made in the dating of turning points, notably at peaks.³ Because there have been relatively few postwar classical cycles in the case of some other economies, the ability of the growth cycle measurement technique to identify new cyclical episodes (and thereby increase the number of turning points to be

studied) is of considerable benefit in testing indicator behavior. It is, therefore, important to note that the three additional recessions—in 1951-52, 1962-64, and 1966-67—can be discerned in Figure 4A-1 in the behavior of most of the indicators. Among the roughly coincident indicators, which determine the growth cycle turns, the only series that fail to match all of the additional growth cycles are the unemployment rate and real personal income, both of which skipped the 1951-52 growth recession. The leading indicators conform about as well to the additional growth recessions as to the other recessions. The lagging indicators fail more often to reflect the additional recessions, doubtless reflecting the general insensitivity of lagging series.

Since the U.S. indicators were selected in 1966, it is of interest to see how they behaved in the decade of the 1970s. All of the indicators in each of the three timing categories reflect the 1973-75 recession. During the 1978-82 growth recession the stock market produced an early—therefore, extra—cycle, but failed to exhibit a peak near the 1978 peak. The ratio of price to unit labor cost produced several turns in the late 1970s. These turns were selected by the computer but were rejected judgmentally because of their small size and short duration. This leading indicator, therefore, displays a very early peak and a trough in 1980. All the coincident and lagging indicators reflect this recession.

These findings have led us to conclude that the technique for dating and measuring growth cycles has sufficient independent validity so that indicators selected on the basis of classical cycle behavior conform as well to recessions that are unique to the growth chronology as to those that are common to both the growth and the classical chronologies. Due to the absence of classical cycle chronologies for most market-oriented economies, and particularly because relatively little has been done to develop quantitative indicators of classical cycles abroad, this finding is important. It suggests the possibility that we can reason from growth cycles back to classical cycles. That is, if the indicators work well in dating and anticipating growth cycle turns in foreign countries, they could also be employed (as traditionally they have been employed in the United States) to date classical cycles and to lead and lag them in a similar manner.⁴

In this connection Mintz observed that “in all the series, the amplitudes of deviation [i.e., growth] cycles which correspond to classical business cycles are much larger than those of cycles which do not. . . .”⁵ Thus, amplitudes in general were smaller in the 1960s than in the 1950s. Indeed it is only with the growth cycle technique that the interrelationships at work among the indicators during the 1960s can

Table 4-1. Leads and Lags at U.S. Growth Cycle Turns, Three Groups of U.S. Indicators, 1948-81.

	Median Lead (-) or Lag (+), in Months, at U.S. Growth Cycle Peaks (P) and Troughs (T)									
	P 7/48	T 10/49	P 3/51	T 7/52	P 3/53	T 8/54	P 2/57	T 4/58	P 2/60	T 2/61
6 Lagging Indicators Inverted ^a	n.c. ^b	-15	-13	-6	-7	-11	-22	-9	-18	-8
12 Leading Indicators	-1	-5	-2	-10	-3	-9	-15	-2	-9	-1
6 Roughly Coincident Indicators	-2	0	-3	0	+1	0	0	0	0	0
6 Lagging Indicators	0	+4	+10	+1	+6	+8	+5	+4	+4	+5

Notes:

a. Median peaks in lagging group are compared with growth cycle troughs, and median troughs are compared with growth cycle peaks.

b. n.c. = no timing comparison.

Source: Appendix Table 4B-1.

be usefully examined at all. Moreover, the amplitudes of the 1970s appear more like those of the 1950s for a good many of the indicators, thus corroborating Mintz's original observation concerning the relative amplitudes of growth and classical cycles.⁶

The leads and lags of the twenty-six indicators included in Figure 4A-1 at each of the twenty U.S. growth cycle turning points are detailed in Appendix Table 4B-1. Table 4-1 summarizes this behavior by recording the median lead or lag for each of the three classifications of indicators at each growth cycle peak and trough. Where indicator turns cannot be matched with growth cycle turns, or where the data are not available, the number of indicators in each group from which medians can be derived is reduced. However, as a rule the median represents a reasonably large part of the total group of indicators.

The behavior of U.S. indicators summarized in Table 4-1 throws light on two major questions. First, how many exceptions to the rules governing the *timing* classification into leading, roughly coincident, or lagging indicators does the table reveal? That is, how often is a median for the leading indicators found not to lead, the median for

Table 4-1. continued

Median Lead (-) or Lag (+), in Months, at U.S. Growth Cycle Peaks (P) and Troughs (T) (continued)									Medians at		
P	T	P	T	P	T	P	T	P	P	T	P & T
5/62	10/64	6/66	10/67	3/69	11/70	3/73	3/75	12/78			
-10	-24	-24	-12	-11	-14	-12	-8	-35	-13	-11	-12
-3	-9	-4	-8	-2	-1	-1	0	-2	-2	-5	-2
-2	0	-4	0	+1	0	+3	0	+3	0	0	0
+5	-4	+4	+6	+6	+16	+16	+10	+10	+6	+5	+5

the laggings found not to lag, and the median for the roughly coincident indicators found not to "roughly" coincide?⁷

Table 4-1 shows that there are only four (including zero timing) exceptions, one in each category. The median for the leading indicators is zero at the 1975 trough; and there is a four-month lead at the 1966 peak among the roughly coincident indicators and among the lagging indicators and zero timing at the 1948 peak and a four-month lead at the 1964 trough. Overall, then, the indicators conform to their designated classifications with a success rate of 96.5 percent (or 93.9% if one includes the zeros at the 1948 peak and the 1975 trough as exceptions). This conformity to expectations for the three groups of indicators is very high indeed, especially since it applies to a period extending well beyond 1966, when the indicators were selected and classified.

A second question is whether the *sequence* of turns shown by the three groups of indicators (excluding the turns of the inverted lagging indicators) is what we would expect.⁸ That is, even if the median timing for all three groups showed a lag it could be said to conform to our expectations if these lags were +2, +4, and +6, with leaders showing the earliest turn, and laggings the latest. We find five exceptions in the table. Two of these exceptions occur early. At the 1948 peak the median timing for the roughly coincident indicators occurs before the turn in the leading indicators; at the 1951 peak the

roughly coincident indicators also turn ahead of the leading indicators; at the 1964 trough the laggings show a median timing that occurs before that in the roughly coincident indicators; at the 1966 peak the leading and coincident groups show identical timing; and this is again the case at the 1975 trough.

Ignoring cases where two groups of indicators show identical median turns, we can therefore say that for the nineteen turning points studied, in only three instances (16%) do the groups fail to show the expected sequential pattern: at the 1948 peak, the 1951 peak, and the 1964 trough. For the three major indicator groups the expected sequence is visible among the medians for the groups 87 percent of the time (92% if medians showing the same timing are regarded as consistent with rather than contrary to the expected sequence of turns). By this test, the timing of the indicators at growth cycle turns is about as consistent as it is at classical cycle turns.

The behavior of the inverted laggings, shown at the top of the table, is another test of the indicator system. Many lagging indicators, especially those that reflect the costs of doing business, can be viewed as having an inverse effect on investment and other decisions. Hence, it is logical to treat their turns in inverted fashion with respect to the following turning point, which they lead. Lagging indicators at troughs can thus be viewed as leading the subsequent peak, and lagging indicators at peaks can be viewed as leading the subsequent trough. As Table 4-1 shows, inverted lagging indicators usually lead by intervals that are far longer than leading indicators do. Since 1948 there have been no failures to lead among the medians for inverted lagging indicators in the United States. This aspect of the sequence, which was observed in the 1950 study of classical cycles, as well as in subsequent studies, holds true for growth cycles as well.⁹ If we include the inverted laggings the expected sequence of turns among the medians for each group appears 89 percent of the time (or 93% if tied medians are accepted as consistent with the "expected sequence").

The average duration of U.S. postwar growth cycles has been about three years, and it is clear that indicators will customarily reflect growth cycle turning points with turns of their own spread out at various points throughout the cycle. The full range around peaks (as shown in the averages) is from a lead of thirteen months for the inverted laggings to a lag of six months for the laggings, or nineteen months in all. The comparable range at troughs averages sixteen months. The Burns-Mitchell view, that business cycles are phenomena in which "one phase merges imperceptibly into the next," is

thus an accurate one. Significant aspects of economic activity reflect or anticipate these phase changes throughout the growth cycle.

Having observed that indicators of classical cycles in the United States can indeed faithfully reflect growth cycle turning points,¹⁰ we are now in a position to consider, turn by turn, how equivalents to these indicators perform in other economies.

CANADA

The growth cycle chronologies for Canada and the United States show that their economic swings are closely linked. Except for the Canadian growth recession in 1976-77 (which was not matched by a recession in the United States) both countries experienced roughly comparable recessions during the period covered in our study. The Canadian equivalents to the U.S. list of indicators (Figure 4A-2) exhibit a rather large percentage of skipped and extra cycles, but conformity to the expected *timing* among medians for the three groups of indicators is quite high. If we examine Table 4-2 to see whether Canadian leaders do, in fact, lead, laggards lag, and roughly coincident indicators turn within three months of the reference date, we find only twelve exceptions out of a total of fifty-eight observations. Among the leading indicators, there are short lags at the 1953, 1969, and 1976 peaks, and at the 1951, 1970, 1977, and 1980 troughs. Among the coincident indicators, we note three exceptions at the 1975, 1976, and 1979 turns. Among the lagging indicators, there are two exceptions—the leads at the 1953 and 1975 turns. We may conclude, however, that the timing averages among the Canadian indicators conform reasonably well to expectations based upon U.S. experience.

Table 4-2 also reveals six exceptions to the expected *sequential* order in Canada, but if one includes identical timing as perverse, the number of exceptions totals eight. Perverse timing occurs at the 1951 trough, the 1953 peak (twice), the 1969 peak, the 1970 trough, the 1975 trough, the 1979 peak and the 1980 trough. Identical timing occurs at the 1975 and 1980 troughs. These statistics produce a success rate of 84 percent if identical timing is not regarded as a failure. If we include identical timing in our definition of perverse timing the success rate is reduced to 79 percent. If one includes the inverted laggards, the success rate (excluding ties) rises to 89 percent, since there are no perverse timings among the seventeen sequences involving the inverted lagging and leading indicators. Including ties as perverse reduces the success rate to 85 percent. As was the case

Table 4-2. Leads and Lags at Canadian Growth Cycle Turns, Three Groups of Canadian Indicators, 1951-81.

	<i>Median Lead (-) or Lag (+), in Months, at Canadian Growth Cycle Peaks (P) and Troughs (T)</i>									
	<i>P</i> 4/51	<i>T</i> 12/51	<i>P</i> 3/53	<i>T</i> 10/54	<i>P</i> 10/56	<i>T</i> 8/58	<i>P</i> 11/59	<i>T</i> 3/61	<i>P</i> 3/62	<i>T</i> 5/63
6 Lagging Indicators, Inverted ^a	n.c. ^b	n.c.	n.c.	-25	-16	-11	-12	-14	-9	-13
12 Leading Indicators	-3	+1	+2	-4	-7	-8	-2	-4	-2	-2
6 Roughly Coincident Indicators	-1	0	0	-2	0	0	0	0	-1	0
6 Lagging Indicators	n.c.	n.c.	-6	+8	+11	+3	+2	+3	+1	+1

Notes:

a. Median peaks in lagging group are compared with growth cycle troughs, and medians and troughs are compared with growth cycle peaks.

b. n.c. = no timing comparison.

Source: Appendix Table 4B-2.

with median timings, most of these exceptions occur during the 1970s. Why the Canadian indicator system has, in general, behaved less well during the recent past ought to be a subject for future investigation.

THE UNITED KINGDOM

As can be observed in Figure 4A-3 and Table 4-3, all of the leading indicator medians for the United Kingdom lead at the reference turns. Only one of the roughly coincident indicators shows a median timing of more than three months lead or lag (a lead of four months at the 1955 peak), and all of the lagging indicator medians lag except for the exact coincidence at the 1966 peak. This is a very good record for expected timing among the indicator medians.

Concerning the expected temporal sequence at each turn, the patterns produced by the British indicator medians conform highly to predictions based on U.S. experience. Only one discrepancy appears before 1972—the identical timing for medians in the roughly coinci-

Table 4-2. continued

<i>Median Lead (-) or Lag (+), in Months, at Canadian Growth Cycle Peaks (P) and Troughs (T) (continued)</i>										<i>Medians at</i>		
<i>P</i>	<i>T</i>	<i>P</i>	<i>T</i>	<i>P</i>	<i>T</i>	<i>P</i>	<i>T</i>	<i>P</i>	<i>T</i>	<i>P</i>	<i>T</i>	<i>P & T</i>
3/66	2/68	2/69	12/70	2/74	10/75	5/76	7/77	9/79	6/80			
-33	-18	-8	-15	-15	-10	-12	-6	-12	-5	-12	-13	-12
-9	-8	+2	+4	-1	-6	+1	+2	-1	+1	-2	-3	-2
-1	0	0	0	0	-5	+4	+3	-6	+1	0	0	0
+5	+4	+7	+23	+10	-5	+8	+14	+4	+4	+5	+4	+4

dent and lagging indicator groups at the 1966 peak. At the 1973 peak, where one finds the only example of unexpected indicator behavior, the median for the leaders turns two months after the median for the roughly coincident indicators.

Of the thirty-seven sequences under review, the expected sequence appears 97 percent of the time. This figure would drop to 96 percent if one were to exclude inverted laggings. And if identical timing is regarded as perverse, the success rate would stand at 94 percent for all sequences; or 92 percent without the inverted laggings. This record conforms very closely to preliminary results obtained with a somewhat different chronology.¹¹

In the present study, leaders lead and laggings lag by slightly longer periods, with the result that the spread among indicator turns is correspondingly increased. Beyond this, though, there appears to be no reason to alter Klein's original assessment that the experience of the United Kingdom during the past quarter century confirms and extends Ilse Mintz's finding that the NBER method of measuring business cycles can be successfully applied not only to growth cycles but to other industrial, market-oriented economies. The relationships involved appear to be as widely applicable, on this evidence at least, as Burns and Mitchell originally assumed.¹²

Table 4-3. Leads and Lags at British Growth Cycle Turns, Three Groups of British Indicators, 1951-81.

	Median Lead (-) or Lag (+), in Months, at British Growth Cycle Peaks (P) and Troughs (T)																
															Medians at		
	P	T	P	T	P	T	P	T	P	T	P	T	P	T	P	T	P
3/51	8/52	12/55	4/58	3/61	2/63	2/66	8/67	6/69	2/72	6/73	8/75	6/79					
6 Lagging Indicators, Inverted ^a	n.c. ^b	-11	-33	-18	-30	-21	-27	-18	-18	-20	-12	-17	-38	-28	-18	-19	
12 Leading Indicators	n.c.	-2	-5	-4	-12	-8	-16	-6	-6	-10	+2	-3	-1	-6	-5	-6	
6 Roughly Coincident Indicators	+1	+2	-4	0	0	0	0	-3	-5	0	0	+6	0	0	0	0	0
6 Lagging Indicators	+6	+7	+10	+5	+2	+9	0	+4	+12	+4	+12	+8	+6	+6	+6	+6	+6

Notes:

a. Median peaks in lagging group are compared with growth cycle troughs, and median troughs are compared with growth cycle peaks.

b. n.c. = no timing comparison.

Source: Appendix Table 4B-3.

WEST GERMANY

When Mintz developed her original West German chronology, basing it largely on a collection of roughly coincident indicators, she summarized the evidence by noting, "Perhaps the most important feature brought out in these tables is the regularity with which all the indicators turn near all the business cycle turns."¹³ This is perhaps still the most important finding with respect to the behavior of the coincident indicators, not only in the case of West Germany, but in the other economies under study as well. The performance of the indicator system in West Germany, however, is somewhat uneven (see Figure 4A-4 and Table 4-4.

Among the leading indicators, the median fails to conform twice—at the trough in 1963 (+1) and at the peak in 1955 (+14). Among the roughly coincident indicators, there are three exceptions—at the 1975 peak (-6) and the 1980 peak (-4) and at the trough in 1971 (+5). Among the lagging indicators, an exact coincidence appears at the 1970 peak.

The basic timing classification for the medians at all turns is as expected 87 percent of the time (and 84% of the time if we include the exact coincidence as perverse). If we exclude the lagging indicators in inverted form, we have thirty-one observations for West Germany, and the percentage of median timing conforming to expectations is 84 percent excluding the exact coincidences (or 81% including them). These percentages are about the same as for Canada.

When we ask whether the medians for the groups of indicators at each turn are in the appropriate sequence we find that among the inverted laggings versus the leading indicators there are no exceptions; among the leading versus the roughly coincident indicators, there are two failures to conform out of eleven comparisons, plus one case of identical timing. Among the roughly coincident versus lagging indicators, there is one instance of identical timing, but no perverse timing. In sum, 92 percent of the time the sequence is what we would expect (if we include the coincidences as perverse, the percentage is 84%). If we confine our attention to the three major indicator groups and ignore the behavior of the lagging indicators in inverted form, the success rate is 89 percent (78% including the identical timing as perverse).

In the case of West Germany, the success rate is equivalent to more than three-quarters of all the sequential observations that we can make. It is unfortunate that the exceptions are concentrated in the behavior of the leading indicators relative to the roughly coinci-

Table 4-4. Leads and Lags at West German Growth Cycle Turns, Three Groups of West German Indicators, 1951-81.

	Median Lead (-) or Lag (+), in Months, at West German Growth Cycle Peaks (P) and Troughs (T)																	
	Medians at												Medians at					
	P	T	P	T	P	T	P	T	P	T	P	T	P	T	P	T	P	T
	2/51	2/54	10/55	4/59	2/61	2/63	5/65	8/67	5/70	12/71	8/73	5/75	2/80	P	T	P	T	P & T
5 Lagging Indicators, Inverted ^a	n.c. ^b	n.c.	n.c.	n.c.	n.c.	n.c.	-19	-17	-29	-19	-14	-14	-56	-24	-17	-19		
7 Leading Indicators	n.c.	n.c.	+14	-6	-10	+1	-3	-4	-9	-4	-6	-6	-14	-8	-4	-7		
7 Roughly Coincident Indicators	0	0	+2	+1	0	0	0	+3	0	+5	-6	+1	-4	0	+1	0		
5 Lagging Indicators	n.c.	n.c.	n.c.	n.c.	n.c.	+8	+10	+4	0	+6	+7	+2	n.m. ^c	+7	+5	+6		

Notes:
 a. Median peaks in lagging group are compared with growth cycle troughs, and median troughs are compared with growth cycle peaks.
 b. n.c. = no timing comparison.
 c. n.m. = no matching turn.
 Source: Appendix Table 4B-4.

dent indicators. In forecasting economic activity this is the very comparison likely to receive the most attention. It is well to recall, however, that the virtual absence of classical recessions in West Germany until the 1970s made conventional analysis of cyclical behavior in general, as well as indicator analysis in particular, all but impossible for the postwar period. In a sense, therefore, the German evidence is the clearest thus far in suggesting that the sequence of turns in leading, roughly coincident, and lagging indicators is transferable from classical to growth cycles. It might have been argued, for example, that this transferability occurs only because roughly coterminous classical cycles accompany the growth cycles. In Germany the expected results appear even during periods when there are virtually no classical cycles. As will be seen, this is equally true of Japan, and it underscores one of the useful properties of growth cycle analysis: there are times when it is a prerequisite to any cyclical analysis at all.

FRANCE

The basic information with which to assess the behavior of the indicator system in France is given in Figure 4A-5 and summarized in Table 4-5. With France we encounter the first serious obstacle to testing the indicator system in another country, because thus far we have been able to find only two series to include in the lagging indicator group. We have (reluctantly) placed these two series in the form of a composite index, but not because we have great confidence in any composite index based on so few series. However, not only are confirming indicators necessary to test the three basic indicator groups fully, but the lagging indicators in inverted form are, as we have seen, one of the best early indicators of subsequent cyclical changes in direction. Despite this drawback and for the sake of comparing French cyclical behavior with that in the other countries, we have decided to deal with what information we have. As Table 4-5 suggests, the incentive to find more lagging indicators should be high. Even the little information we have conforms quite as we would expect—the inverted laggings show (mostly) long leads, and the lagging indicators show median lags at each growth cycle turn. In terms of whether the median timing in each indicator group conforms to the basic timing expected, the data indicate a positive correlation for all turns involving the lagging indicators, both in their inverted and regular form. The leading indicators show leads with but one exception (the 1971 trough) while the roughly coincident indicators display one discrepancy from the required turn of three months (or less) from the growth cycle turn. The exception is at the peak in

Table 4-5. Leads and Lags at French Growth Cycle Turns, Three Groups of French Indicators, 1957-81.

	Median Lead (-) or Lag (+), in Months, at French Growth Cycle Peaks (P) and Troughs (T)														
	8/57						8/59						Medians at		
	P	T	P	T	P	T	P	T	P	T	P	T	P	T	P & T
2 Lagging Indicators, Inverted ^a	n.c. ^b	n.c.	n.c.	n.c.	n.c.	n.c.	-17	-20	-18	-7	-44	-18	-14	-18	
6 Leading Indicators	-1	-16	-5	-12	-4	-4	-2	+4	-11	-4	-2	-3	-4	-4	
5 Roughly Coincident Indicators	-2	-1	+2	-3	0	0	-12	+3	0	0	0	0	0	0	
2 Lagging Indicators	n.c.	n.c.	n.c.	n.c.	n.c.	+1	+4	+12	+6	+6	n.m. ^c	+5	+6	+6	

Notes:

- a. Median peaks in lagging group are compared with growth cycle troughs, and median troughs are compared with growth cycle peaks.
 - b. n.c. = no timing comparison.
 - c. n.m. = no matching turn.
- Source: Appendix Table 4B-5.

1969. This gives the French indicator system a success rate of 93 percent (or 94% if we include the lagging indicators in inverted form).

If we consider whether the French indicator system displays the expected sequence of turns for the groups of indicators of each growth cycle turn, data show that the only discrepancies occur in the relationship between the leading and roughly coincident indicators. Three exceptions out of eleven sequences can be observed. They occur at 1957 peak, the 1969 peak, and the 1971 trough. This relationship is the one most widely watched in any indicator system, and it is unfortunate that in France the success rate is only 73 percent. This poor showing underscores the importance of enriching the indicator system in France, because if we include the lagging indicators in the sequences to be monitored we find that the French performance is what is expected in 81 percent of the sixteen sequences (and 86% if we include the inverted lagging indicators and increase the observations to twenty-one). While expected indicator behavior in France is slightly lower than that observed generally in the countries considered earlier, it is still quite high. An increase in the number of indicators in the future can be expected to improve the representativeness of the indicator system as a reflection of French economic activity.

ITALY

As was the case in France, there are but two lagging indicators in the system we have developed for Italy. The basic information with which to judge the Italian economy is presented in Figure 4A-6 and is summarized in Table 4-6. The figure suggests that the system's performance is remarkably good in view of the anomalous behavior of a number of the indicators. There is, for one thing, tremendous volatility in several of these individual indicators. Industrial production, for example, a series frequently used by economists as the sole measure of cyclical activity, displays six computer-selected turning points that have been eliminated according to our judgment because of their relatively small amplitudes. (Some of these turns are even reflected in the composite index, but the amplitude is very small and the recessions have been rejected judgmentally.) There is clearly more ambiguity emerging from the computer-selected turns in the case of Italy than has been the case in any of the countries thus far analyzed. Why this should be so is still a question for future research.

It is remarkable that, despite inadequate or volatile data, the Italian indicator system works as well as it does. The median timing for the indicator groups at individual turning points conforms within an

Table 4-6. Leads and Lags at Italian Growth Cycle Turns, Three Groups of Italian Indicators, 1956-81.

	Median Lead (-) or Lag (+), in Months, at Italian Growth Cycle Peaks (P) and Troughs (T)													
	P	T	P	T	P	T	P	T	P	T	P	T	Medians at	
	10/56	7/59	9/63	3/65	8/69	9/72	4/74	5/75	12/76	12/77	2/80	P	T	P & T
2 Lagging Indicators, Inverted ^a	n.c. ^b	n.c.	n.c.	n.c.	n.c.	-27	-13	-7	-13	-12	-14	-13	-12	-13
5 Leading Indicators	+12	-10	-2	-6	-8	-10	-5	-5	0	-1	-14	-4	-6	-5
5 Roughly Coincident Indicators	0	-4	+1	0	0	+4	0	0	0	-2	0	0	0	0
2 Lagging Indicators	n.c.	n.c.	n.c.	n.c.	+10	+6	+6	+6	0	+12	n.c.	+6	+6	+6

a. Median peaks in lagging group are compared with growth cycle troughs, and median troughs are compared with growth cycle peaks.

b. n.c. = no timing comparison.

Source: Appendix Table 4B-6.

acceptable range to the definition for each timing classification. Out of eleven turns, the median timing among the leading indicators shows some lead at all the turns except the 1956 peak and 1976 peak, when the median is zero. The roughly coincident indicators show two of the medians falling outside the three-month range considered appropriate for "rough coincidence." The exceptions are the four-month lead at the 1959 trough, and the four-month lag at the 1972 trough. (Since 1972 the roughly coincident indicators have all behaved quite well for Italy, a finding that is noteworthy in view of the tendency in some countries, such as Canada, West Germany, and France, for coincident indicators to behave less well in the past dozen years or so.) The lagging indicators in Italy all lag, with the exception of a median timing of zero at the 1976 peak. In sum, the percentage of "correct" observations totals 82 percent (or 85% if we include the inverted laggings, which all display long leads).

But what about the record of sequential turns among the four groups of indicators for Italy? The leading indicators display a median that precedes the median for the roughly coincident indicators at all the reference turns except for the first peak in 1956, and trough in 1977. At the 1976 peak the two medians show identical timing. The median for lagging indicators follows the median in the roughly coincident indicators at all turns except again in the 1976 peak, when the two groups of indicators turned together. Ignoring the inverted lagging indicators, the success rate for the sequences is 88 percent (excluding the cases of identical timing) and 76 percent if identical timing is included among the perverse timing sequences. If we consider the inverted lagging indicators, the number of sequences increases from seventeen to twenty-three. Ignoring the identical timings, the success rate is 91 percent; regarding identical timing as perverse reduces the percentage to 83 percent, which is still rather high. In general, then, the results for the Italian indicator system are remarkably good, particularly in view of the difficulties with data availability and performance. Improving the data base with respect to both the quantity and quality of information is a matter to which attention must be directed in future studies of Italian business cycles.

BELGIUM

The system of economic indicators for Belgium was not developed until fairly recently, thus making the task of establishing Belgian equivalents to the 1966 U.S. indicator list more difficult than was

Table 4-7. Leads and Lags at Belgian Growth Cycle Turns, Three Groups of Belgian Indicators, 1964-81.

	<i>Median Lead (-) or Lag (+), in Months, at Belgian Growth Cycle Peaks (P) and Troughs (T)</i>									
								<i>Medians at</i>		
	<i>P</i> 10/64	<i>T</i> 7/68	<i>P</i> 9/70	<i>T</i> 7/71	<i>P</i> 7/74	<i>T</i> 10/75	<i>P</i> 6/79	<i>P</i>	<i>T</i>	<i>P & T</i>
2 Lagging Indicators, Inverted ^a	n.c. ^b	n.c.	-16	-20	-26	-9	-35	-26	-14	-20
6 Leading Indicators	-3	-4	-14	-2	-2	-2	+2	-2	-2	-2
4 Roughly Coincident Indicators	-1	-1	0	-1	-2	-4	-17	-2	-1	-1
2 Lagging Indicators	n.c.	+10	+2	+10	+6	+9	+16	+6	+10	+10

Notes:

a. Median peaks in lagging group are compared with growth cycle troughs, and median troughs are compared with growth cycle peaks.

b. n.c. = no timing comparison.

Source: Appendix Table 4B-7.

the case in the economies already discussed. Available data are presented in Figure 4A-7 and summarized in Table 4-7.

The Belgian experience provides a good example of the difficulties that can emerge in selecting an appropriate turning point for growth cycles since the measures of aggregate economic activity (which are all presumably reflected in the growth cycle chronology) fail to turn within a narrow time frame. In the early 1970s the index of industrial production turned a full year before the trough in the coincident composite index was reached. Retail sales turned even earlier than the index of production, while only unemployment—a series which not infrequently lags at growth cycle turns—exhibits a trough near the coincident composite index. We have placed the turn in 1971—the time when most of the components of the composite index turn rather than when the composite index turns.

Despite these difficulties, we may note that the median timing for each of the indicator groups falls within the range we would expect. At six of the seven turns available, the medians lead for the leading

indicators. Medians for the roughly coincident indicators also turn within three months of the selected reference turns in five of seven instances. There is no failure to lag among the lagging indicators in the six cases available.

If we examine the relationship between the median timing for leading and roughly coincident indicators (a total of seven comparisons), there are two cases of perverse timing (1975, 1979). We find that the median for leaders does indeed turn before the median for the roughly coincident indicators, in four cases, but in one case there is identical timing. There are no failures of the median for lagging indicators to turn after the median for leading indicators. Moreover, in the five instances available, the inverted laggings invariably lead the leading indicators by a fairly wide margin. Despite the paucity of data, the two lagging indicators also behave as expected. Because it is clear that the indicators we do have do behave reasonably well the case for developing a larger and better group of lagging indicators for Belgium is strong indeed and we would hope that this can soon be done. Indeed one of the overall byproducts from analyzing an indicator system in other countries is to suggest the usefulness to that country of improving the quantity and quality of the indicators available in cases, as Belgian experience illustrates, where the indicator system seems to work.

Analysis of Table 4-7 reveals that among the sequential relationships just considered we find a success rate of 85 percent if we exclude the five lagging inverted indicators, or 89 percent if we consider all of the sequential relationships that can be compared. If we include the one tie as perverse the percentages fall to 77 percent and 83 percent. Such success rates, based as they are on limited data, encourage continued monitoring of Belgian business cycles. Further development of the indicator system, with particular attention paid to the identification of lagging indicators, however, is clearly necessary for a fuller understanding of this small, though highly industrialized, economy.

THE NETHERLANDS

The authors have been able to acquire quite a number of equivalents to the 1966 U.S. list of reliable indicators in their research on the Netherlands. And while an adequate chronology has been developed, difficulties with the data and indicator performance have led to results that are in certain respects less satisfactory than results obtained

Table 4-8. Leads and Lags at Dutch Growth Cycle Turns, Three Groups of Dutch Indicators, 1950-81.

	Median Lead (-) or Lag (+), in Months, at Dutch Peaks (P) and Troughs (T)														Medians at				
	P		T		P		T		P		T		P		T		P	T	P & T
	7/50	6/52	10/56	5/58	3/61	2/63	11/65	8/67	11/70	8/72	8/74	7/75	9/76	11/77	12/79	P	T	P & T	
3 Lagging Indicators, Inverted ^a	n.c. ^b	n.c.	n.c.	-10	-6	-12	-31	-15	-14	-15	-19	-8	-7	-6	-12	-13	-11	-12	
9 Leading Indicators	+9 ^c	+6	-8	-1	-1	0	+3	-2	-6	-4	-6	-1	+2	+4	-4	-2	-1	-1	
5 Roughly Coincident Indicators	+4 ^c	+2	0	0	0	0	0	+3	0	0	0	0	0	0	-4	0	0	0	
3 Lagging Indicators	n.c.	n.c.	+9	+9	+6	0	0	+8	+3	+3	0	+7	+8	+12	+2 ^c	+3	+8	+6	

Notes:
 a. Median peaks in lagging group are compared with growth cycle troughs, and median troughs are compared with growth cycle peaks.
 b. n.c. = no timing comparison.
 c. Only one indicator turn.
 Source: Appendix Table 4B-8.

for countries already reviewed. Why this should be the case is unclear, but we shall attempt an explanation based on the evidence in Figure 4A-8 and Table 4-8.

We do have an unusually long growth cycle chronology for the Netherlands. If we consider leading indicators, we find that, out of fifteen possible observations, five medians exhibit perverse timing behavior (lags). Of these, three occur at peaks; two at troughs. Clearly, leading indicators behaved badly at the beginning of the period under review, but there has more recently been perverse behavior as well among the leading indicators. If we define "success" as any lead at all, however, the leading indicators performed as expected in two-thirds of the cases examined. Among the roughly coincident indicators, there are only two that must be termed perverse, but again they occur very early and very late in the period under consideration. This gives a success rate of 87 percent for the roughly coincident indicators, which compares well with what has been found earlier in the case of other countries. The large number of exact coincidences in timing for these medians suggests strongly that the same indicators that track growth cycles in other market-oriented economies give reasonably unambiguous results for the Netherlands as well. The record increases our confidence in the growth cycle chronology that we have devised for the Netherlands, and we believe that it is a reasonably appropriate one against which to attempt the development of reliable leading and lagging indicators.

In the case of lagging indicators, of the thirteen growth cycle turns for which a median timing can be calculated ten produce a lag and three show exact coincidences. No breakdown in the performance of lagging indicators appears either at the beginning or the end of the period we are studying, and the exceptions to expected timing occur more or less at random in the middle of the period.

If we next consider the median of the timing comparisons at all the individual turns, the results are very similar to those observed in the behavior of the composite indicators summarized in Chapter 3. Very short leads exist for the leading indicators at both peaks and troughs; adequately long lags at peaks as well as troughs can be observed for the lagging indicators. The overall success rate among the three groups of indicators is 77 percent. This rate approximates the percentages calculated for countries previously discussed, but, as we have said, the Dutch leading indicators do not exhibit very long leads.

We should now consider the sequential performance of the four groups of indicators (including the lagging indicators in inverted

form). The relationship between inverted laggers and leaders reveals no perverse sequences or ties—a perfect success rate. Among leading and roughly coincident indicators, less satisfactory results might be anticipated because of the short leads among the leaders. Out of fifteen possible observations, eight are in the direction we would expect, five are perverse (with the roughly coincident median timing preceding the median timing for the leading indicators), and two are ties. Excluding the ties the success rate is 53 percent. But if we include the ties this rate climbs to 67 percent.

Thirteen comparisons of the timing between roughly coincident and lagging indicators result in ten cases that are in the expected direction, for a success rate of 77 percent. There are three ties (23% of the cases) and no cases of perverse behavior. Thus, if we consider the ties as successful (that is, as not being perverse) the roughly coincident/lagging sequence achieves a 100 percent success rate.

If we ignore the inverted laggers and if the identical timing cases are regarded as perverse, there are twenty-eight sequential observations, and they produce a success rate of 64 percent. If identical timing is not regarded as perverse, the success rate increases to 82 percent. When we include the inverted indicators, we arrive at forty sequential observations, thirty of which behave as expected (not including the cases of identical timing), for a success rate of 75 percent. If ties are not regarded as perverse, the success rate overall rises to 88 percent.

Many researchers tie the fortunes of the Dutch economy to West Germany. Comparison of Table 4-8 to Table 4-4 suggests that, despite some degree of parity in growth cycle chronologies between the two countries, very few similarities in the lapses from the expected sequence exist among the indicator groups. There are, of course, differences in the essential organization of the two economies, and it is probably fair to say that the West German economy is considerably more market-oriented than the Dutch. Whether divergence from full reliance on the market affects the potential usefulness of an indicator system is one of the questions that in a sense underlies the whole of this book. While there are considerable differences among the ten countries under review, all appear to be sufficiently "market-oriented" to fall well within the Mitchellian rubric of "nations that organize their work mainly in business enterprises." Hence, degree of market orientation does not appear to be a promising avenue to explore in accounting for the instances of "failure" in the indicator system for the Netherlands. We have seen that the success rate is well within the range found for other economies and that the essential

integrity of the indicator approach is supported once again with the Dutch data under review. The Dutch success rate also suggests that the next stage in our work—improving the performance of the indicator system in each country by developing indicators especially sensitive to growth fluctuations—is especially important in the case of the Netherlands. This is particularly true for the leading indicators, which do not in general present leads long enough to be very useful in economic forecasting. While there is much to be said for an international indicator system based on a common set of business indexes, there is also much to be said for tailoring this effort, when necessary, on a country-by-country basis in order to produce the most sensitive indicator systems possible.

SWEDEN

Sweden further tests the application first questioned in connection with our discussion of the Netherlands, of the term “market-oriented” as an ingredient essential to the Mitchellian analysis of international economic indicators.

A total of seventeen series in Sweden were regarded as roughly equivalent (in deflated form) to the twenty-six series derived from the U.S. 1966 list of reliable indicators, which served as our basis for collecting data. One of the Swedish leaders, though, housing starts, an industry highly regulated by the national authorities, proved to have no discernible growth cycle turning points and so could not be matched with a growth cycle chronology. While the Swedish government in recent years has swung away from central planning and moved again toward a market-orientation, it is nonetheless interesting to consider how an indicator system derived from the Burns-Mitchell methodology (and duplicating as closely as possible the indicators found reliable in the United States) will behave in a country that has, during the post-World War II period, pursued “the middle way.”

Figure 4A-9 illustrates the behavior of the leading, roughly coincident, and lagging indicators for Sweden at each of the six growth cycle turns we have identified. A summary of this behavior appears in Table 4-9, which describes the median timing for the three basic groups of indicators, as well as for the laggings in inverted form, at each of the three peaks and troughs in the Swedish chronology.¹⁴

Table 4-9 suggests that the Swedish data reveal a success rate of 78 percent. If we ignore the inverted lagging indicators, the median for all the indicators classified into the three basic timing groups

Table 4-9. Leads and Lags at Swedish Growth Cycle Turns, Three Groups of Swedish Indicators, 1965-81.

	<i>Median Lead (-) or Lag (+), in Months, at Swedish Growth Cycle Peaks (P) and Troughs (T)</i>						<i>Medians at</i>		
	<i>P</i>	<i>T</i>	<i>P</i>	<i>T</i>	<i>P</i>	<i>T</i>	<i>P</i>	<i>T</i>	<i>P & T</i>
	<i>2/65</i>	<i>7/67</i>	<i>7/70</i>	<i>7/72</i>	<i>6/74</i>	<i>7/78</i>			
4 Lagging Indicators, Inverted ^a	n.m. ^b	-19	-22	-24	-13	-48	-18	-24	-22
7 Leading Indicators	-3	+7	-3	0	+4	-7	-3	0	-2
6 Roughly Coincident Indicators	0	0	0	-1	+5	-2	0	-1	0
4 Lagging Indicators	+10	+10	0	+10	+1	+6	+1	+10	+8

Notes:

a. Median peaks in lagging group are compared with growth cycle troughs, and median troughs are compared with growth cycle peaks.

b. n.m. = no matching turn.

Source: Appendix Table 4B-9.

falls in the expected category fourteen out of eighteen times. The median for the leaders produces two lags—one of four months at the 1974 peak, and one of seven months at the 1967 trough. Among the coincident indicators, a five-month median lag occurs at the 1974 peak. Laggings lag except at the 1970 peak. If we include the inverted laggings, a total of twenty-two observations results, and because inverted laggings consistently lead as expected, the total success rate rises to 19 out of 23 possible cases, or 83 percent of the time. This rate is well within the limits of cases reviewed earlier. It is, in fact, as good, and possibly a bit better, than the behavior of the composite indexes covered in Chapter 3.

Turning our attention to the question of whether or not expected sequences are discernible among the various medians for the indicator groups, we find once again that the results line up reasonably close to those in other countries. If we confine our attention to the three major timing classifications, we observe twelve sequences among the medians for the Swedish indicators. Of these, there are four instances of perverse timing, excluding one instance of identical timing—a “success rate” of 67 percent. If identical timing is regarded

as perverse, the rate drops to 58 percent. Perverse timings occur between the leading and coincident indicators at the 1967 trough and the 1972 trough and the 1974 peak, as well as between coincident and lagging indicators at the 1974 peak.¹⁵ (Timing is identical at the 1970 peak.)

We can, as before, improve the performance of the system overall by including the inverted lagging indicators. The overall success rate for the Swedish indicator system can thus be raised to 71 percent if identical timing is regarded as perverse, and to 76 percent if it is not. The lagging indicators in inverted form produce five observations, and in all these cases the inverted lagging index turns before the leading index, although there are two instances in which there is no match.

The success rate for Sweden is, therefore, quite similar to that for the Netherlands, but once again we find that, with few exceptions, the median leads for leading indicators are disappointingly short. Lagging indicators show reasonably long lags. We can conclude then, that while the Swedish record corroborates yet again the overall feasibility of the cyclical approach, search for more sensitive indicators should be undertaken to enhance our understanding of this country's market forces.

JAPAN

We saw in Chapter 3 that U.S. and Canadian growth cycle chronologies are closely related. The Japanese economic record, while broadly comparable to North America, appears to be a bit closer to the European economies, if not in timing, then in the number of growth cycles experienced in the period since the early 1950s. During the past thirty years Japan, like West Germany, experienced six growth cycles. Canada and the United States, for a roughly comparable period, experienced eight. Japan's rapid growth during the 1950s and 1960s precluded cyclical declines in aggregate economic activity, yet the indicator behavior expected from the evidence of classical cycles in the United States was substantially reproduced in Japanese growth cycles.

Table 4-10, summarizes the median timing for indicators at each growth cycle turning point. The findings are essentially the same as those we have come to expect—exceptions, however, occur among the roughly coincident indicators at the 1980 peak, which shows a twelve-month lead. There are no exceptions among the leading indicators, and only one among the lagging indicators (a four-month lead

Table 4-10. Leads and Lags at Japanese Growth Cycle Turns, Three Groups of Japanese Indicators, 1953-81.

	Median Lead (-) or Lag (+), in Months, at Japanese Growth Cycle Peaks (P) and Troughs (T)																	
	Medians at																	P & T
	P	T	P	T	P	T	P	T	P	T	P	T	P	T	P	T	P	
6 Lagging Indicators, Inverted ^a	12/53	6/55	5/57	1/59	1/62	1/63	7/64	2/66	6/70	1/72	11/73	3/75	2/80	P	T	P	T	
	n.c. ^b	n.c.	-12	-8	-21	-6	-14	-15	-34	-5	-15	-7	-51	-18	-7	-14	-14	
10 Leading Indicators	-1	-9	-4	-4	-6	-6	-10	-6	-5	-1	-6	-2	-14	-6	-4	-4	-4	
6 Roughly Coincident Indicators	-2	0	0	0	-2	0	-2	+1	0	0	0	0	-12	-2	0	0	0	
6 Lagging Indicators	n.c.	+11	+12	+15	+6	+5	+4	+9	+3	+8	+8	+8	-4	+5	+8	+8	+8	

Notes:

a. Median peaks in lagging group are compared with growth cycle troughs, and median troughs are compared with growth cycle peaks.

b. n.c. = no timing comparison.

Source: Appendix Table 4B-10.

of the 1980 peak). This represents a success rate of 95 percent. If we include the inverted lagging indicators, appropriate behavior among Japanese indicators occurs in 96 percent of the observations.

If we examine whether the groups of indicators turn in the expected sequence regardless of the absolute timing, we find that the Japanese record is almost as impressive. The median for leading indicators occurs earlier than the median for roughly coincident indicators at all turns, with the exception of the very first peak in 1953 (when leaders turned one month after roughly coincident indicators). Relationships between the roughly coincident indicators and the lagging indicators performed as expected in every instance, except the 1980 peak when the coincident group turned eight months after the lagging group. Thus, the success rate among the three major indicator groups is 92 percent. If we include the inverted lagging indicators, we encounter the expected timing at all turns, with the exception of the 1963 trough when the inverted lagging and leading indicators have identical median timing. For all four indicator groups the success rate is 94 percent (or 92% if we count ties among the perverse timing observations).

SUMMARY AND CONCLUSIONS

Having summarized the timing behavior of leading, roughly coincident, and lagging indicators at growth cycle turning points for ten different countries, the evidence of aggregate economic activity appears to strongly support the fundamental hypothesis of this book—namely, that the Burns-Mitchell approach to cyclical analysis can be adapted to monitor growth cycles not only in the United States, but in other market-oriented economies as well.

We will now concentrate on the median timing of each group of indicators at growth cycle peaks or troughs in the countries under study. Does the median for each group of indicators at each turn, in fact, conform to the timing classification rules for indicators? How consistently do leading indicators lead, lagging indicators lag, and roughly coincident indicators turn within the prescribed three months of each growth cycle turn? To what extent does the median timing for all indicator groups adhere to the expected sequence? To answer this third question, we considered all the possible sequential observations available, including or excluding the sequences involving the inverted laggards vis-à-vis the leaders (on the grounds that inverted laggards lead by so long that it is truly rare for the median timing of turns in that group not to precede the leaders), and paid particular attention to cases where the median timing in two groups of indi-

cators was identical. These "ties," if regarded as examples of "perverse timing," can be excluded from the "successful sequences." We thus reduce the definition of success in the sequential patterns to the minimum.

The timing sequences considered in the previous tables of this chapter are summarized in Table 4-11. If we include the inverted ladders, the table suggests that overall the expected sequence occurred 88 percent of the time in the nine foreign countries. This compares to 82 percent for the United States. If we exclude the inverted ladders and consider simply the sequences for leading, roughly coincident, and lagging indicators, the expected sequences occurred at turns in 83 percent of the cases outside the United States, compared to 87 percent for the U.S. data.

This suggests that there are countries outside the United States—where the technique for the classification of indicators originated, where the system actually behaves better than in the United States along with cases where the contrary is the case. It should, of course, be borne in mind that the results just given are based on the behavior of median timing patterns, and there are a far larger number of exceptions in the behavior of individual indicators at individual turns.¹⁶ But that kind of a test would also reveal a large number of exceptions if we considered the behavior of individual indicators at classical cycles.¹⁷

Moreover, the figures in this chapter form an indispensable part of the total picture because they do indeed show the behavior of each individual indicator on a turn by turn basis. The general conformity to the growth cycle chronology postulated, as well as the exceptions, is visibly displayed there for the interested reader.

Having commented on the overall success with which the indicators we have collected perform, we ought, nonetheless, to pause to consider why the indicator system performs notably better in some countries than in others. One observation is certainly in order. In general, the indicator system often performs less well in the initial periods for which data in foreign countries became available. Time after time exceptions, both in the median timing for a group of indicators and in the sequential behavior, was poorer at the first turn or two than subsequently. Whether this can be explained entirely on grounds that the data are of lesser quality is uncertain. Certain countries have undeniably undergone important economic changes, i.e., they have become more or less "market-oriented." In any case it is doubtful whether the successfulness of the indicator system can be correlated with the degree of market-dominance with any precision. Certainly, the indicator system appears to work somewhat more con-

Table 4-11. Summary, Percent "Success" Rate in Median Timing of Growth Cycle Indicators, for Ten Countries.

Country	Number of Observed Sequences ^a		Percent Expected Sequences		Number of Observed Sequences Excluding Inverted Laggors		Percent Expected Sequences	
	All Sequences	Excluding "Ties"	All Sequences	Excluding "Ties"	All Sequences	Excluding "Ties" ^b	All Sequences	Excluding "Ties" ^b
United States	56	93	89	93	38	87	92	92
Canada	55	89	85	89	35	84	79	79
United Kingdom	37	97	94	97	25	92	96	96
West Germany	25	92	84	92	18	78	89	89
France	21	86	86	86	16	81	81	81
Italy	23	91	83	91	17	83	91	91
Belgium	18	89	83	89	13	77	85	85
Sweden	17	88	75	88	12	58	75	75
Netherlands	40	76	71	76	28	64	82	82
Japan	36	94	92	94	25	88	92	92
Mean (Excluding U.S.)	30	89	84	89	21	78	77	77
Median (Excluding U.S.)	25	89	85	89	18	78	85	85

Notes:

a. Including inverted laggors.

b. Cases where two groups of indicators show identical median timing are "ties." In this column they are treated as consistent with the "expected" sequence.

sistently for some of the larger countries than is the case in some of the smaller economies, although why the results for the Netherlands, for example, where it works relatively poorly, should be so disparate to the results for Belgium, where it works relatively well, is not at all clear. Overall, the results were least encouraging in the case of Sweden and the Netherlands, but on the other hand the performance appears better than in the United States, in the United Kingdom, Belgium, and perhaps, Japan.

One other finding is perplexing. The number of exceptions was somewhat greater not only at the beginning, but also, in the case of a number of countries, during the most recent few growth cycle turns. This tendency, though not pronounced, is noticeable. Even in the United States the success rate was higher prior to the last few growth cycle turns. We have, of course, already commented on the necessity for constant review of indicator performance with the object of updating and revising the short lists of "most reliable indicators" on which for the sake of efficiency many countries now rely. The comments made here underscore the importance of this while we remind the reader of our earlier finding that indicators for the United States historically have only rarely exhibited any fundamental change in their timing characteristics. Certainly, they have only rarely been reclassified from one group to another.

There are other anomalies. Again with respect to the Dutch performance, it is interesting to note that the success rate is in the same general range as is that of West Germany which (among the major countries) has a somewhat lower success rate than the other countries. The Dutch often comment on the degree to which cyclical developments in their country follow those in West Germany. We have begun to explore indicators related directly to foreign trade in an effort to test the usefulness of the indicator system in forecasting these international developments. (See Chapter 7 for a preliminary discussion of these possibilities.) What remains to be done is to consider whether there may be countries in which the domestic operation of an indicator system can be systematically changed by the influences from outside. That is, could the interrelationships mirrored in the indicator system be systematically affected in enterprise economies heavily dependent on developments in another economy? The answer is not clear, but the possibility is certainly real that the performance of indicators which otherwise lead or lag with some degree of consistency in countries that are both enterprise-oriented and largely self-sufficient could be significantly affected in a country with a large dependence on an outside economy. Such a possibility might explain the performance of the Dutch indicators,

but the question of why German performance is poorer than that of the United Kingdom, Italy, Canada, or Japan, remains largely open. A systematic and continuing reevaluation of the performance of the indicators in each country is always in order, perhaps employing some variant of the scoring systems used in recent years for U.S. indicators.¹⁸

NOTES TO CHAPTER 4

1. Cf. A. F. Burns and W. C. Mitchell, *Measuring Business Cycles* (New York: NBER, 1946), p. 3.

2. Before examining the figures in the appendixes the reader should be reminded of the notation used. Asterisks denote turning points selected by the computer or by judgmental analysis. Circled asterisks identify turns selected by the computer but rejected in judgmental analysis. Asterisks inside a square identify turning points added by judgmental analysis. In this way divergences from the computer-selected turns, based on a codification of the basic "rules" for turning point selection, can be easily seen.

3. The current growth cycle chronology represents a more up-to-date version of the chronology developed by Mintz, "Dating United States Growth Cycles," *Explorations in Economic Research* 1, no. 1 (Summer 1974). For 1948-1969, ten out of the fifteen turning points in Mintz's U.S. chronology are the same in the present chronology. Some of the differences are the result of our use of the Bry-Boschan technique; Mintz measured long-term trend directly as a centered, seventy-five-month moving average. These differences, however, are relatively minor.

4. This was found to be the case in the 1973-76 "classical" recession. See Geoffrey H. Moore and Philip A. Klein, "New Measures of Recession and Recovery in Seven Nations," *Across the Board* (October 1976). Also, "A New Index for the Summit," *New York Times* (May 1, 1977), Financial Section, p. 18; and "Appraising Recent Economic Recovery in Three Countries," *Economic Outlook USA* (University of Michigan, Survey Research Center) 4, no. 3 (Summer 1977): 38-39.

5. Ise Mintz, "Dating United States Growth Cycles," p. 46.

6. For illustration of this point, examine the coincident composite index for the United States (Figure 3-1).

7. By definition, leading indicators must show a lead of at least one month, the laggards must lag by at least one month, and the roughly coincident indicators must turn within three months of the reference turn. A somewhat more lenient rule would count exact coincidences (zero timing) as "not exceptional" in the leading and lagging indicator groups. In either interpretation, there is some overlapping possible—that is, a one-month lead is not exceptional in the leading indicators or in the roughly coincident category. As a rough measure of conformity to the timing classification, however, the overlapping possibility is not serious. In the following discussion the percentage of exceptions to the rules in each

country are shown by counting zero timing as not exceptional and in parentheses counting zeros as exceptions.

8. This test is more stringent than the previous test for timing because there can be no overlapping in the classification of "success." It is true, however, that examining the sequence of turns in all timing classes permits of "success" even when all groups show leads or lags.

9. See G.H. Moore's *Statistical Indicators of Cyclical Revivals and Recessions* (New York: NBER, Occasional Paper No. 31, 1950), pp. 54-57; and "Generating Leading Indicators from Lagging Indicators," *Western Economic Journal* (June 1969): 137-44. Also Phillip Cagan, "The Influence of Interest Rates on the Duration of Business Cycles," in Jack M. Guttentag and Phillip Cagan, eds., *Essays on Interest Rates*, Vol. 1 (New York: NBER, 1969); and Kathleen H. Moore, "The Comparative Performance of Economic Indicators in the United States, Canada, and Japan," *Western Economic Journal* (December 1971): 419-28.

10. Concerning the record of leading indicators derived from the analysis of classical cycles, Mintz "Dating United States Growth Cycles," pp. 69-72, pointed out that in some ways their performance is even better at U.S. growth cycle turning points. One of the objections raised over the performance of leading indicators during classical cycles is that they sometimes give "false signals"—that is, they indicate a classical turn that in fact fails to materialize. As Mintz points out, however, when the same series is analyzed in growth cycle terms many of these false signals become accurate: a weakening in a series, which does not become severe enough to produce an absolute decline in the level of activity, can nonetheless show up as growth recession. Hence, leading indicators, even though derived from classical cycle analysis, may in fact have a better track record in accurately predicting growth cycle turns. She also found that oftentimes the variability of the lead around growth cycle turning points was reduced.

11. Compare Table 4-3 to Table 6 in Philip A. Klein, "Postwar Growth Cycles in the United Kingdom—An Interim Report," *Explorations in Economic Research* 3, no. 1 (Winter 1976): 103-46.

12. *Ibid.*, p. 129.

13. Ilse Mintz, *Dating Postwar Business Cycles: Methods and their Application to Western Germany, 1950-67* (New York: NBER, Occasional Paper No. 197, 1969), p. 28.

14. For an earlier analysis of Swedish growth cycles, see Philip A. Klein, *Analyzing Growth Cycles in Postwar Sweden*, Economic Research Report Number 44 (Stockholm: Swedish Federation of Employers, Swedish Industrial Publications, August 1981).

15. At this point, the reader is reminded of the earlier discussion (Chapter 3) concerning the spread among coincident indicators at the 1974 turning point, and the consequent difficulty in selecting an appropriate growth cycle turn. The spread among most of the indicators was about a year, although unemployment lagged twenty-nine months.

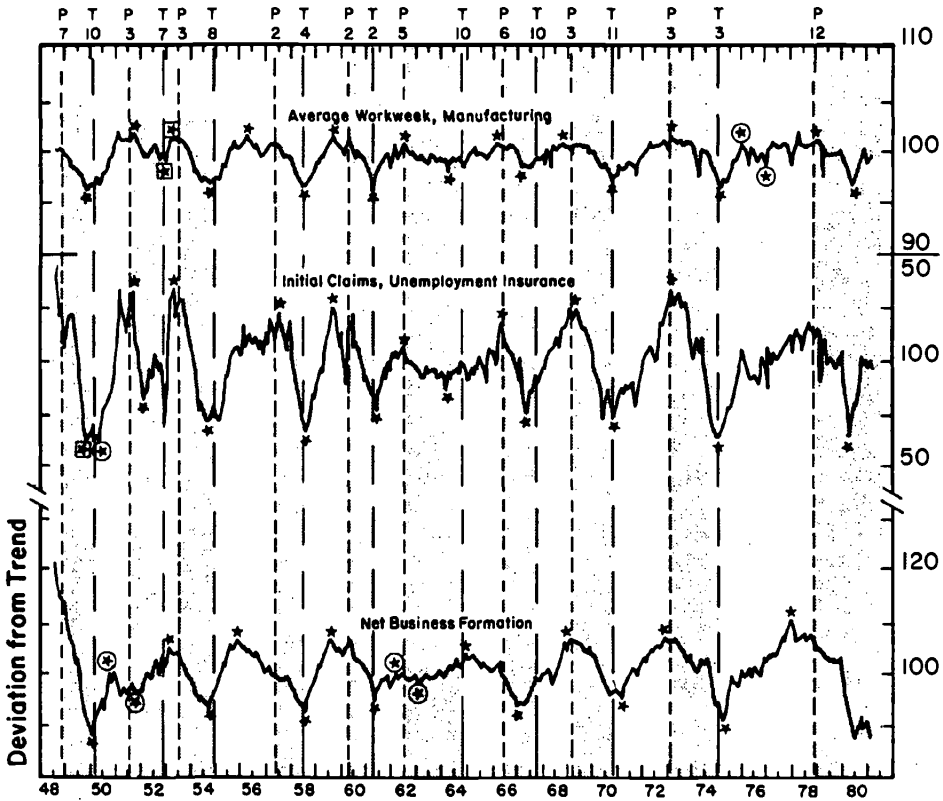
16. The reader may refer to the actual timing of each indicator in each country given in Appendix B.

17. Geoffrey H. Moore and Julius Shiskin devised a scoring system in connection with their 1966 list of indicators—the list, in fact, on which the international work reported here was based. With 100 percent representing perfection, the twelve leading indicators scored between 44 percent and 87 percent with respect to their timing at available classical cycle turning points, or generally lower than the results we have found here for our international growth cycle indicators. The roughly coincident indicators scored between 12 percent and 87 percent, while the lagging indicators scored between 25 percent and 94 percent. The scores refer to our question one, rather than to the sequences referred to in the text. But the evidence is suggestive of the definition of “success” which was reasonable to adhere to in the analysis of U.S. indicators for classical cycle analysis. Geoffrey H. Moore and Julius Shiskin, *Indicators of Business Expansions and Contractions*, National Bureau of Economic Research, 1967, p. 68.

18. In addition to the Moore-Shiskin scoring system already referred to, Zarnowitz and Boschan utilized much the same system in connection with their 1975 revision of the U.S. short list. *Business Conditions Digest* (May and November 1975).

APPENDIX 4A
 FIGURES SHOWING ALL INDICATORS SELECTED FOR
 TEN MARKET-ORIENTED ECONOMIES

Figure 4A-1. United States, Components of Leading Index.



Deviation from Trend

Figure 4A-1. United States (continued)

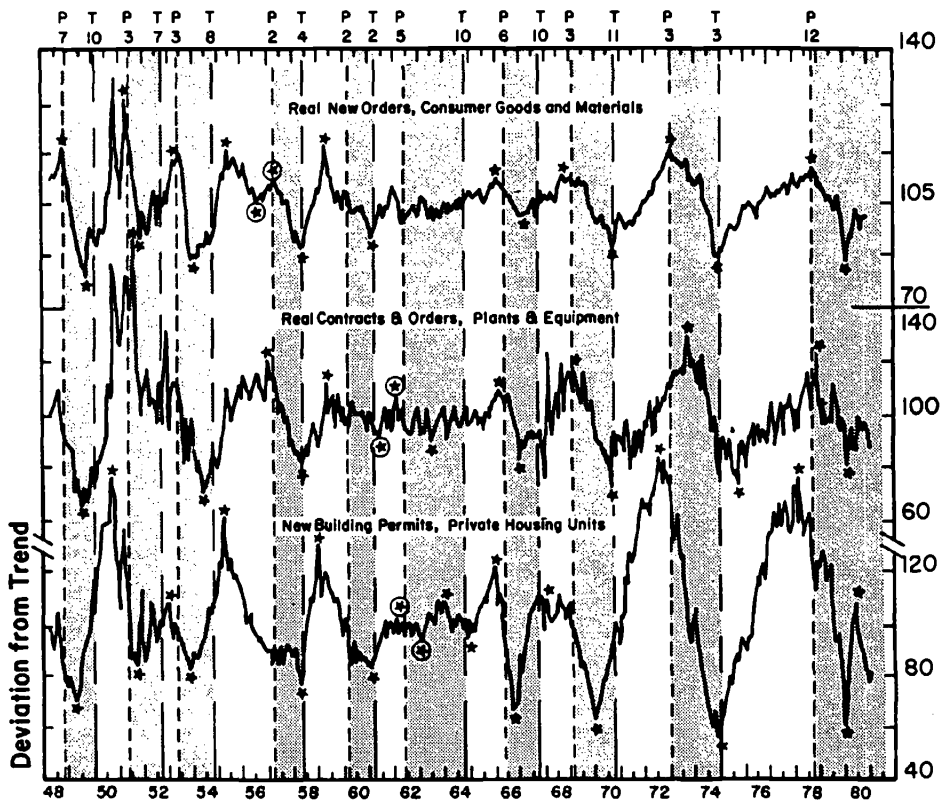


Figure 4A-1. United States (continued)

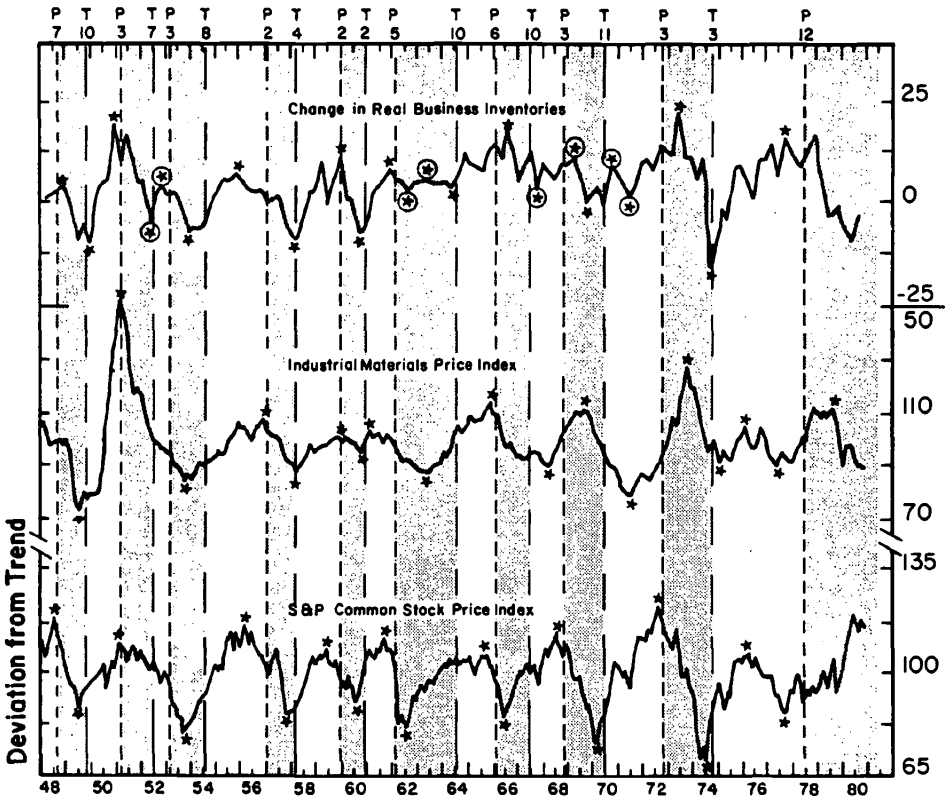


Figure 4A-1. United States (continued)

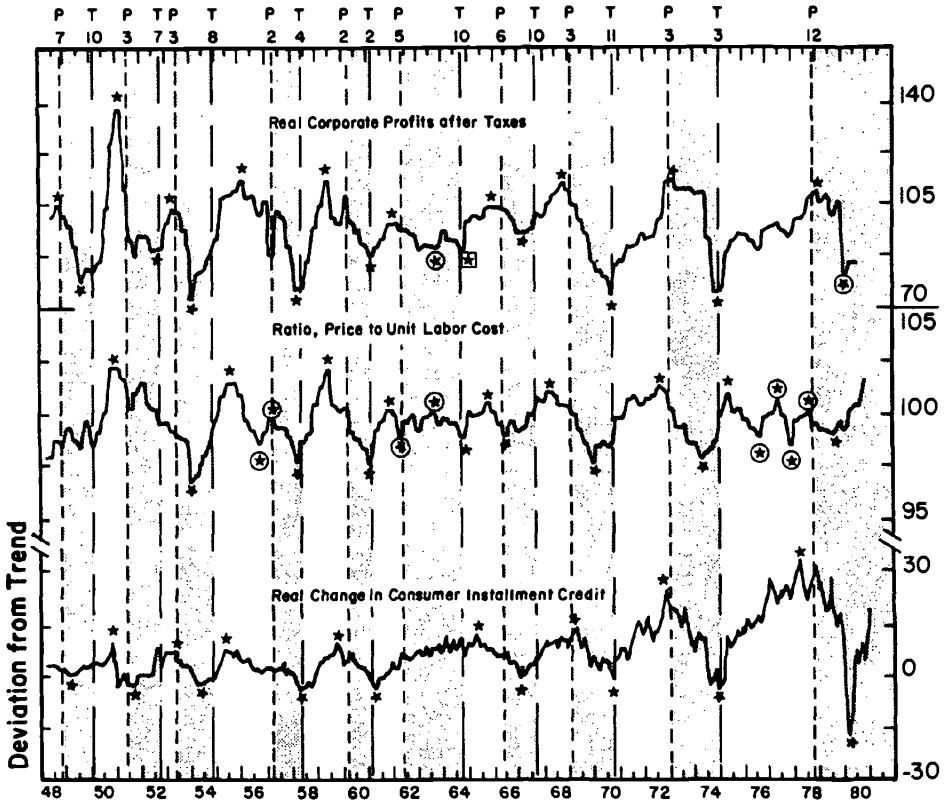


Figure 4A-1. United States (continued)

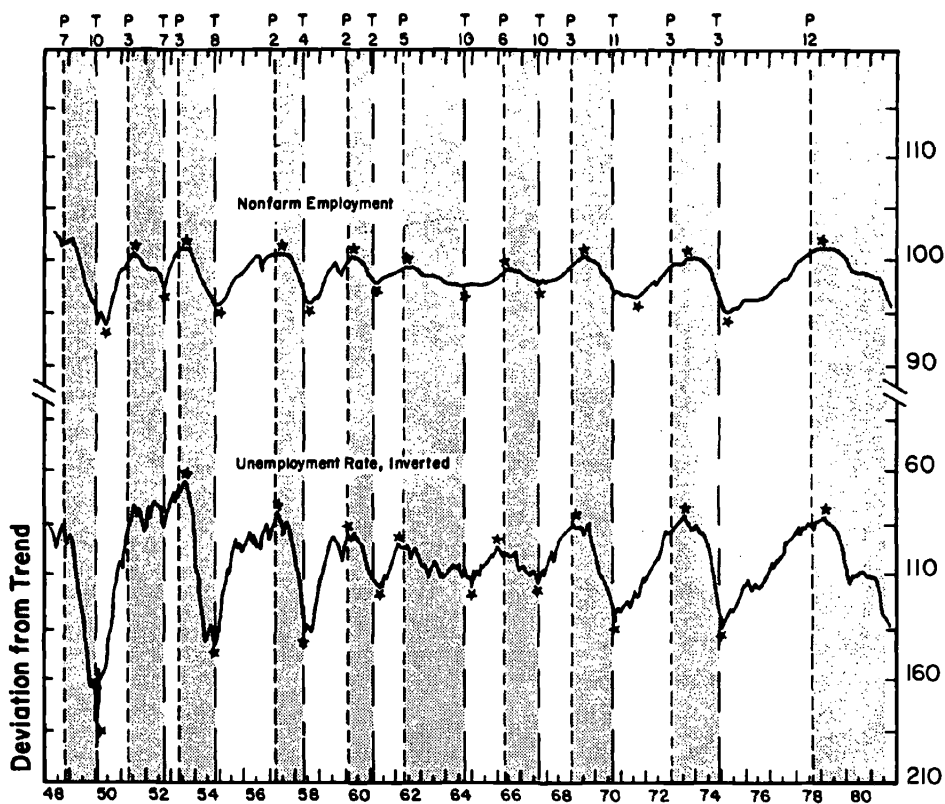


Figure 4A-1. United States (continued)

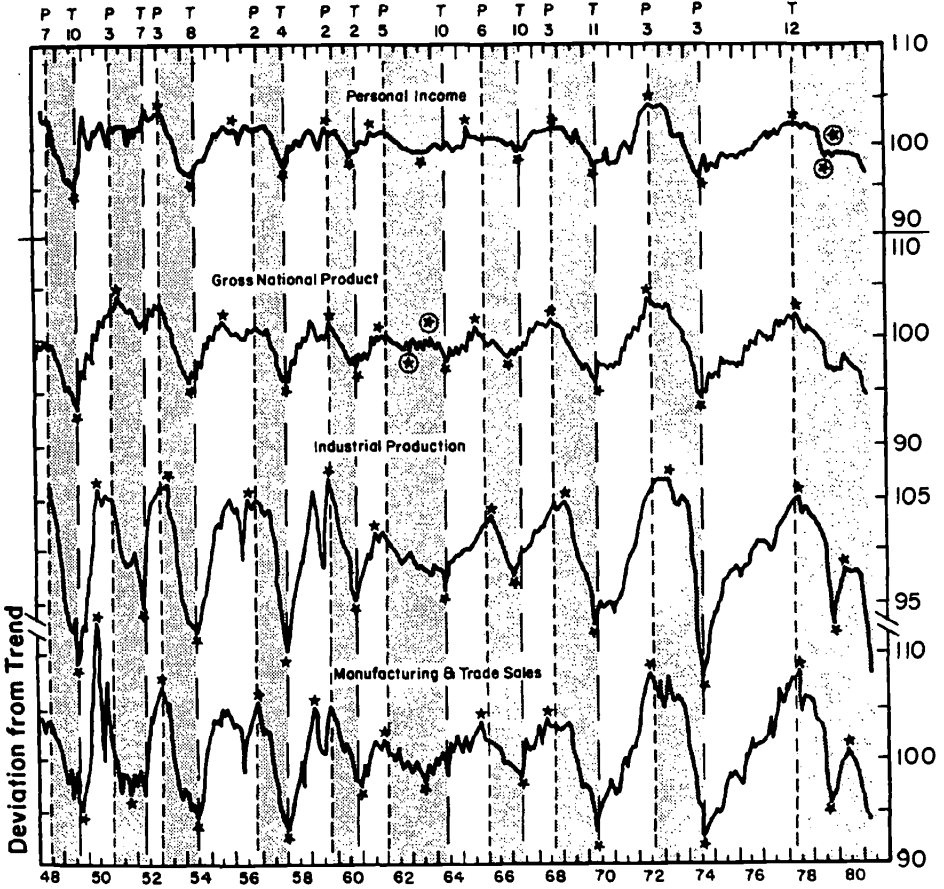
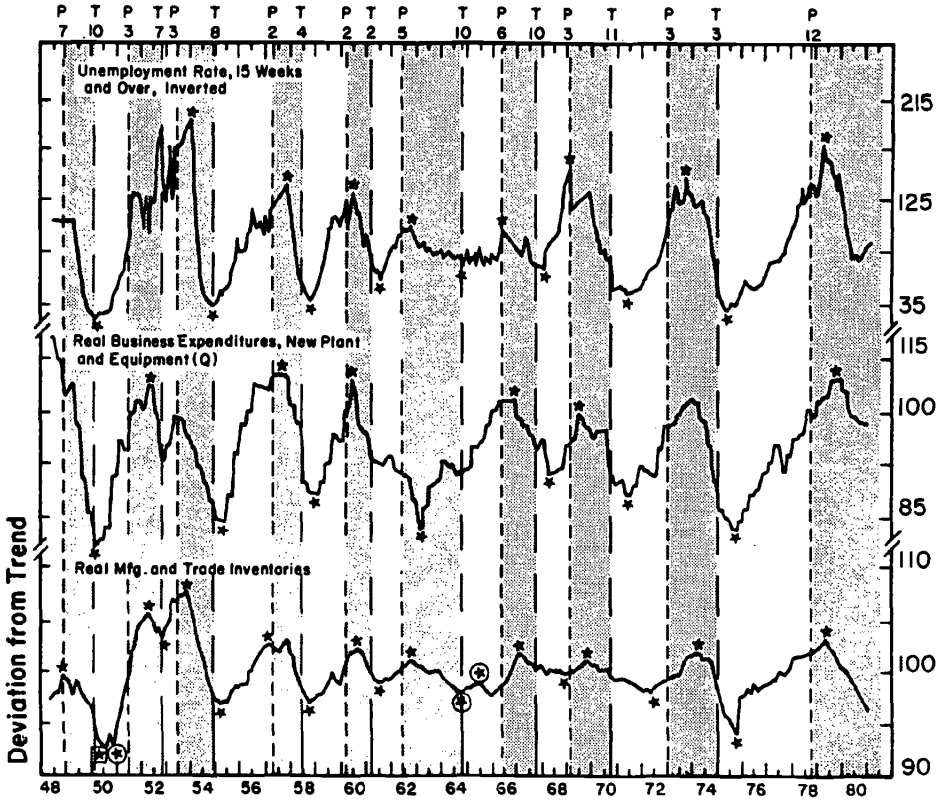


Figure 4A-1. United States (continued)



Deviation from Trend

Figure 4A-1. United States (continued)

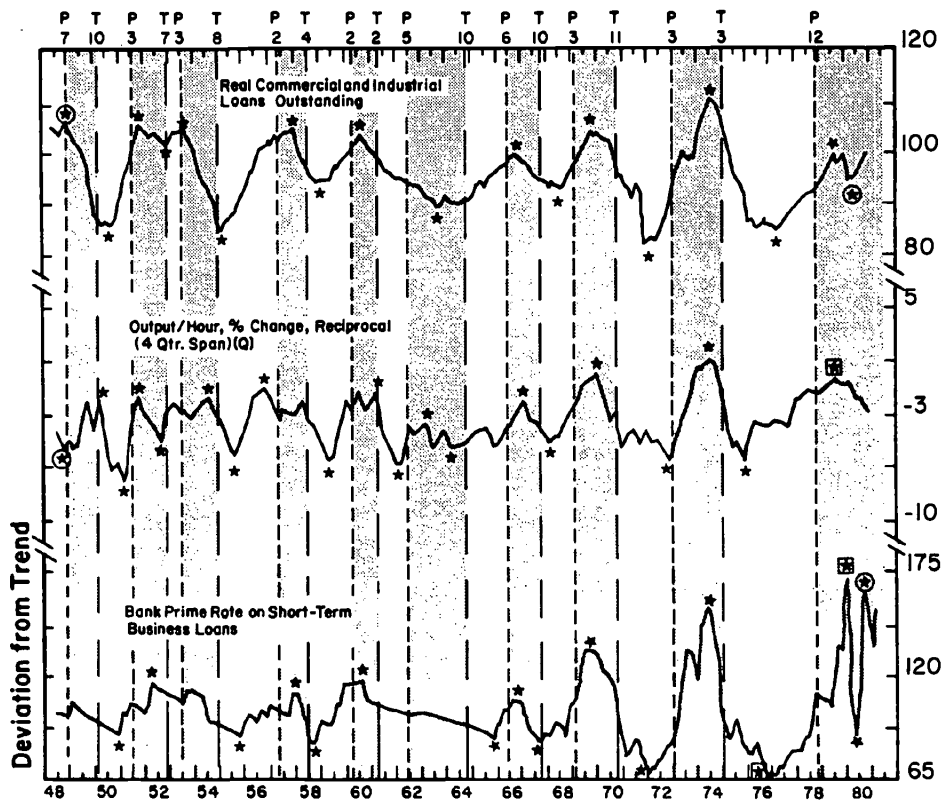


Figure 4A-2. Canada, Components of Leading Index.

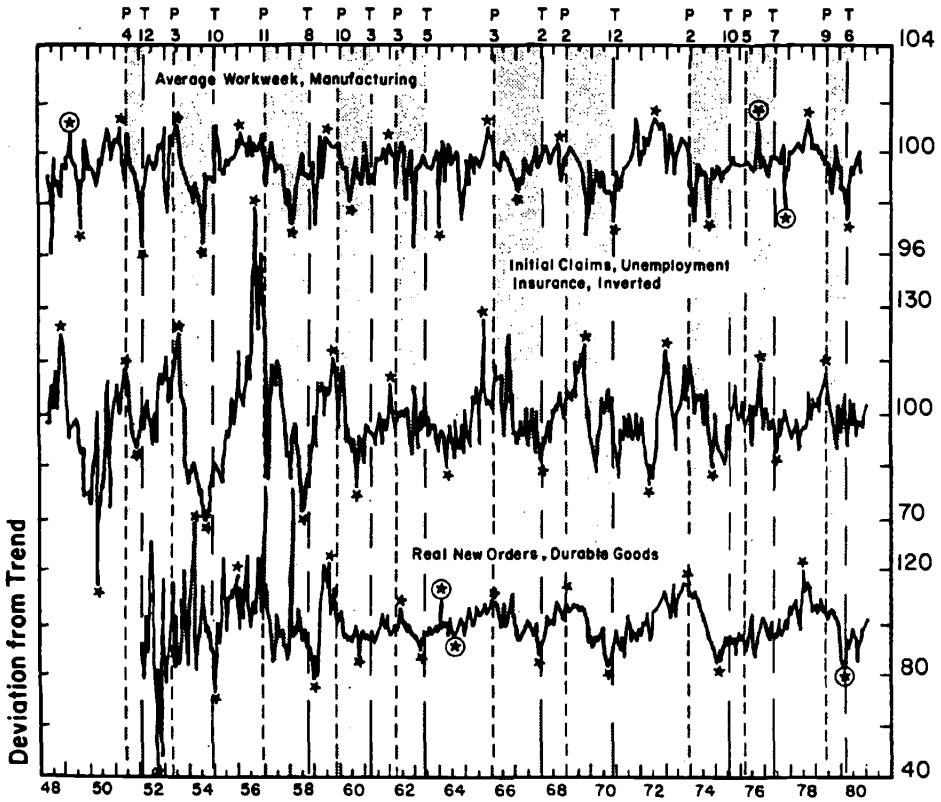


Figure 4A-2. Canada (continued)

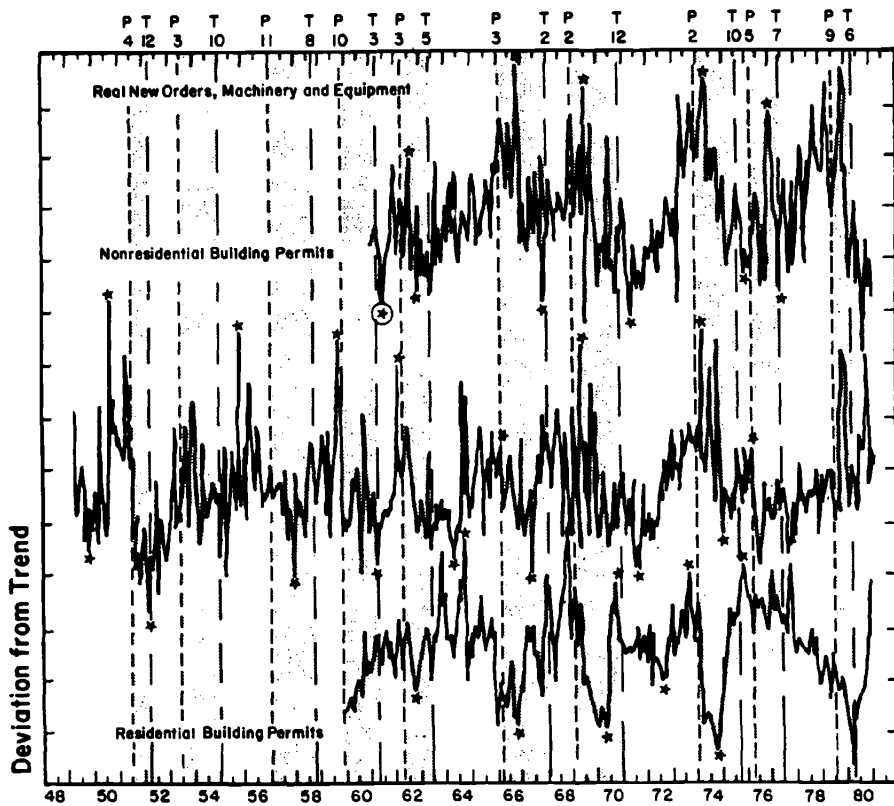
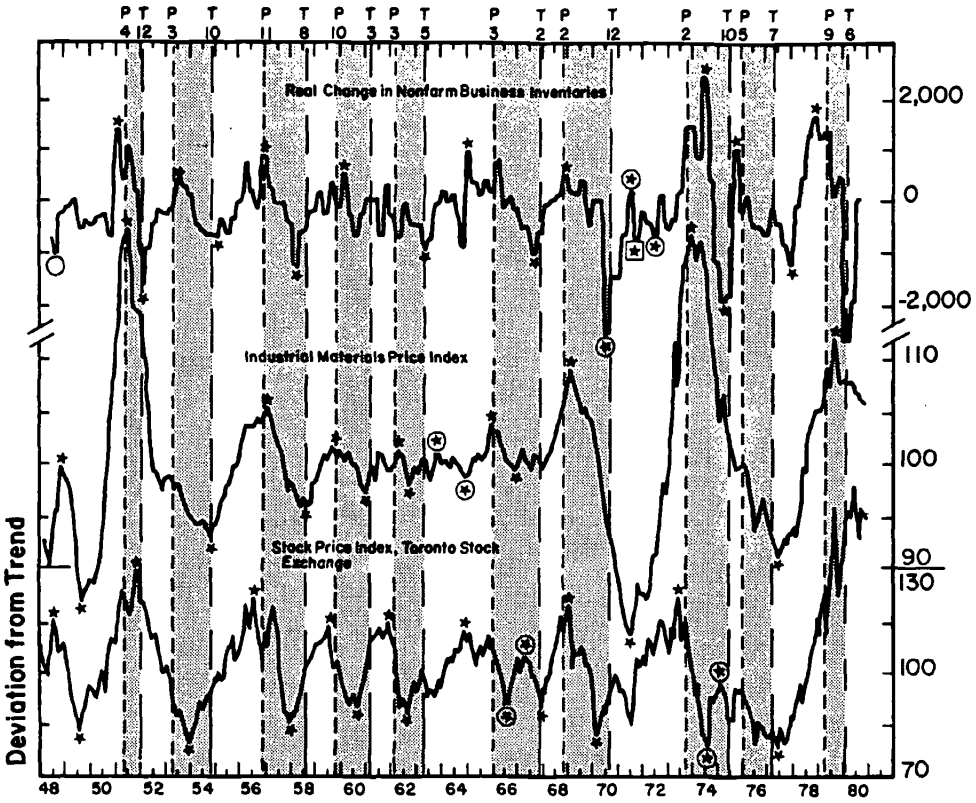


Figure 4A-2. Canada (continued)



Deviation from Trend

Figure 4A-2. Canada (continued)

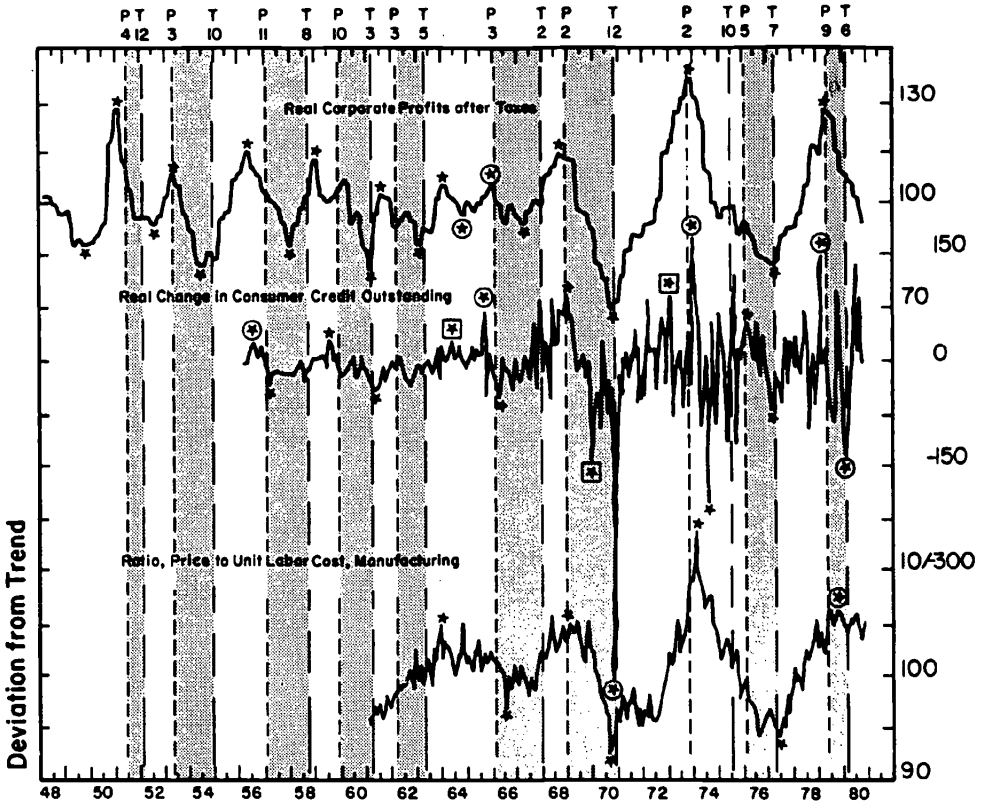


Figure 4A-2. Canada (continued)

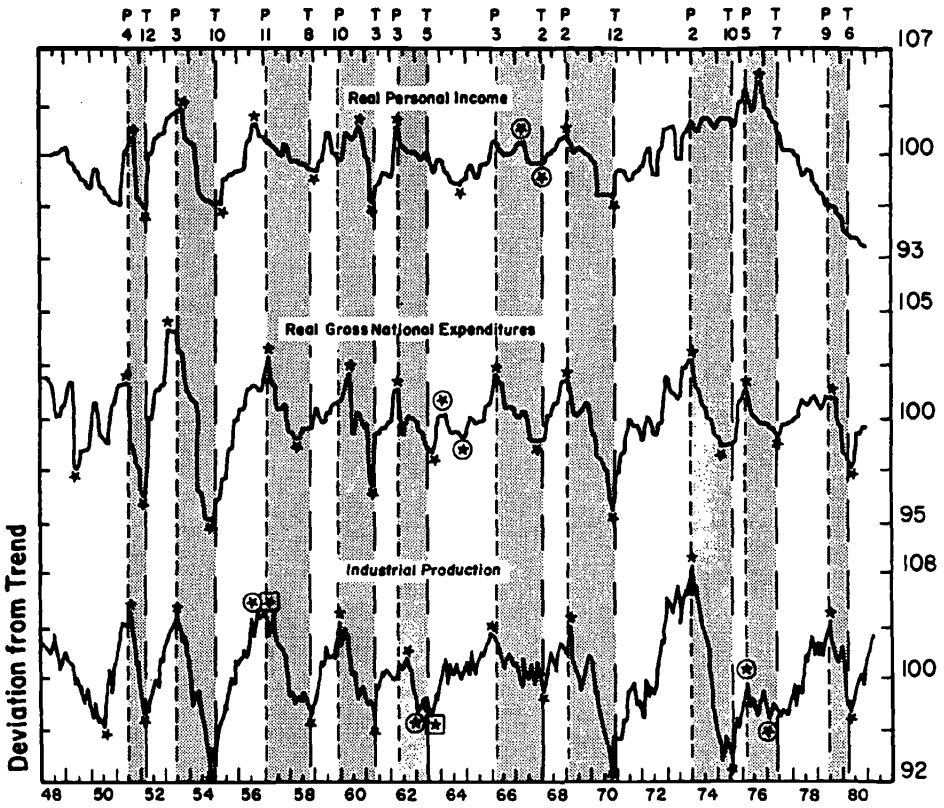


Figure 4A-2. Canada (continued)

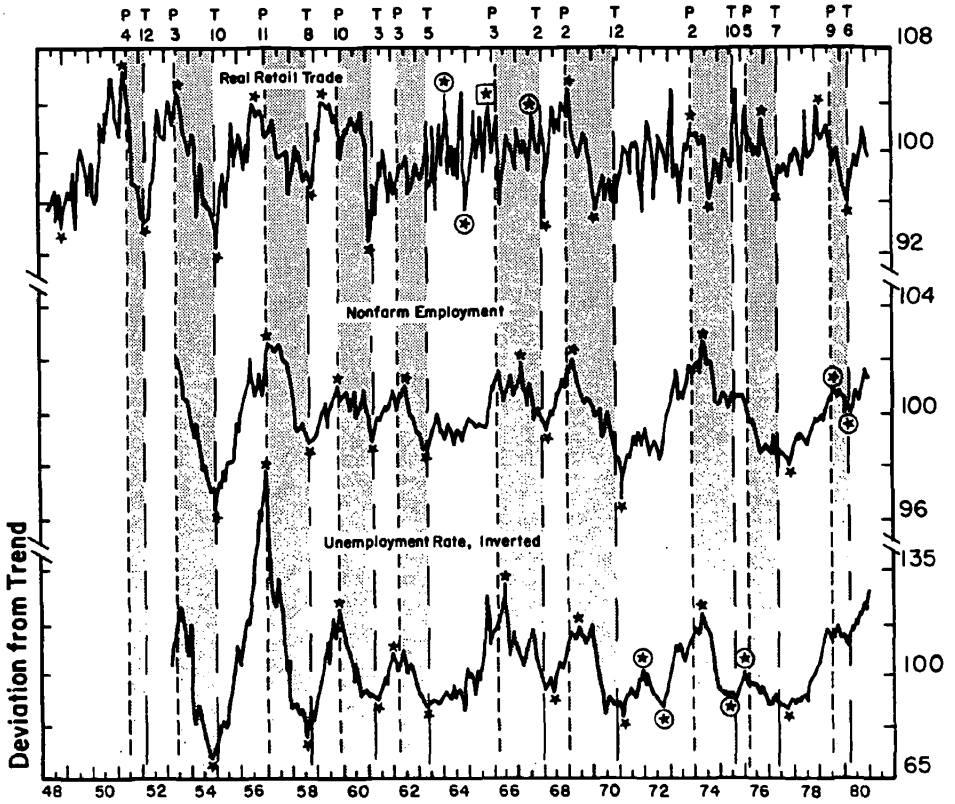


Figure 4A-2. Canada (continued)

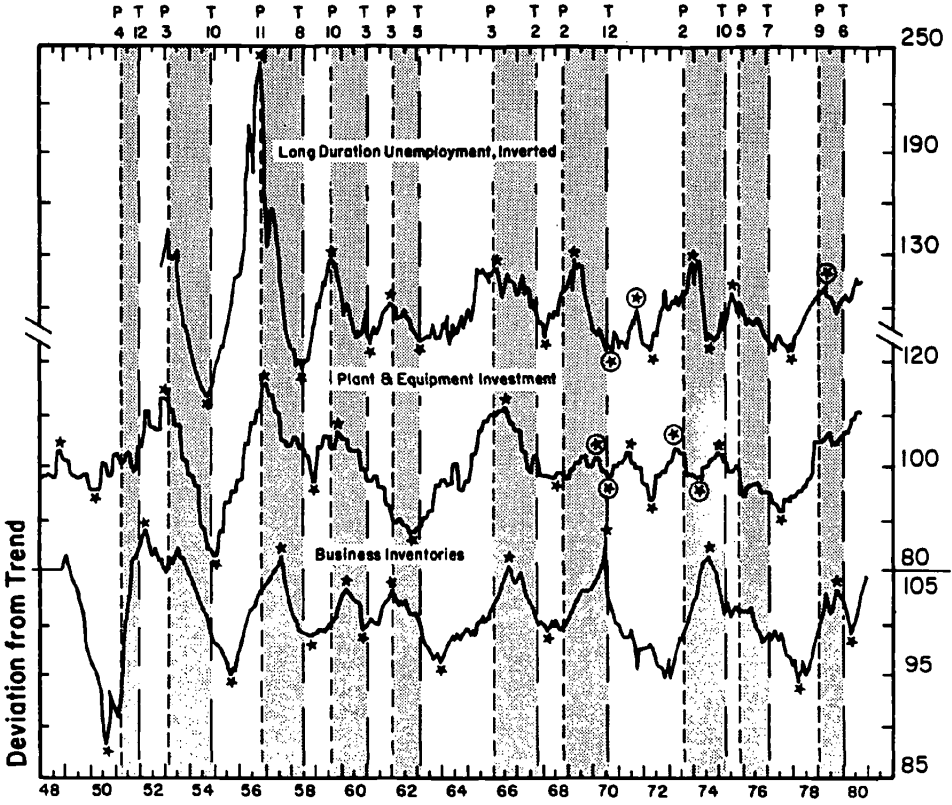


Figure 4A-2. Canada (continued)

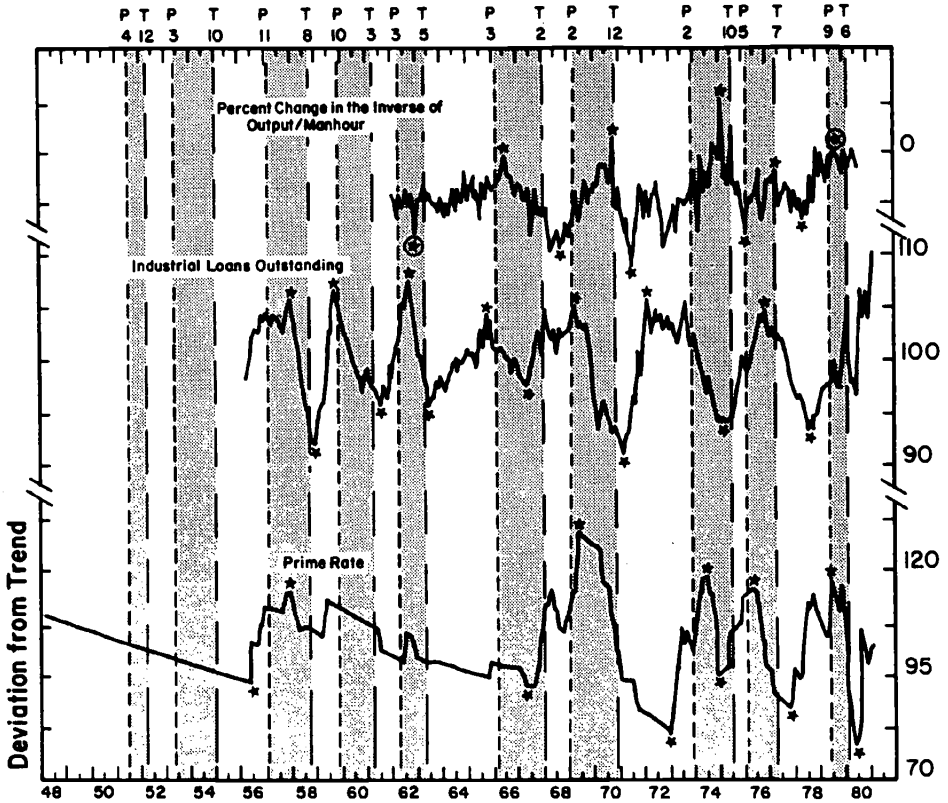


Figure 4A-3. United Kingdom, Components of Leading Composite Index.

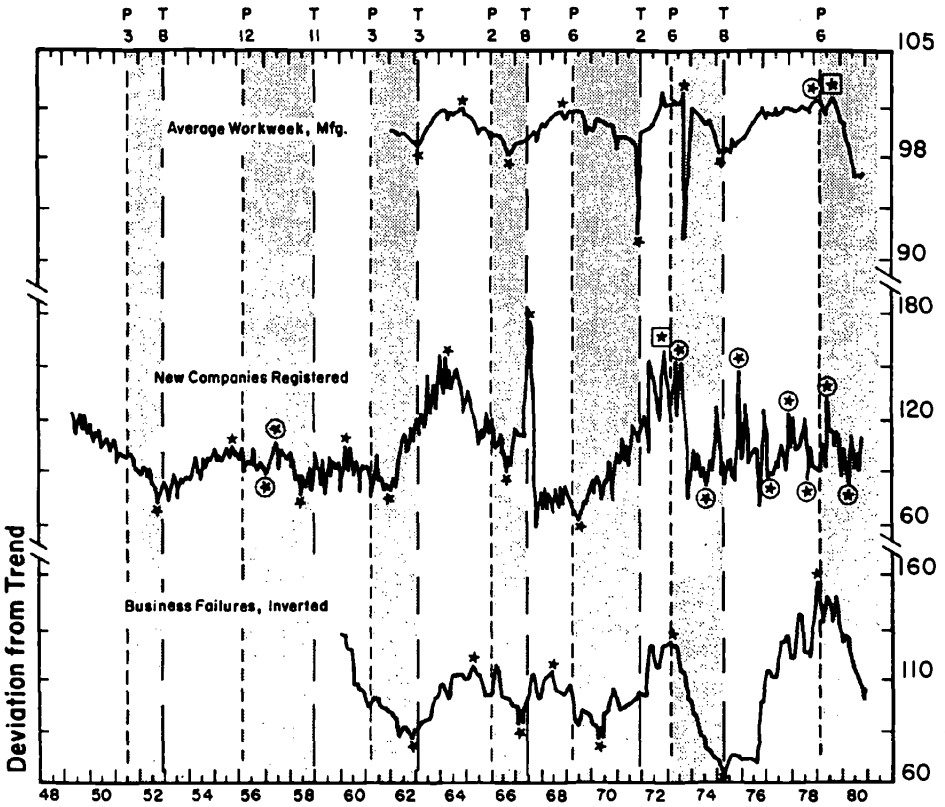


Figure 4A-3. United Kingdom (continued)

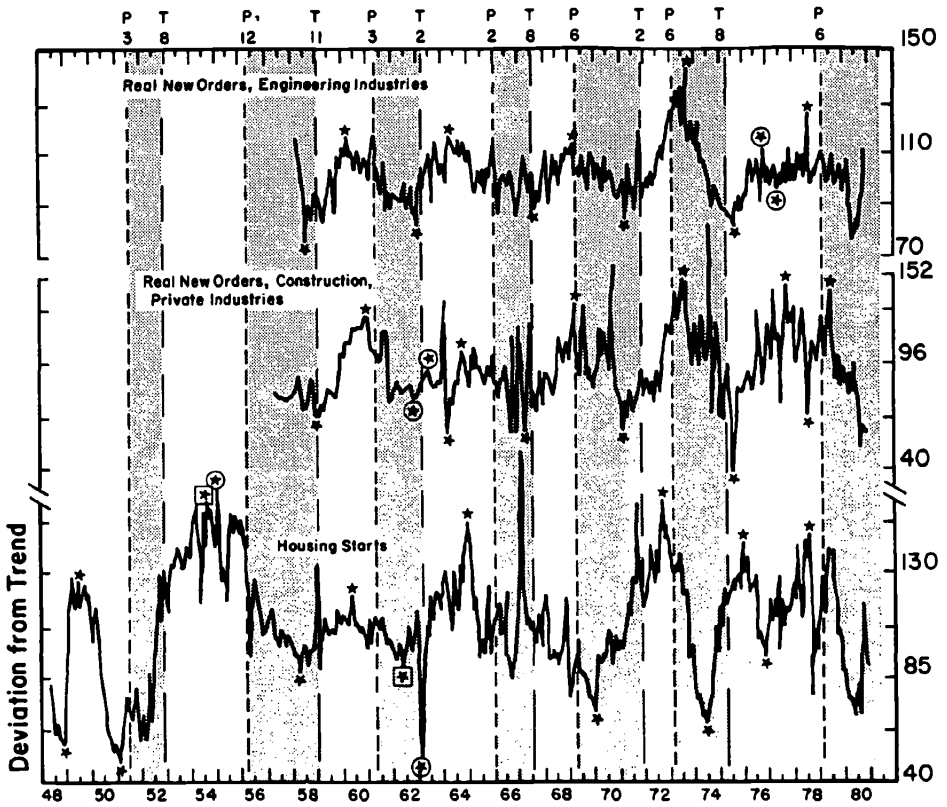


Figure 4A-3. United Kingdom (continued)

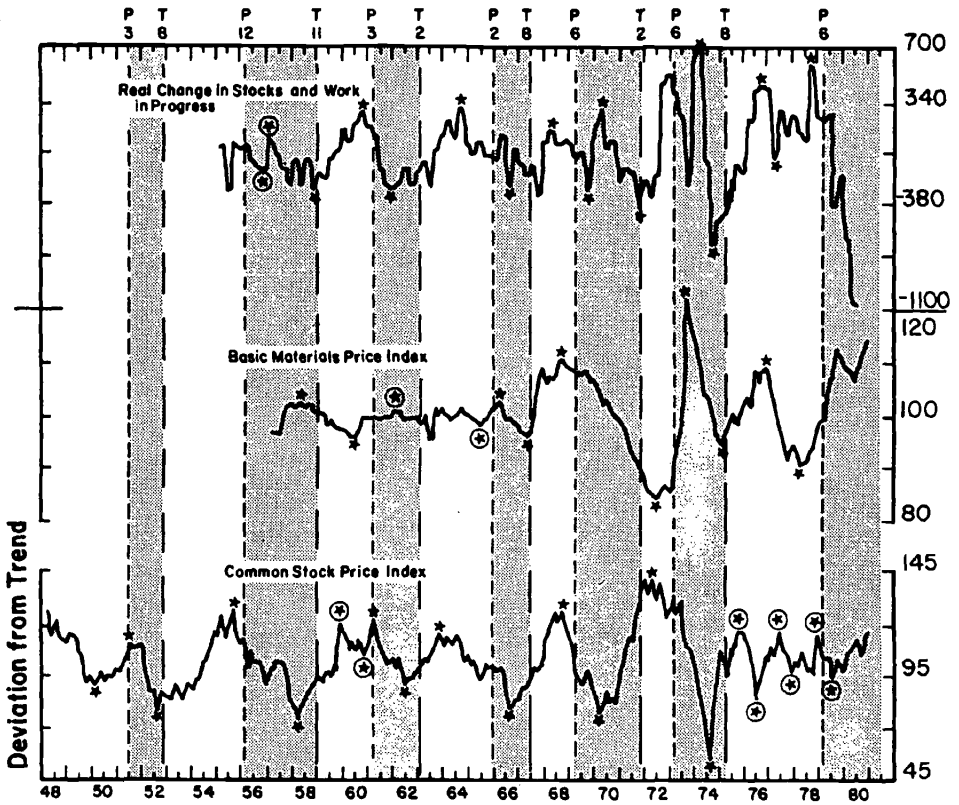


Figure 4A-3. United Kingdom (continued)

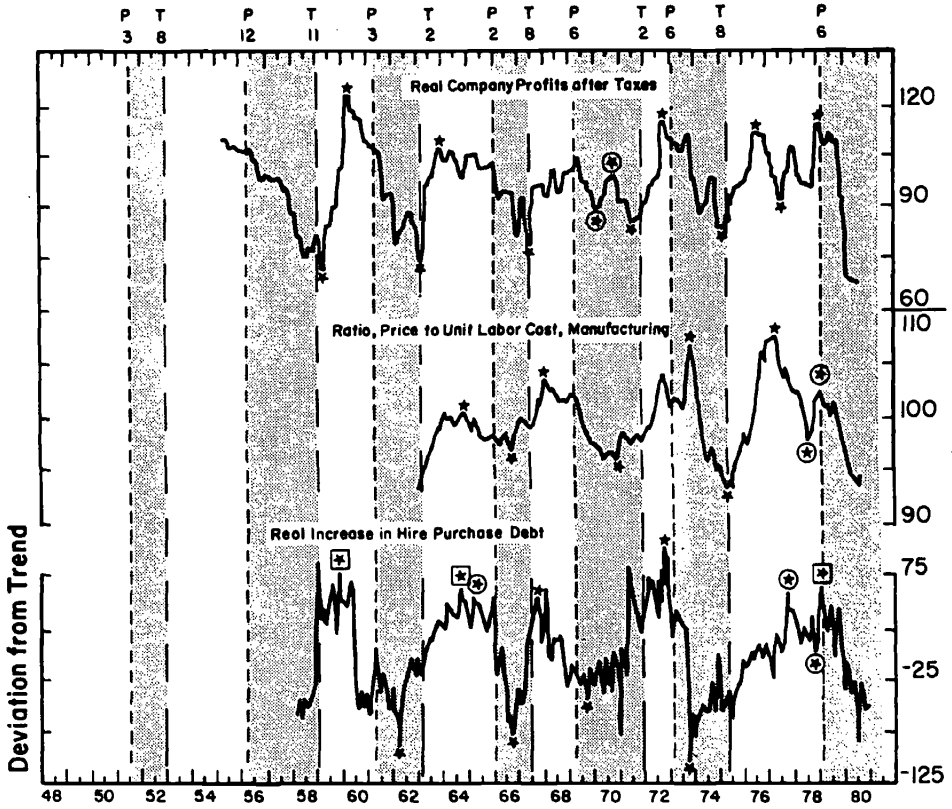


Figure 4A-3. United Kingdom (continued)

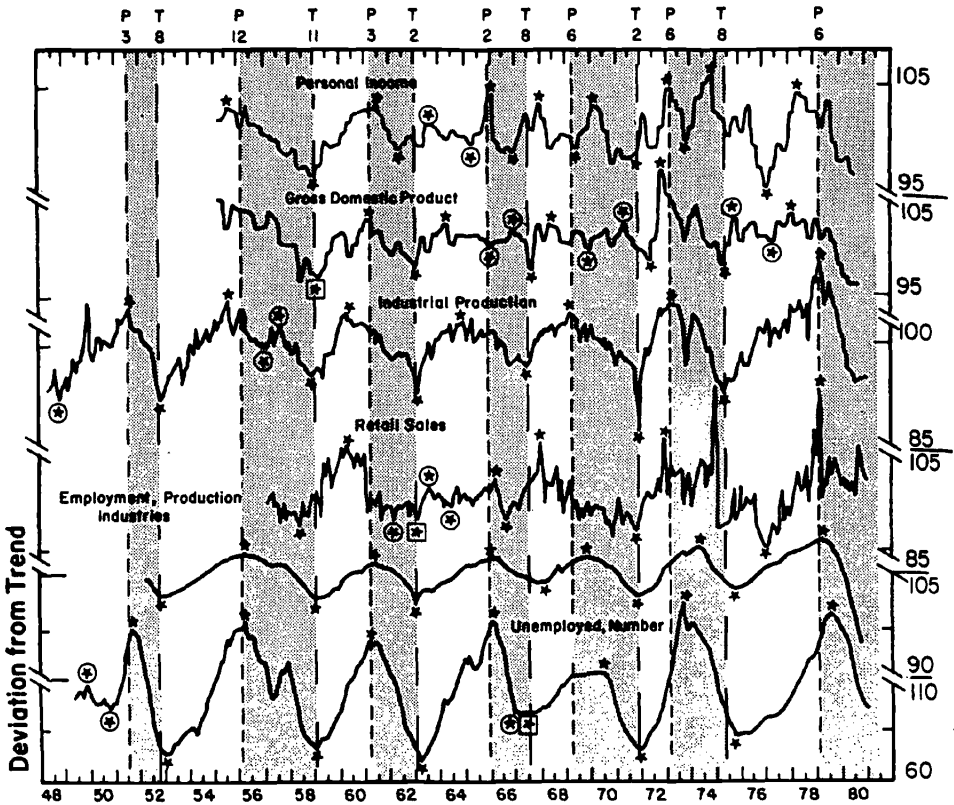


Figure 4A-3. United Kingdom (continued)

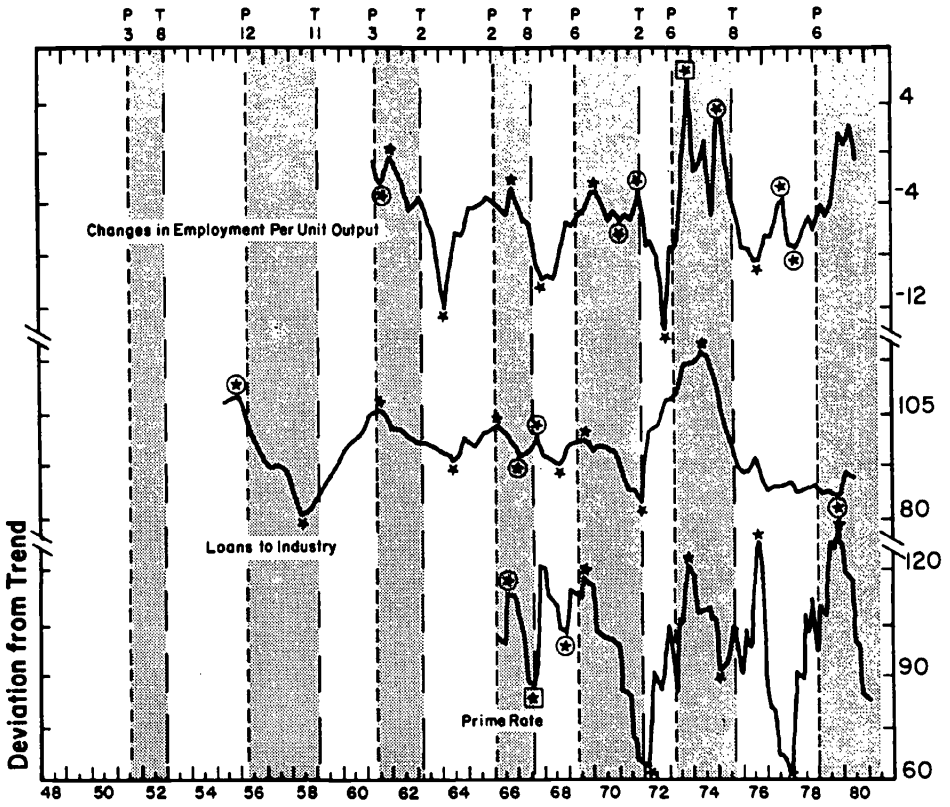


Figure 4A-3. United Kingdom (continued)

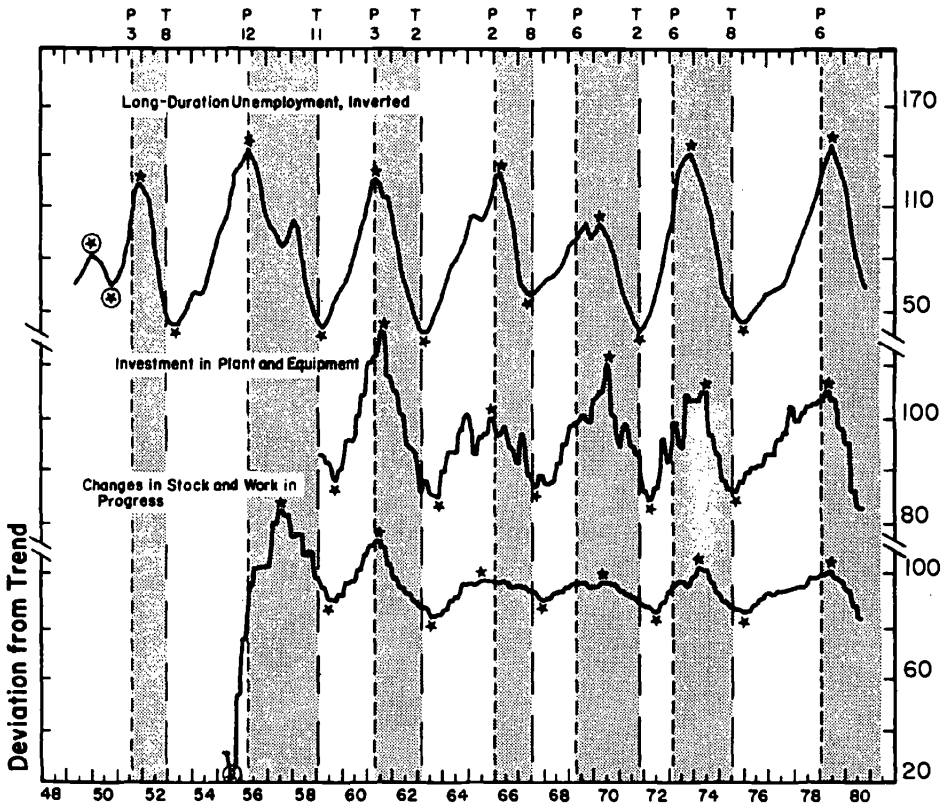


Figure 4A-4. West Germany, Components of Leading Composite Index.

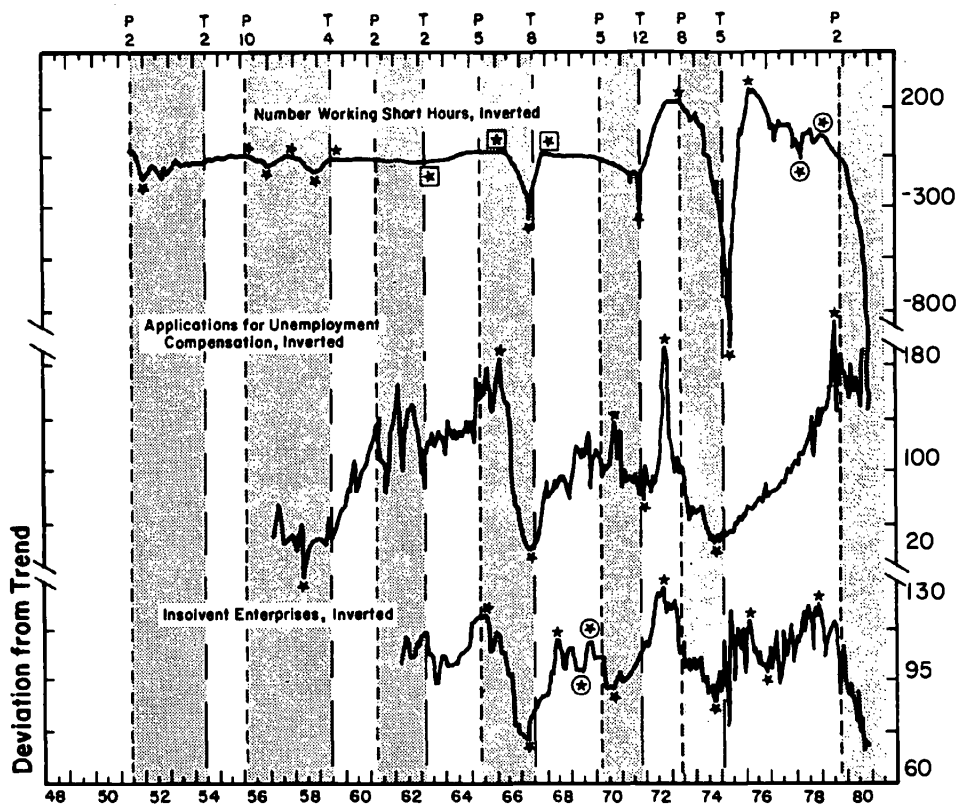
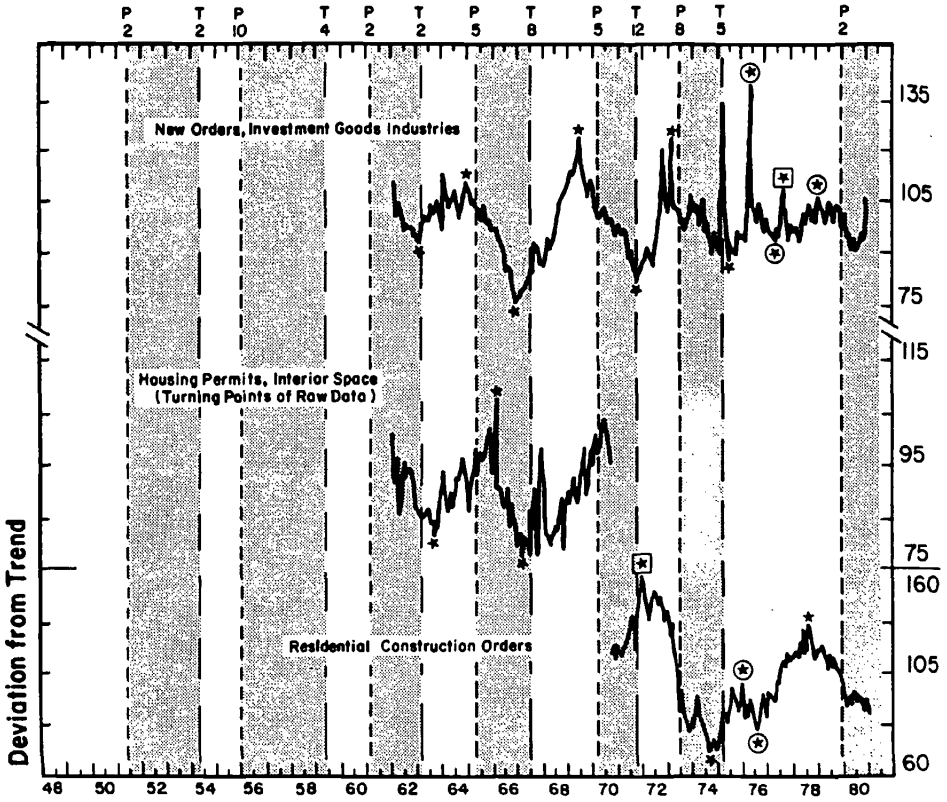


Figure 4A-4. West Germany (continued)



Deviation from Trend

Figure 4A-4. West Germany (continued)

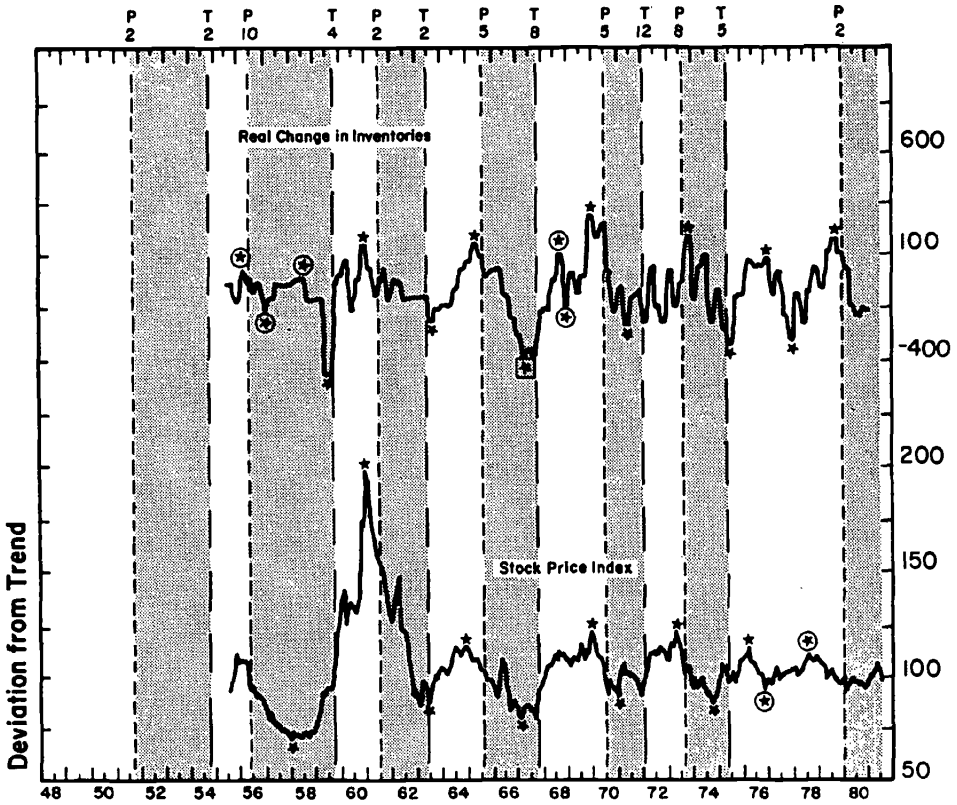


Figure 4A-4. West Germany (continued)

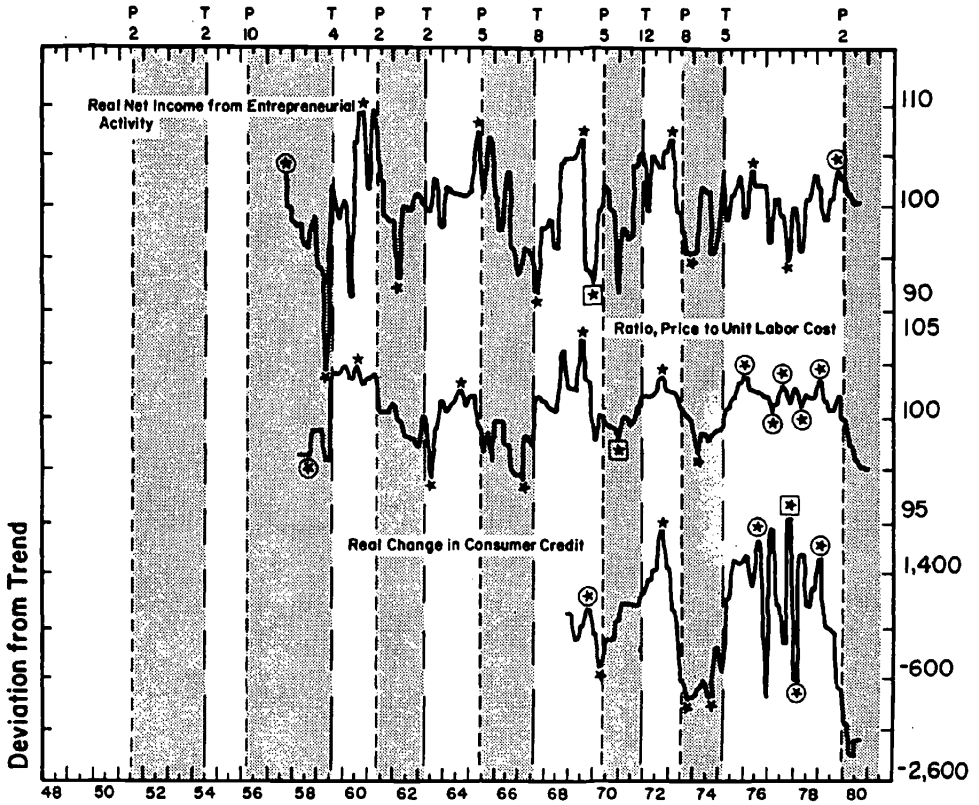


Figure 4A-4. West Germany (continued)

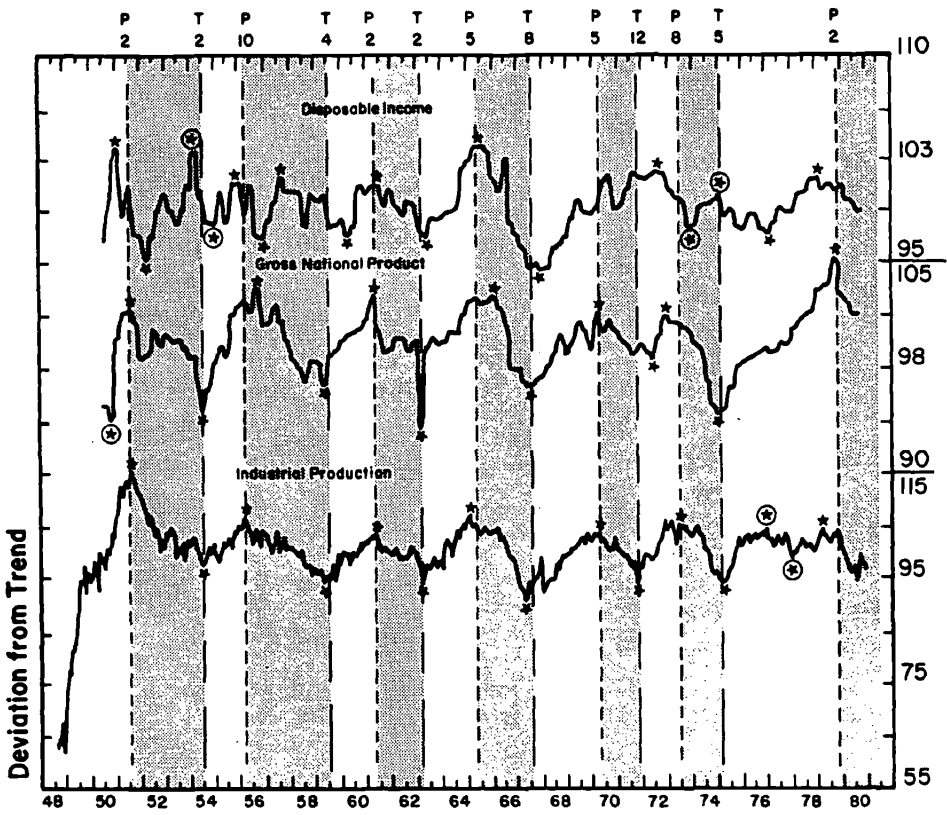
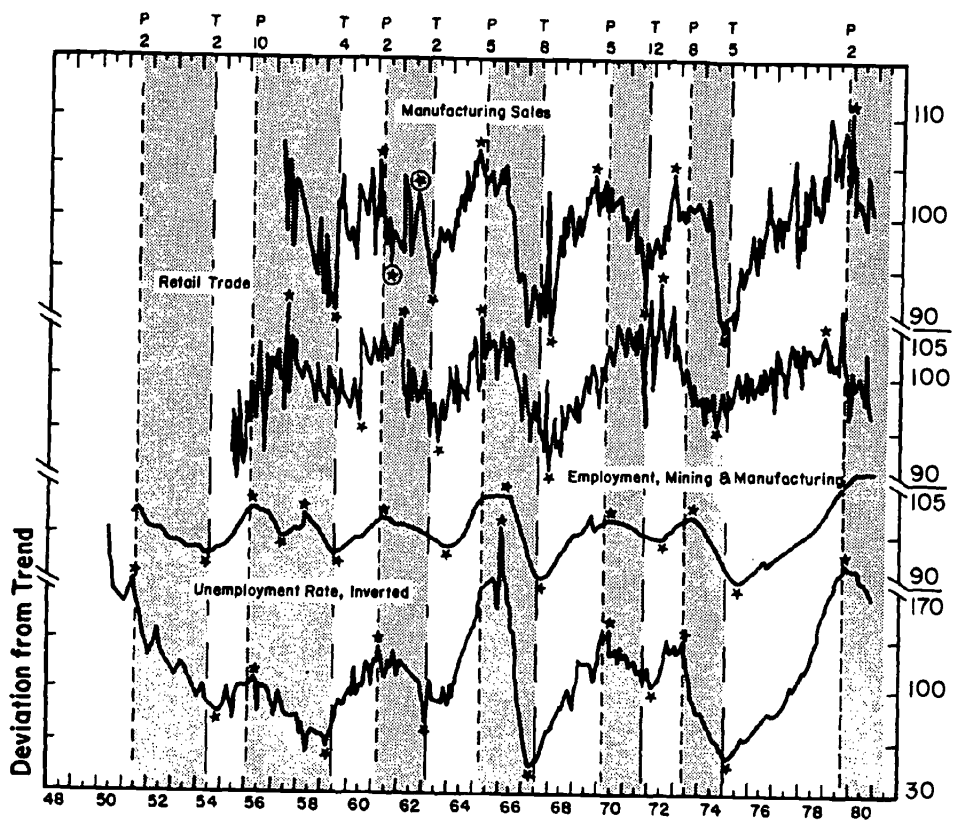


Figure 4A-4. West Germany (continued)



Deviation from Trend

Figure 4A-4. West Germany (continued)

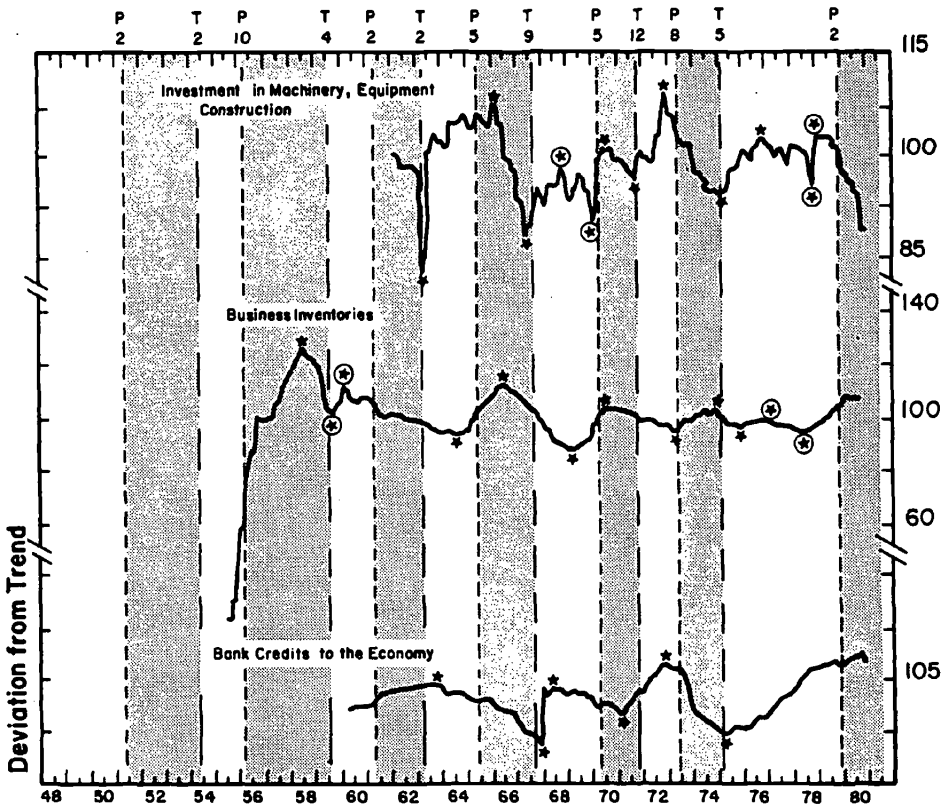


Figure 4A-4. West Germany (continued)

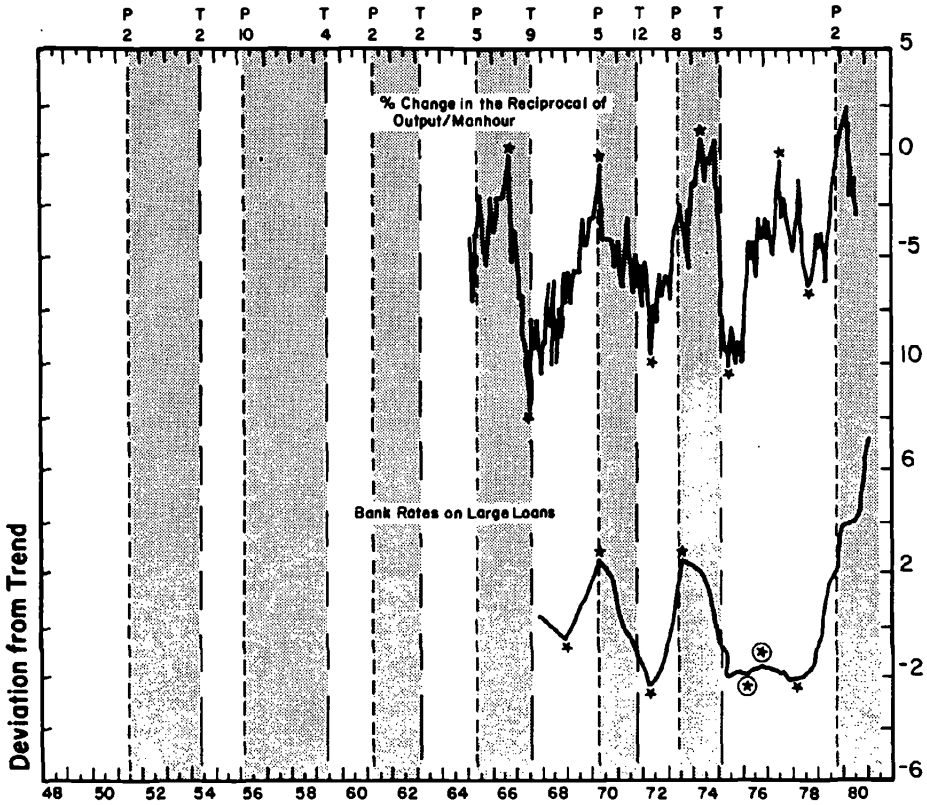


Figure 4A-5. France, Components of Leading Index.

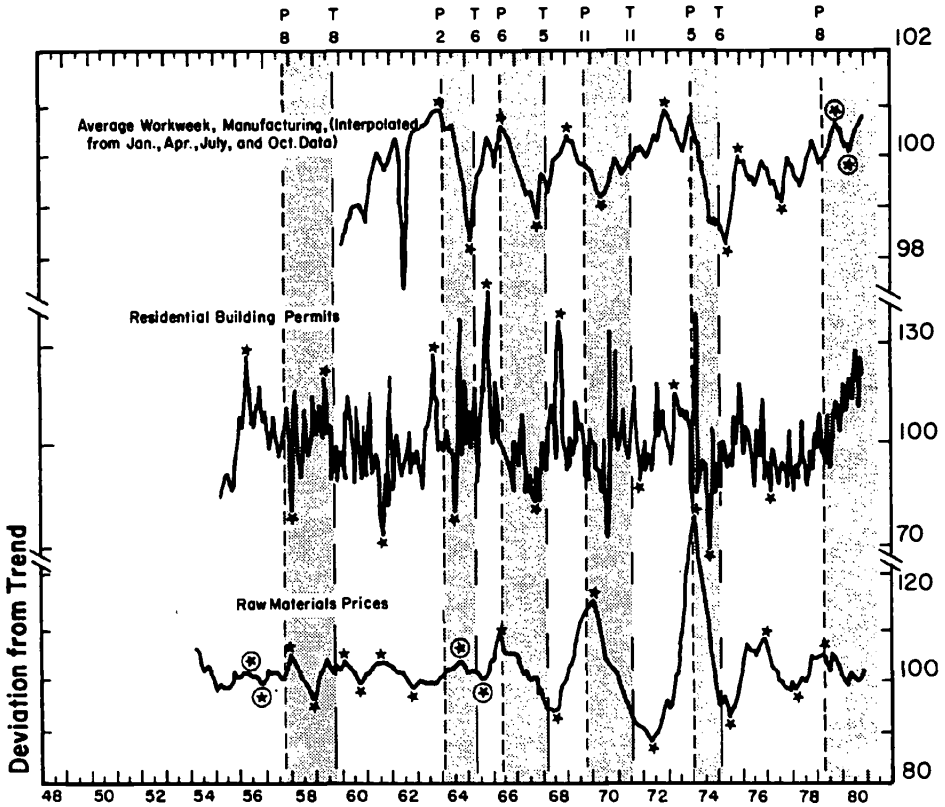
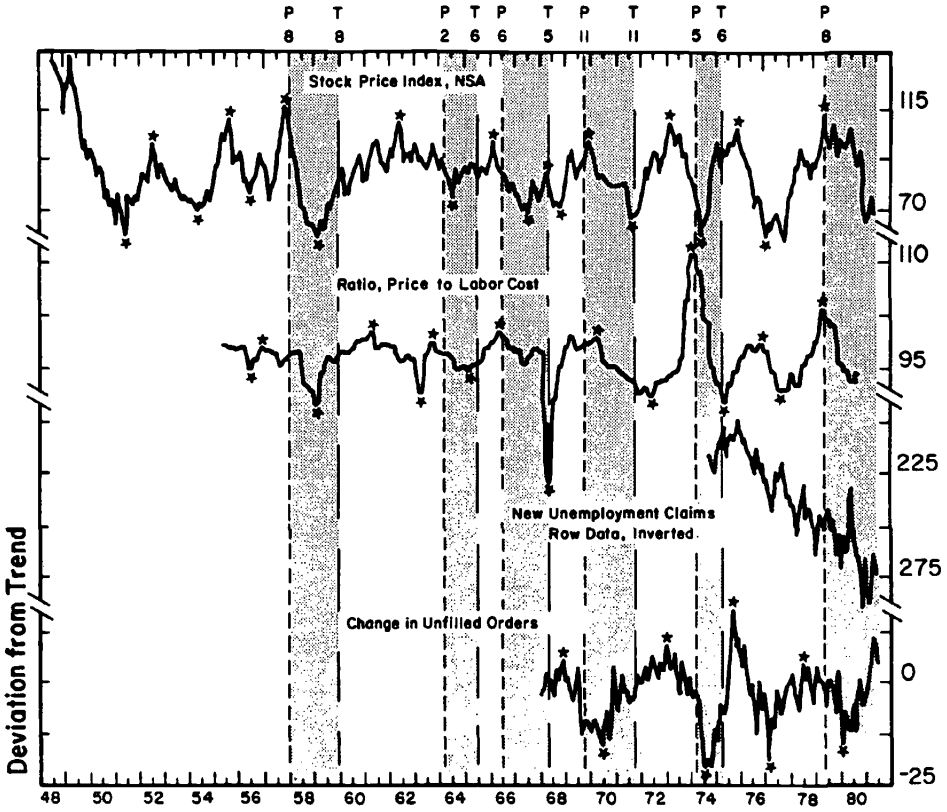


Figure 4A-5. France (continued)



Deviation from Trend

Figure 4A-5. France (continued)

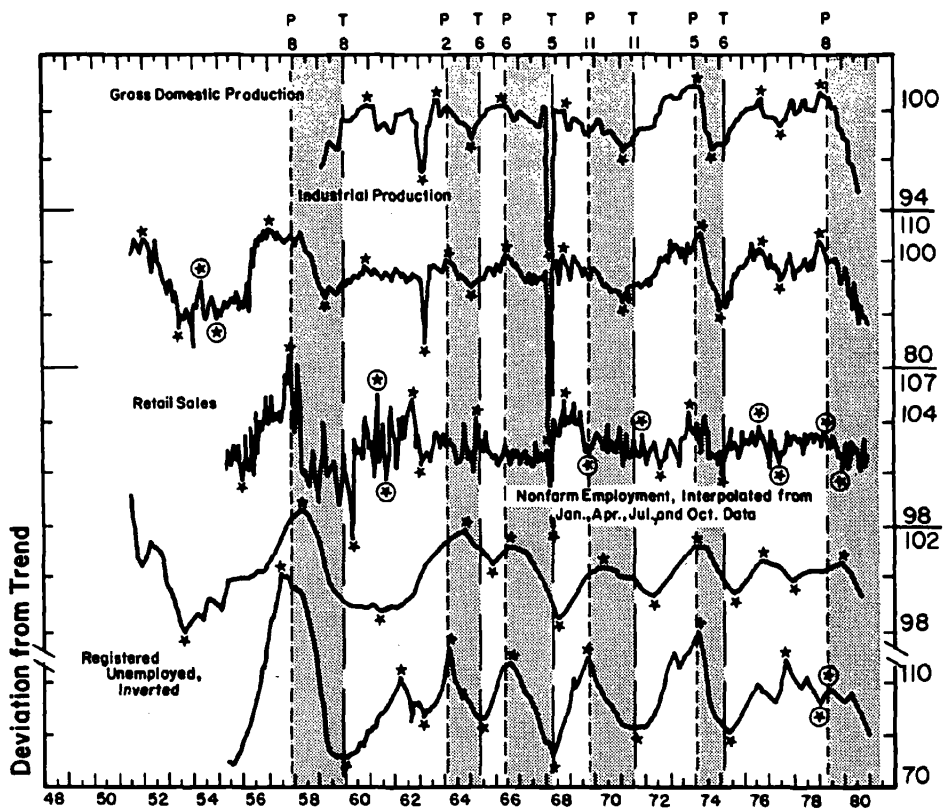


Figure 4A-5. France (continued)

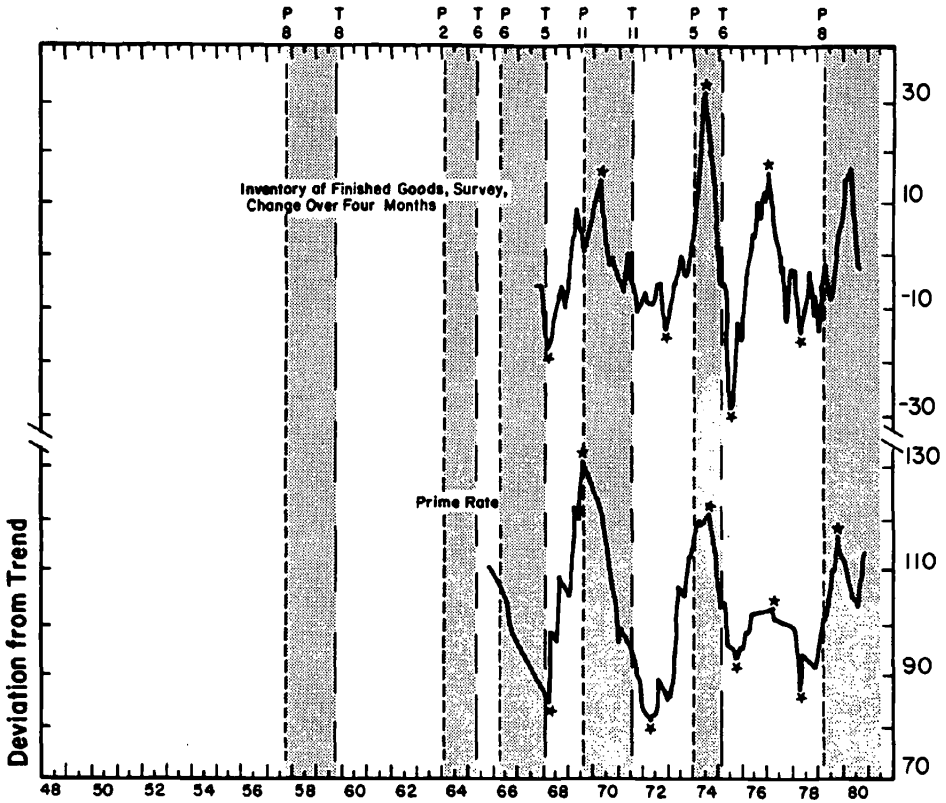


Figure 4A-6. Italy, Components of Coincident Composite Index.

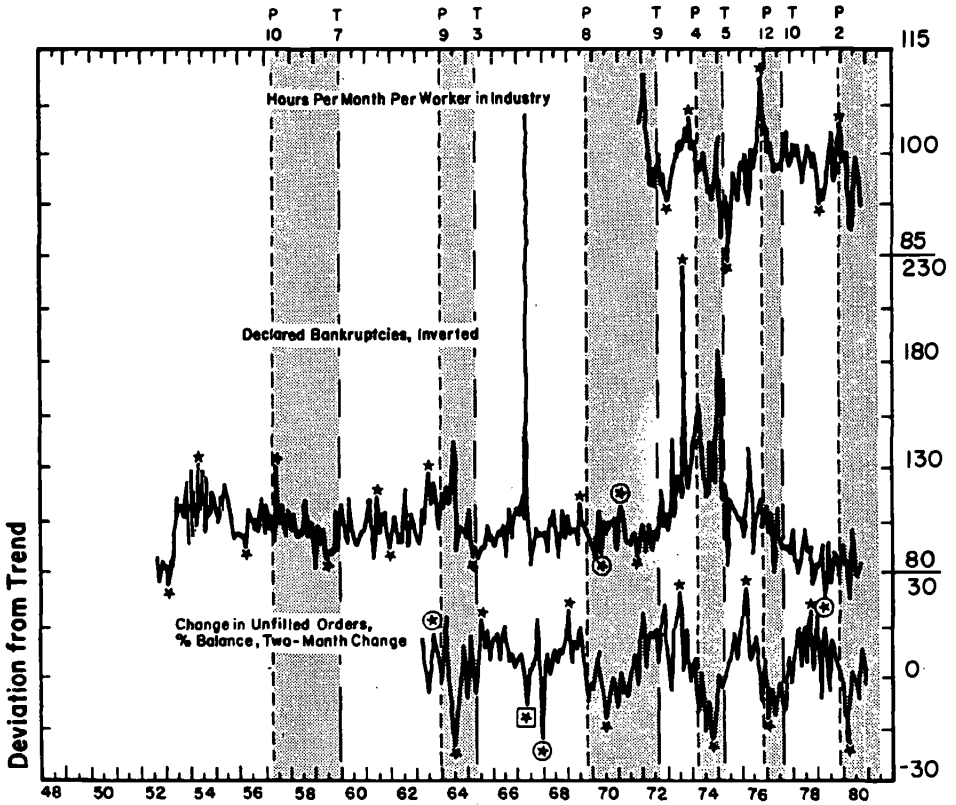
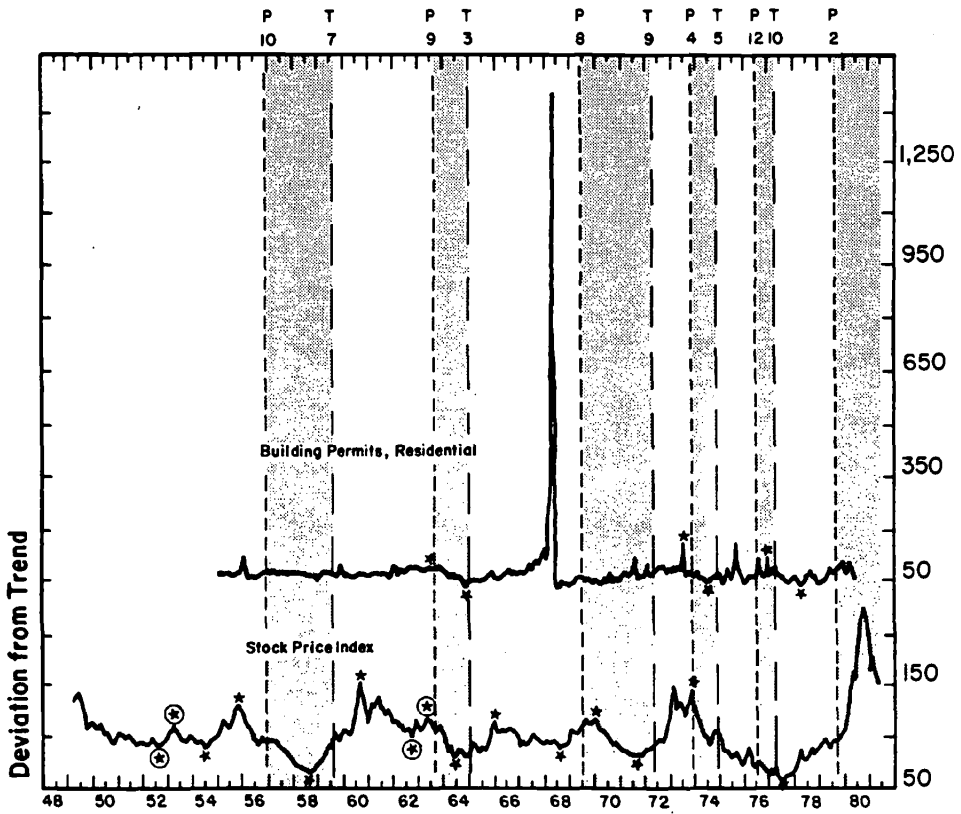


Figure 4A-6. Italy (continued)



Deviation from Trend

Figure 4A-6. Italy (continued)

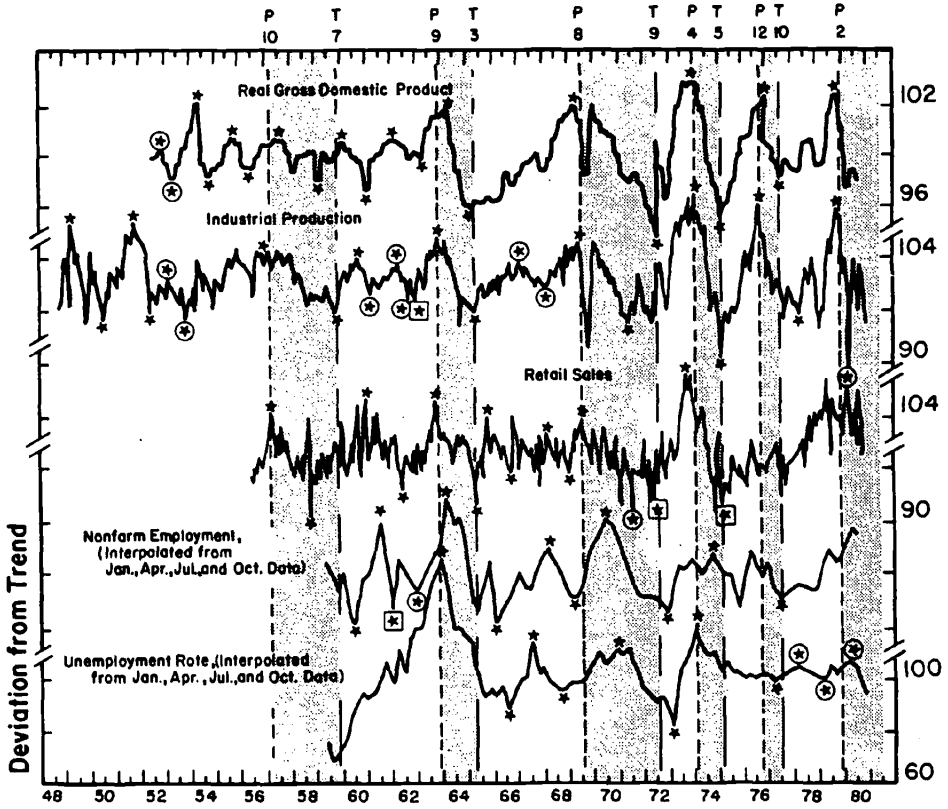


Figure 4A-6. Italy (continued)

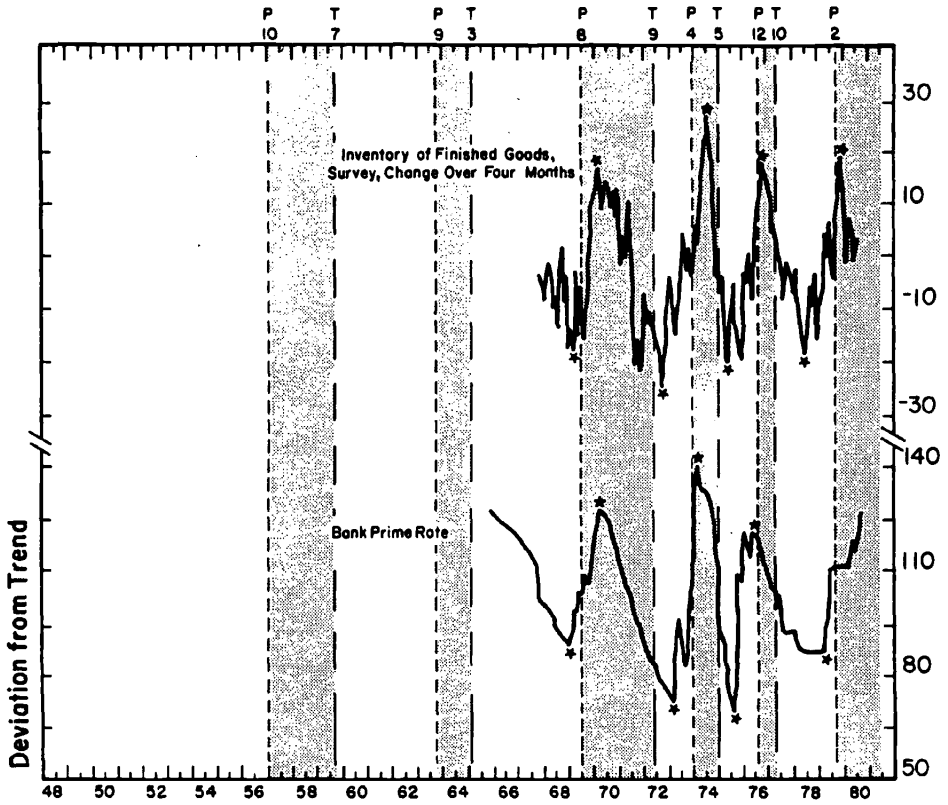


Figure 4A-7. Belgium, Components of Leading Composite Index.

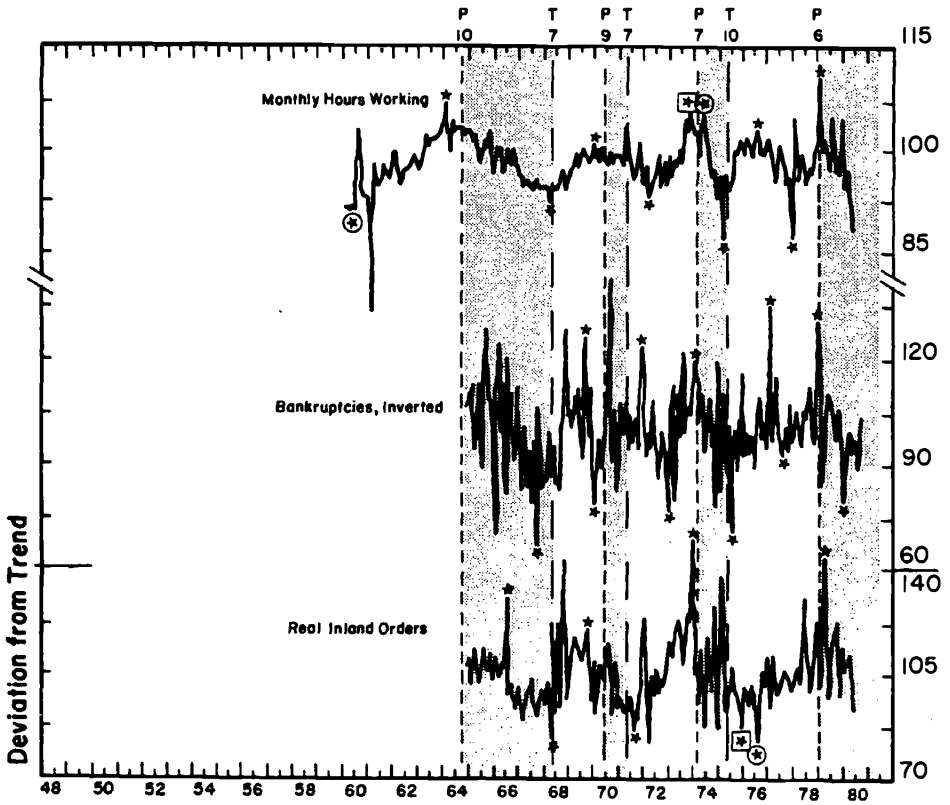
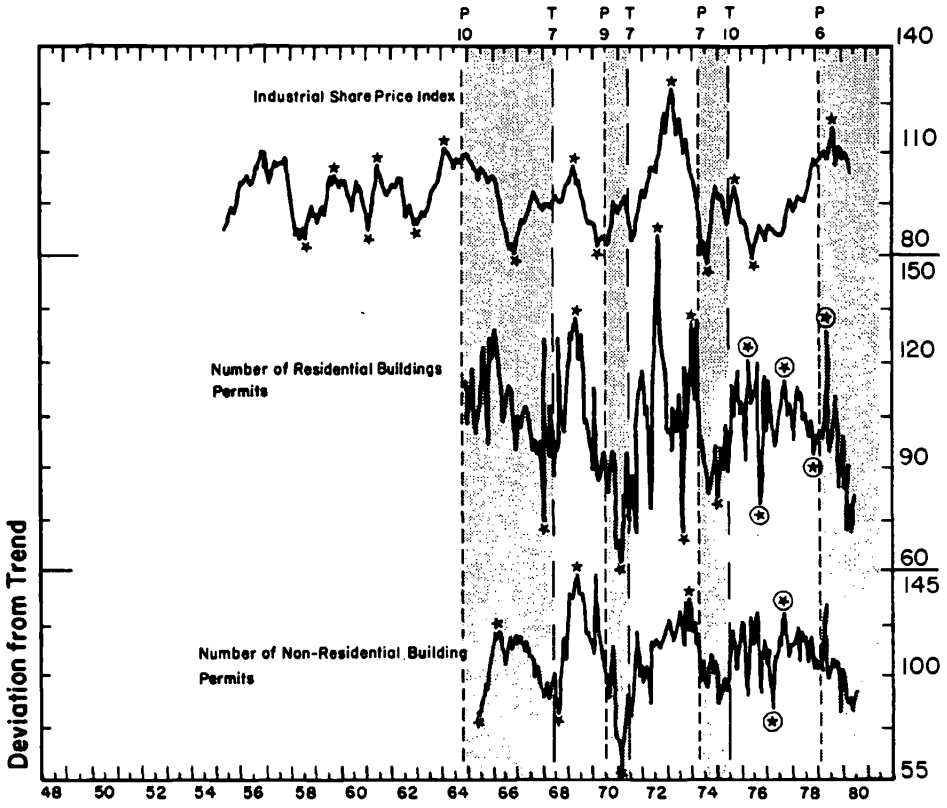


Figure 4A-7. Belgium (continued)



Deviation from Trend

Figure 4A-7. Belgium (continued)

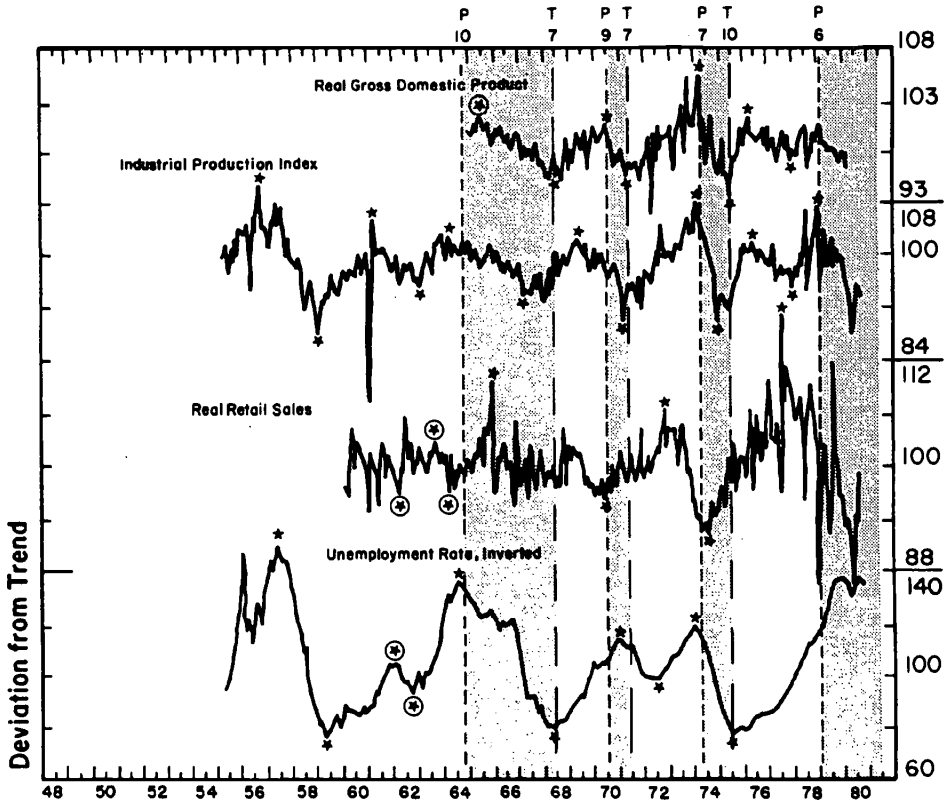
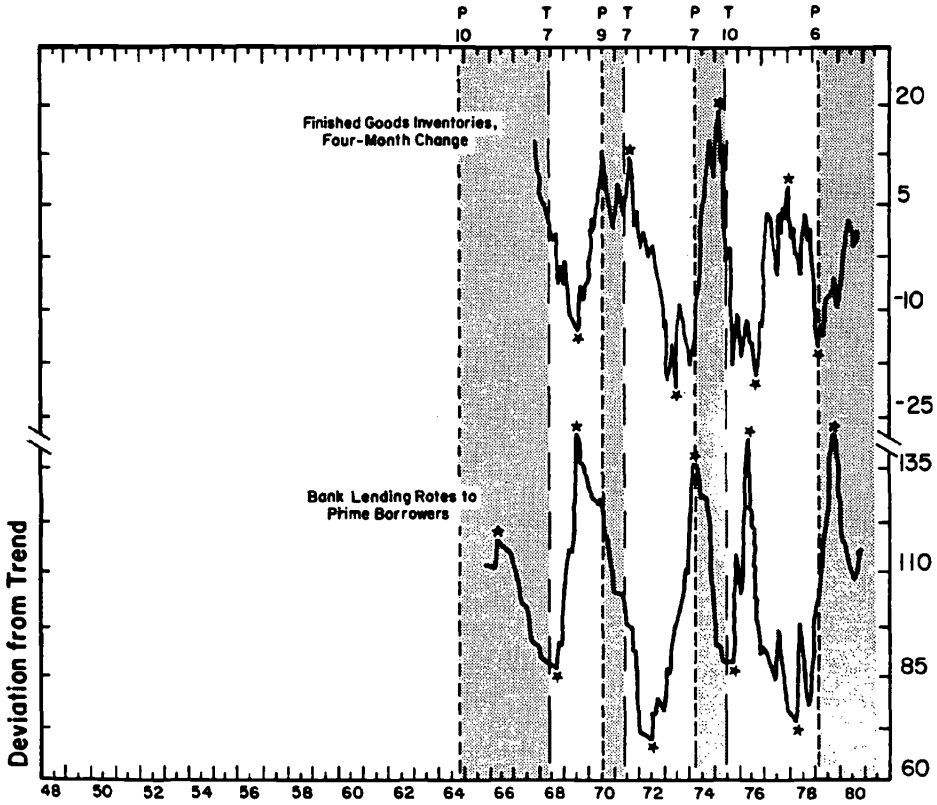


Figure 4A-7. Belgium (continued)



Deviation from Trend

Figure 4A-8. Netherlands, Components of Leading Index.

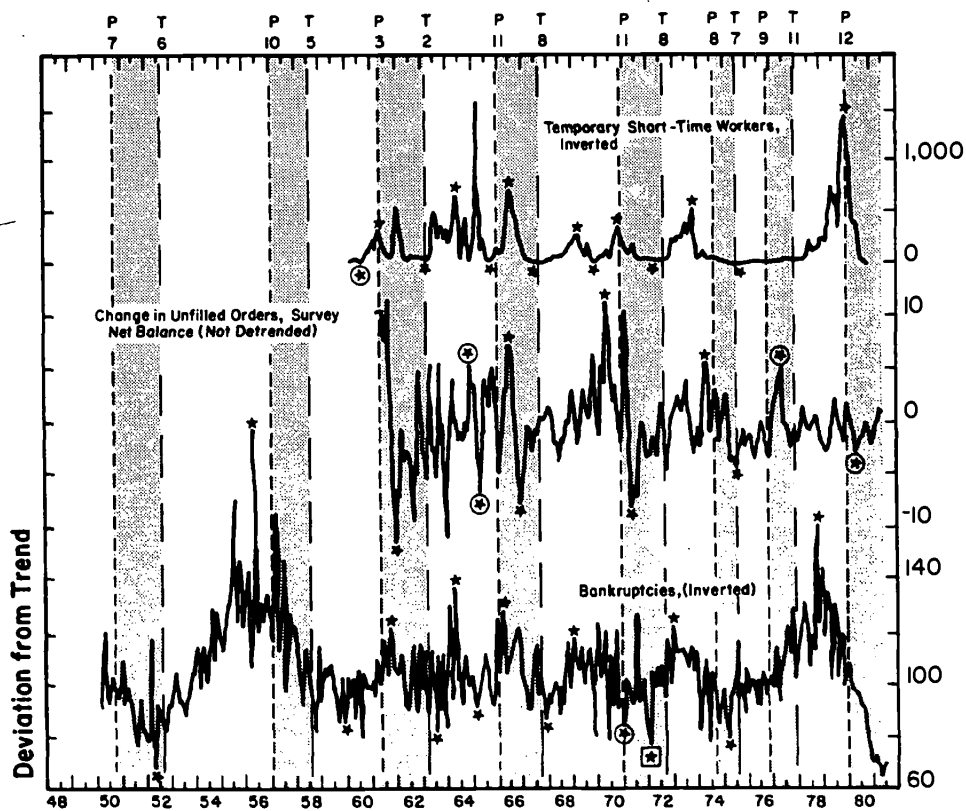
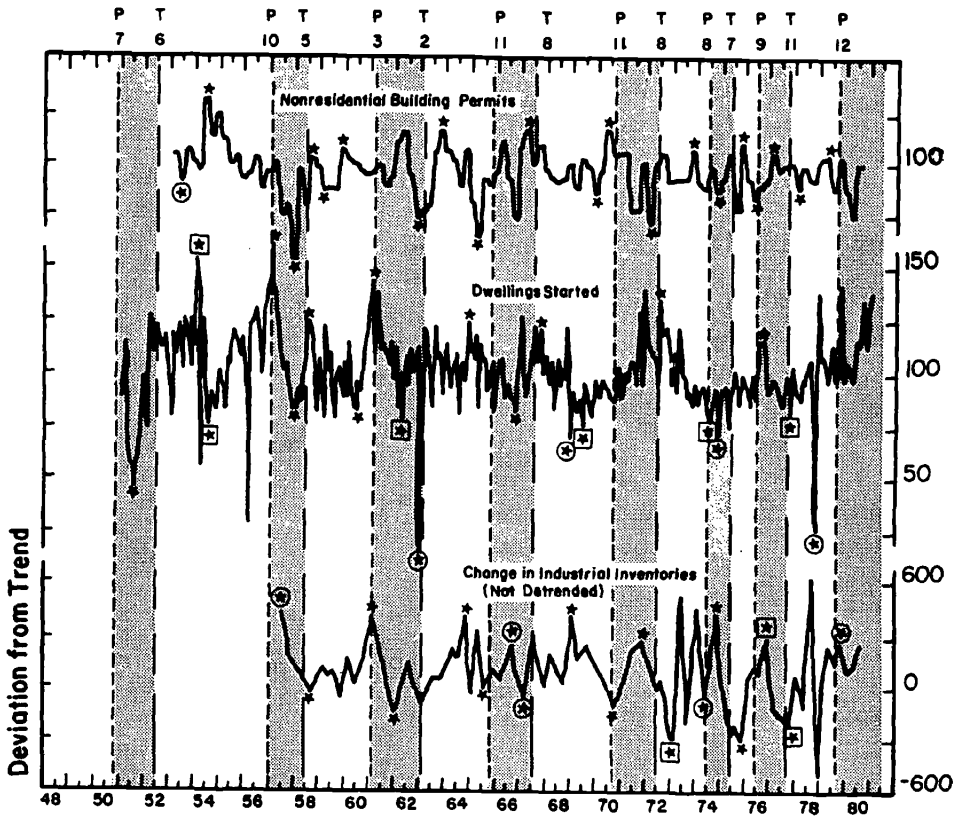


Figure 4A-8. Netherlands (continued)



Deviation from Trend

Figure 4A-8. Netherlands (continued)

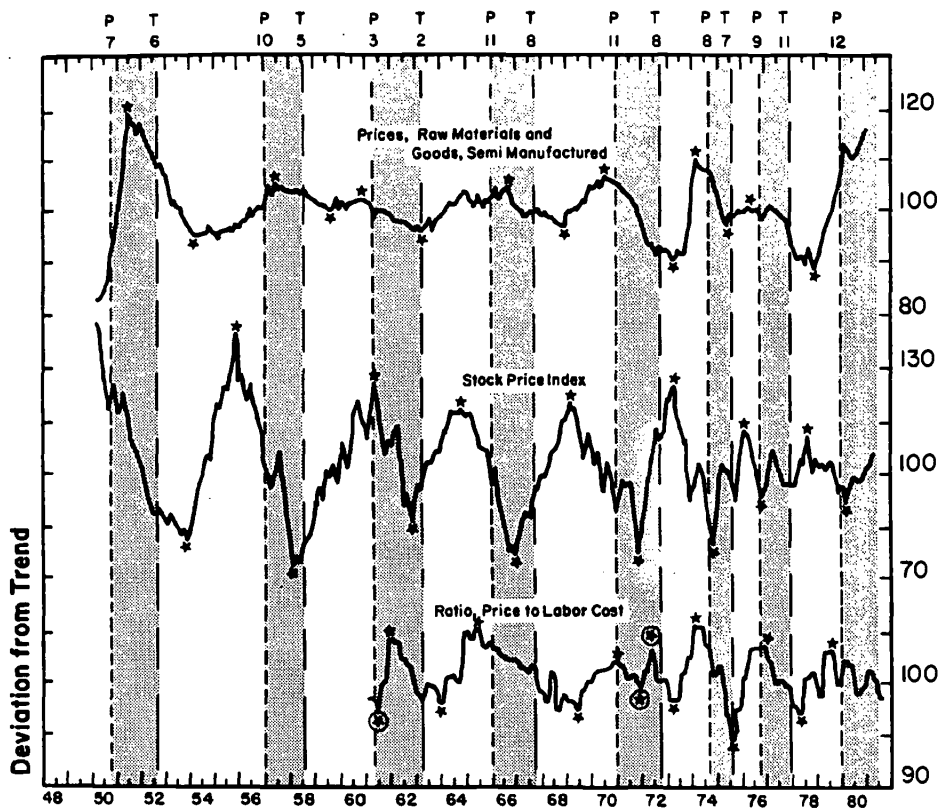
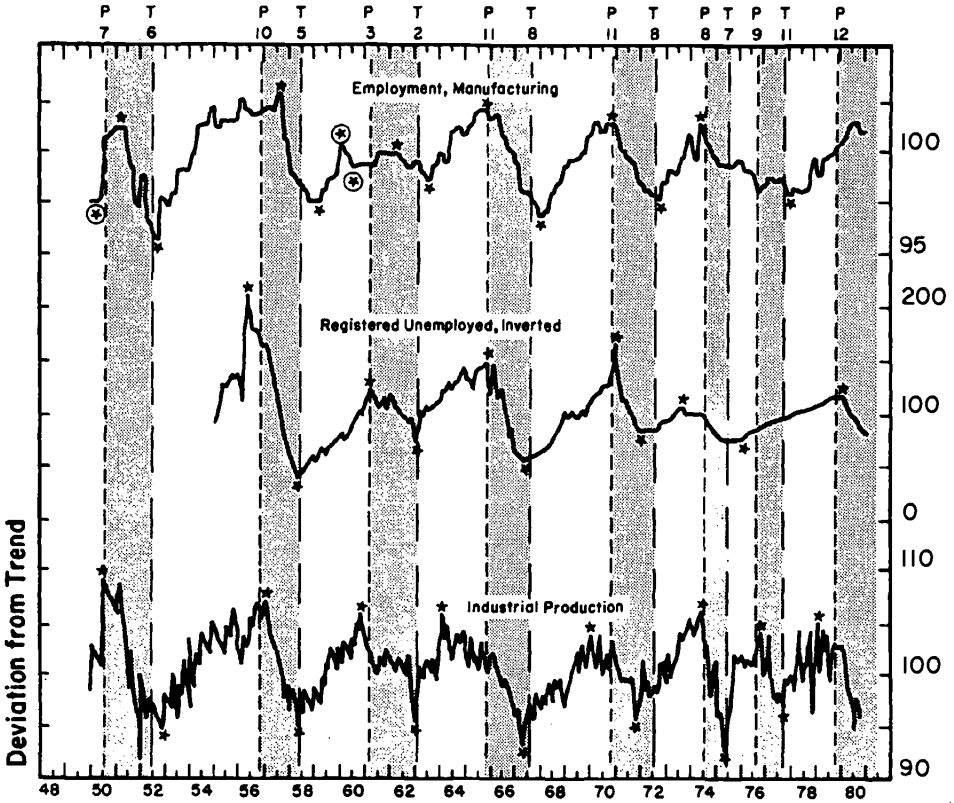


Figure 4A-8. Netherlands (continued)



Deviation from Trend

Figure 4A-8. Netherlands (continued)

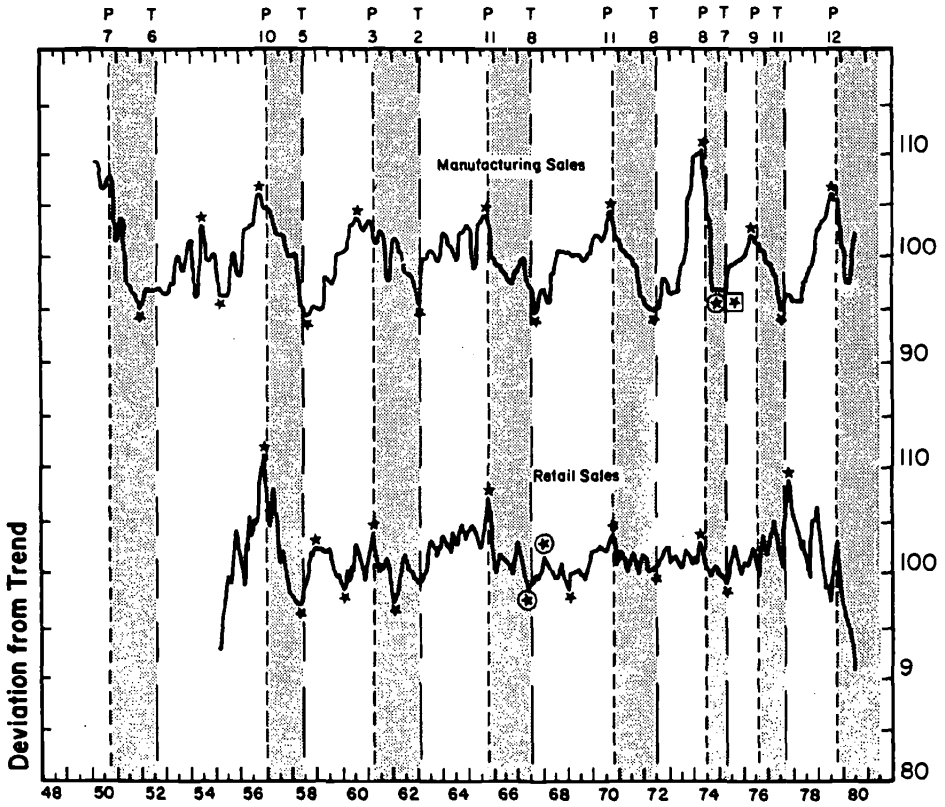
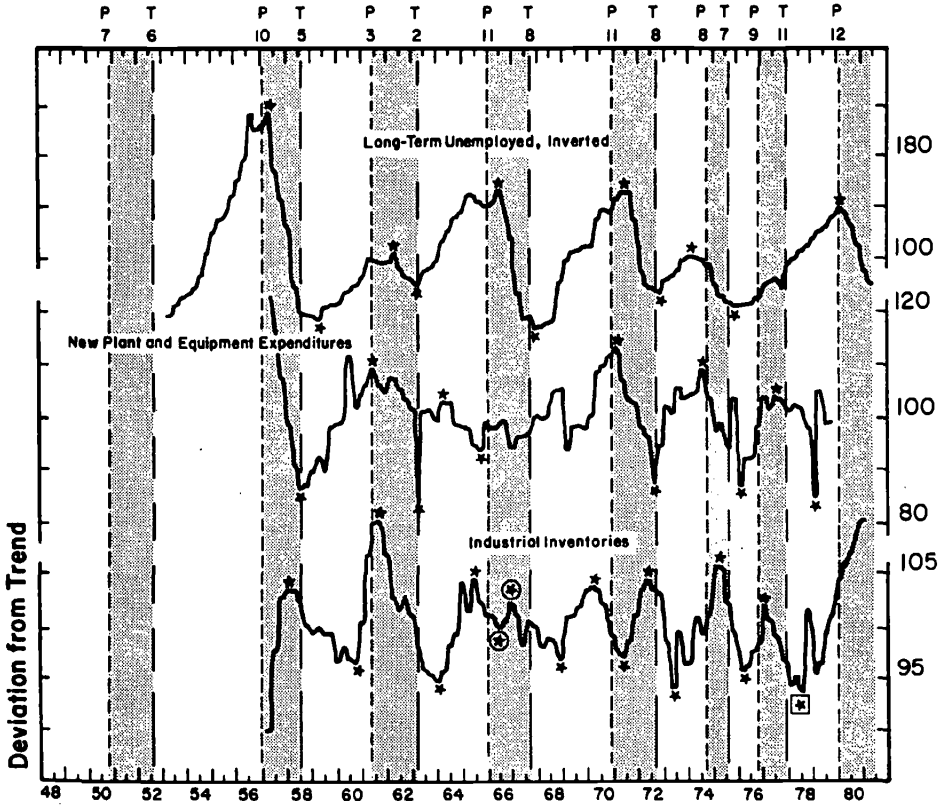


Figure 4A-8. Netherlands (continued)



Deviation from Trend

Figure 4A-9. Sweden, Components of Leading Composite Index.

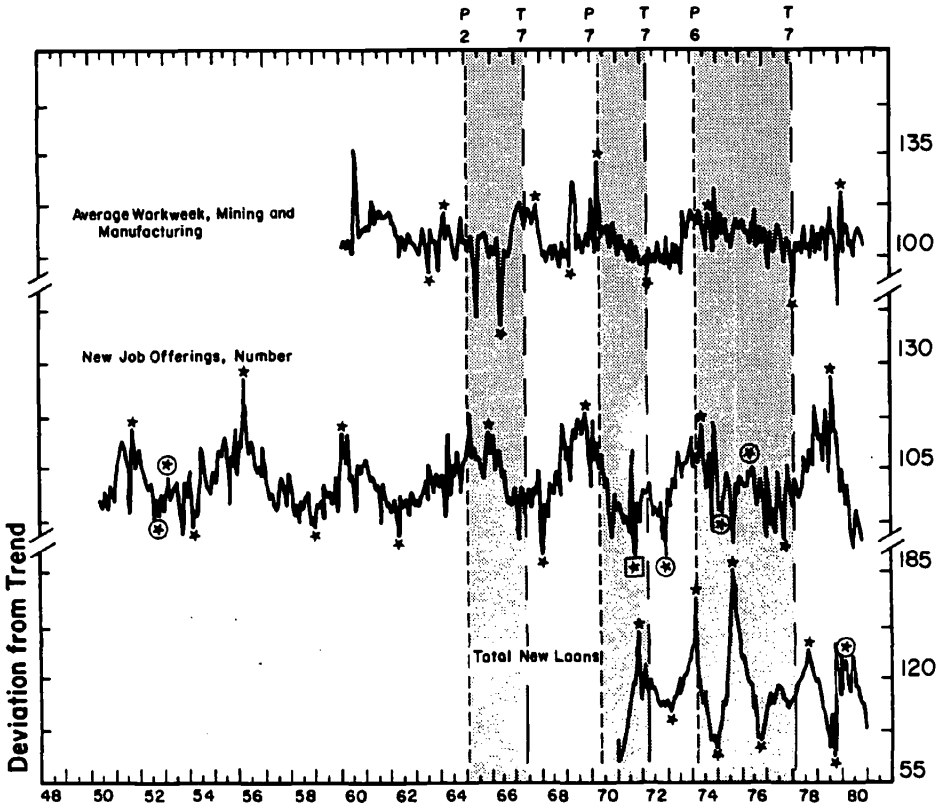


Figure 4A-9. Sweden (continued)

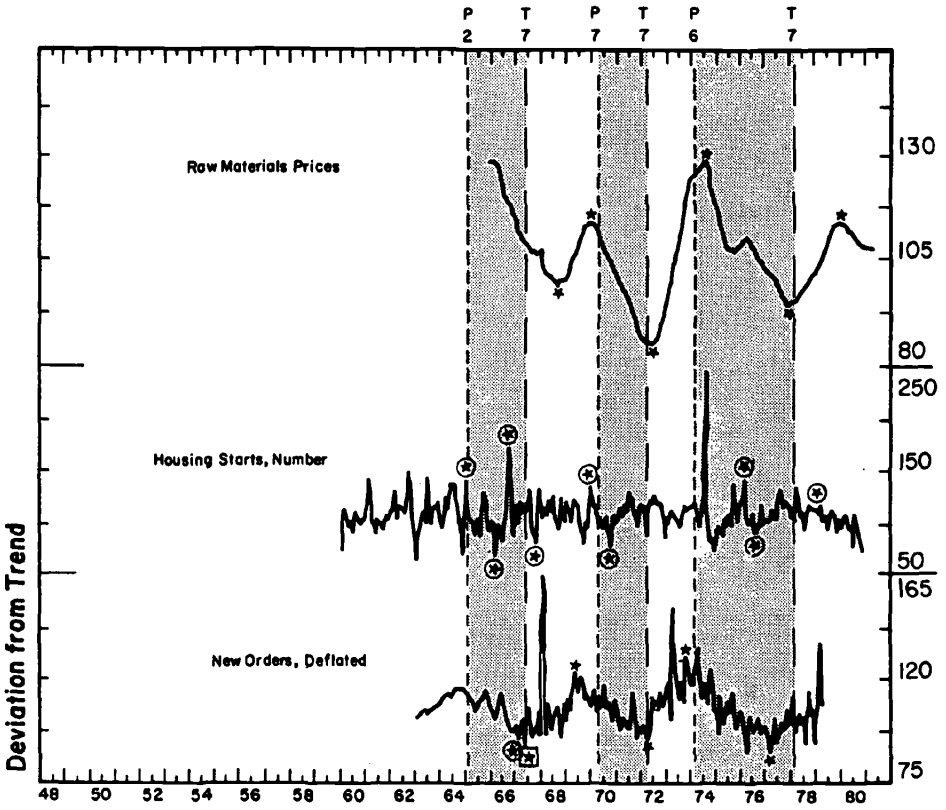


Figure 4A-9. Sweden (continued)

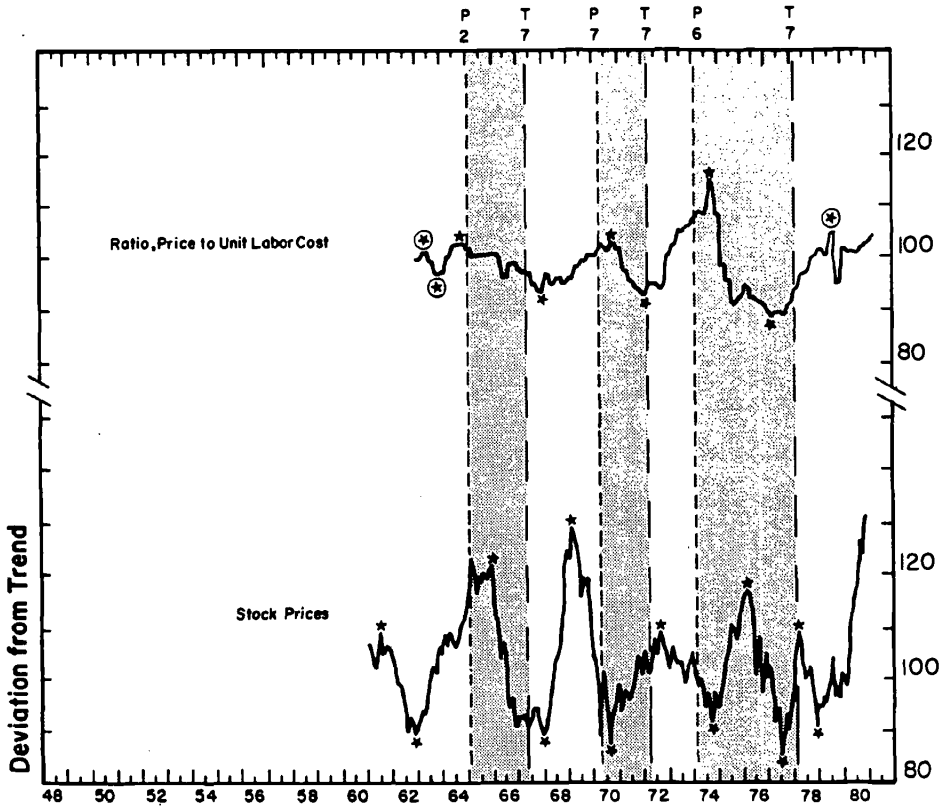


Figure 4A-9. Sweden (continued)

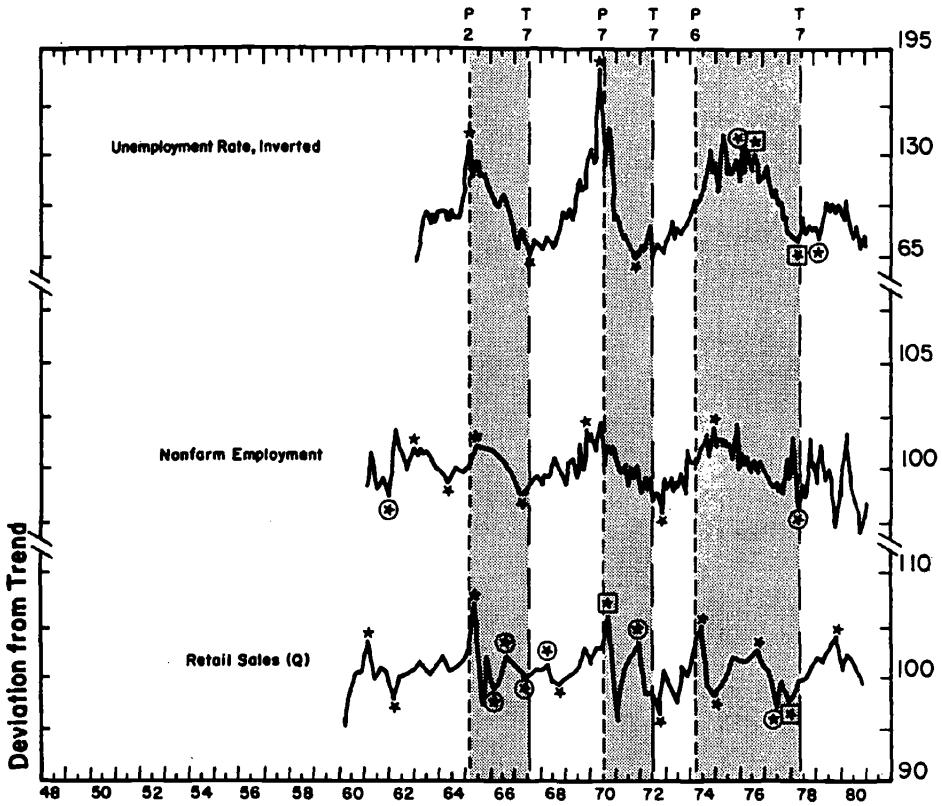


Figure 4A-9. Sweden (continued)

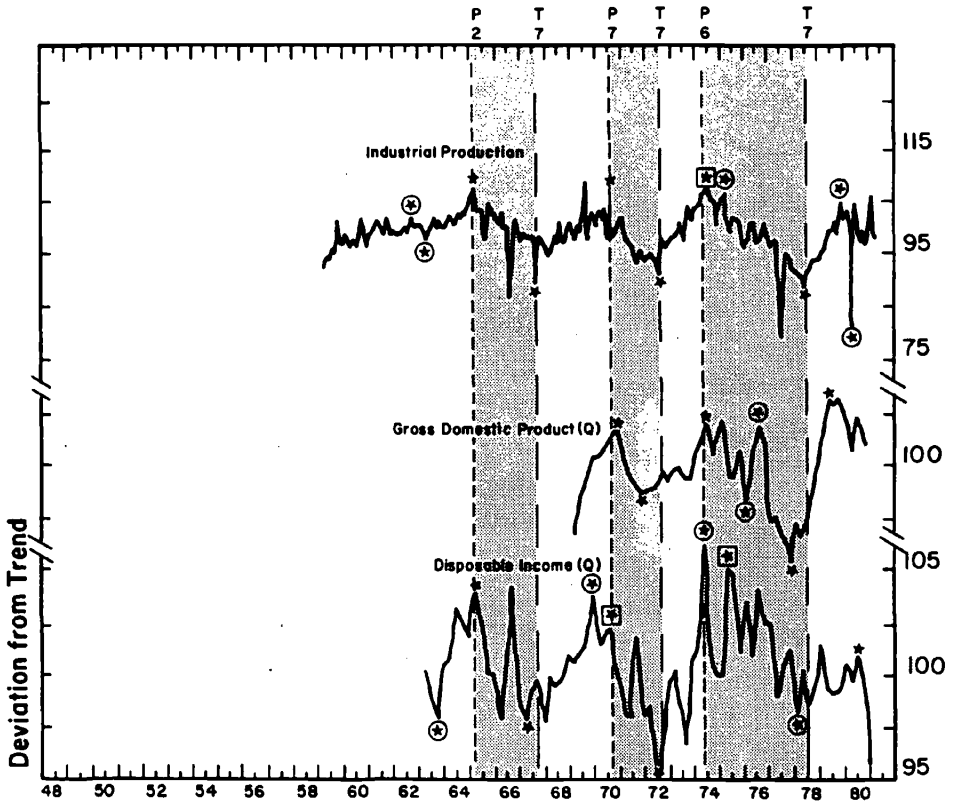
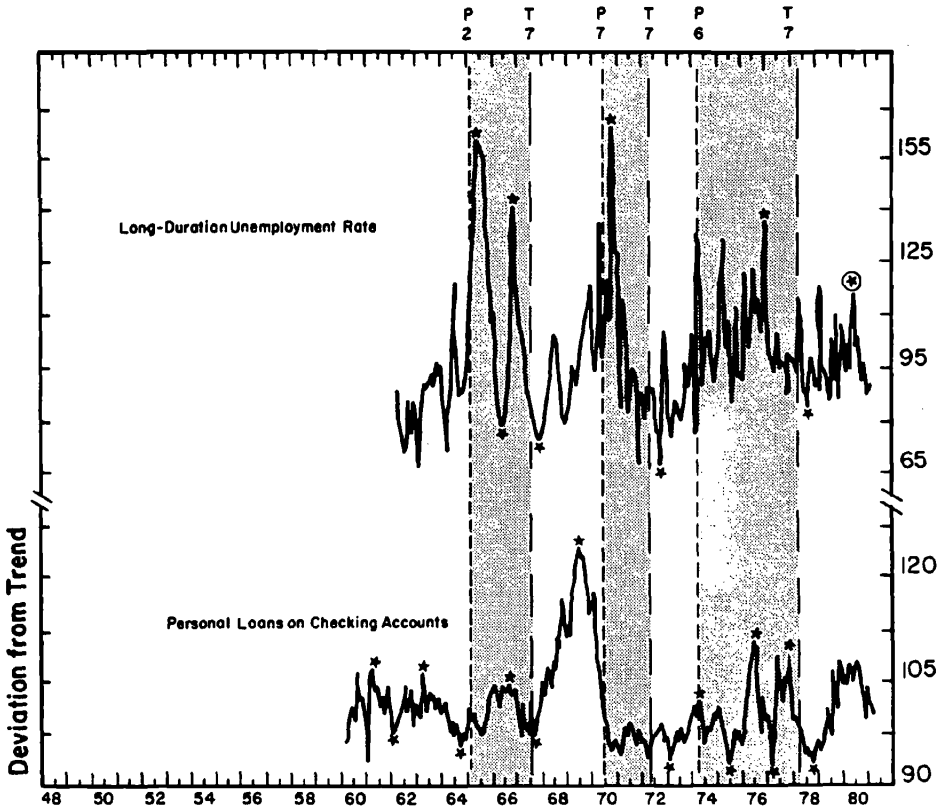


Figure 4A-9. Sweden (continued).



Deviation from Trend

Figure 4A-9. Sweden (continued)

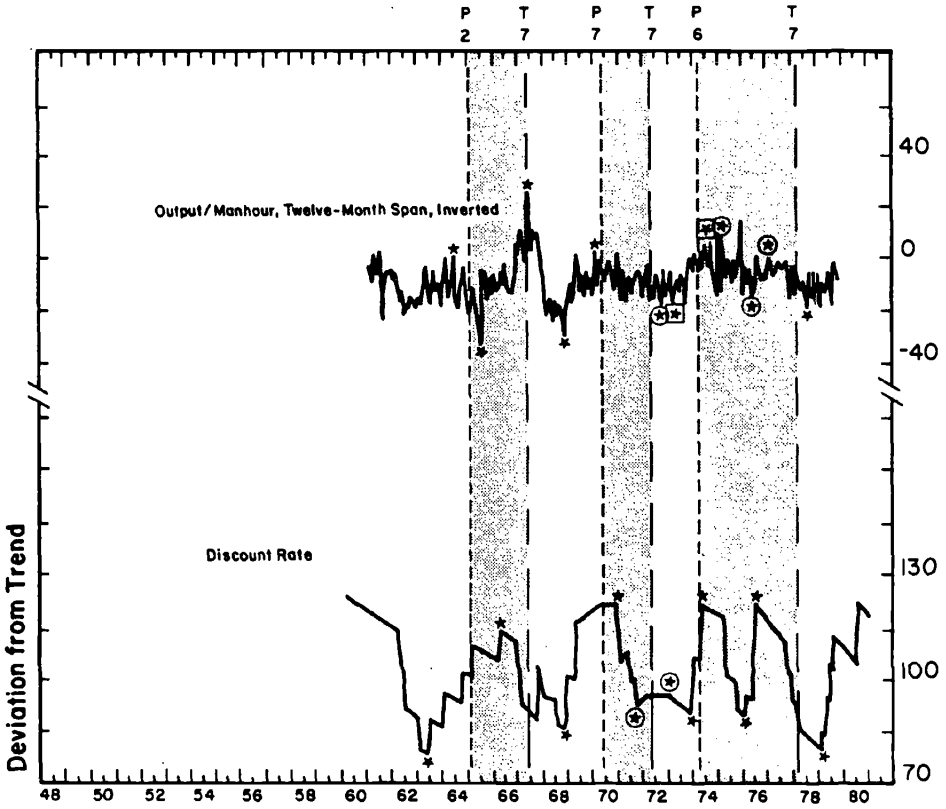


Figure 4A-10. Japan, Components of Leading Index.

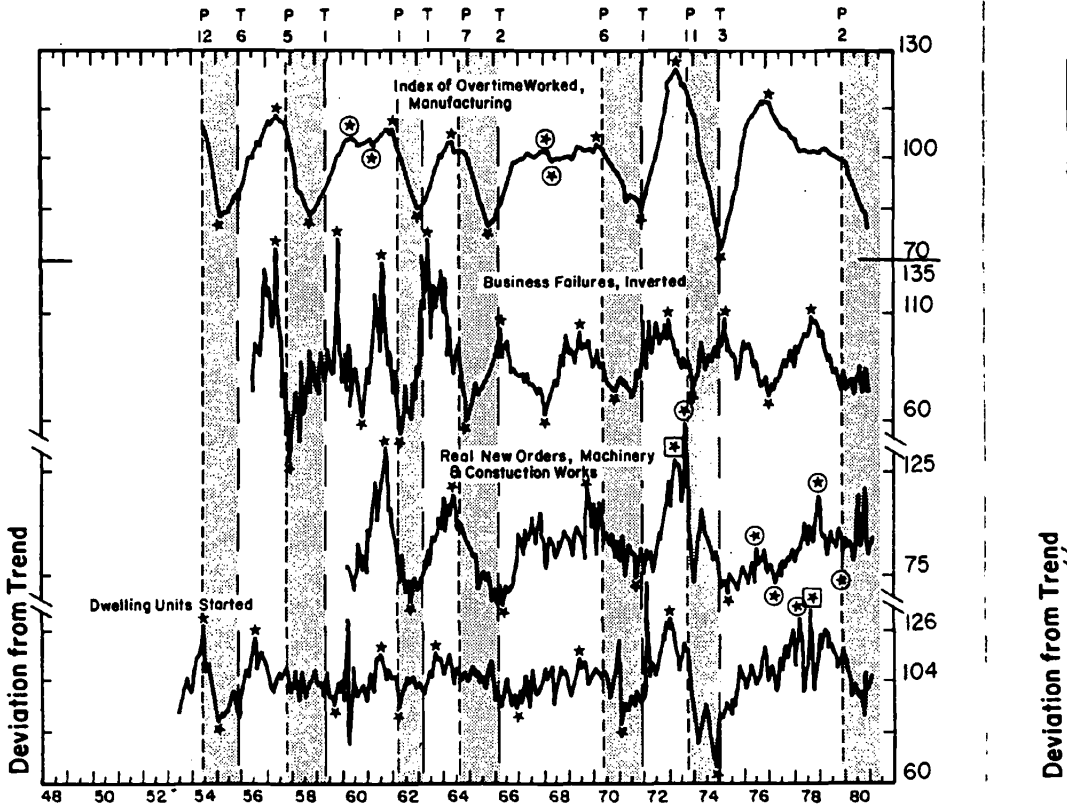


Figure 4A-10. Japan (continued)

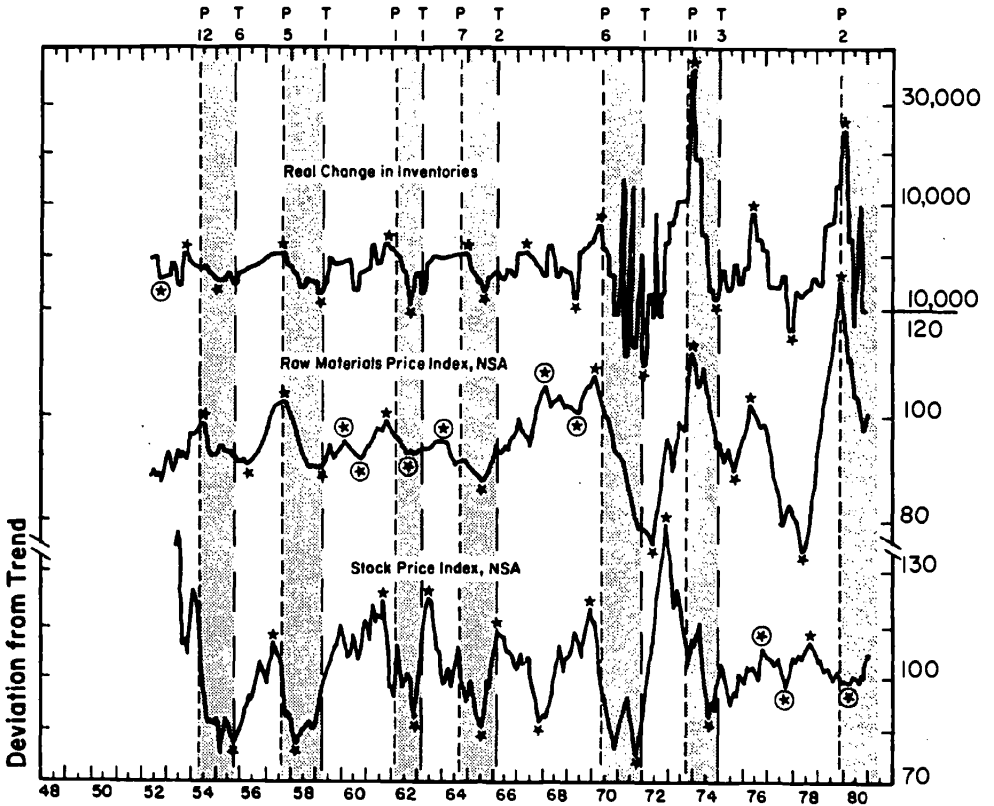
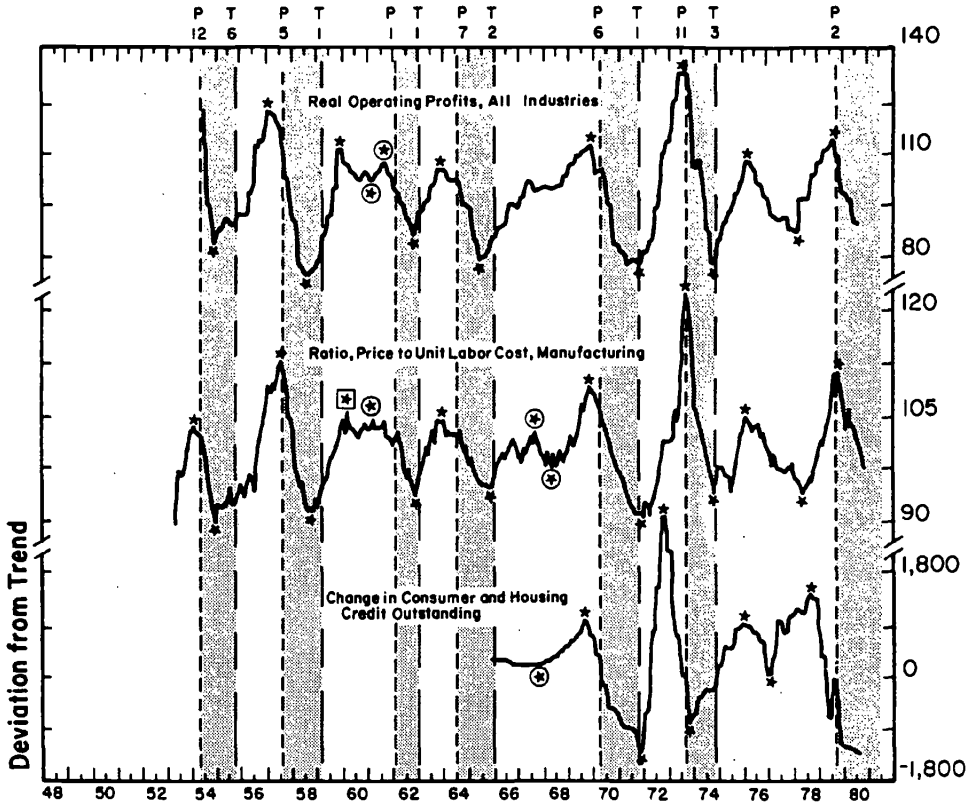


Figure 4A-10. Japan (continued)



Deviation from Trend

Figure 4A-10. Japan (continued)

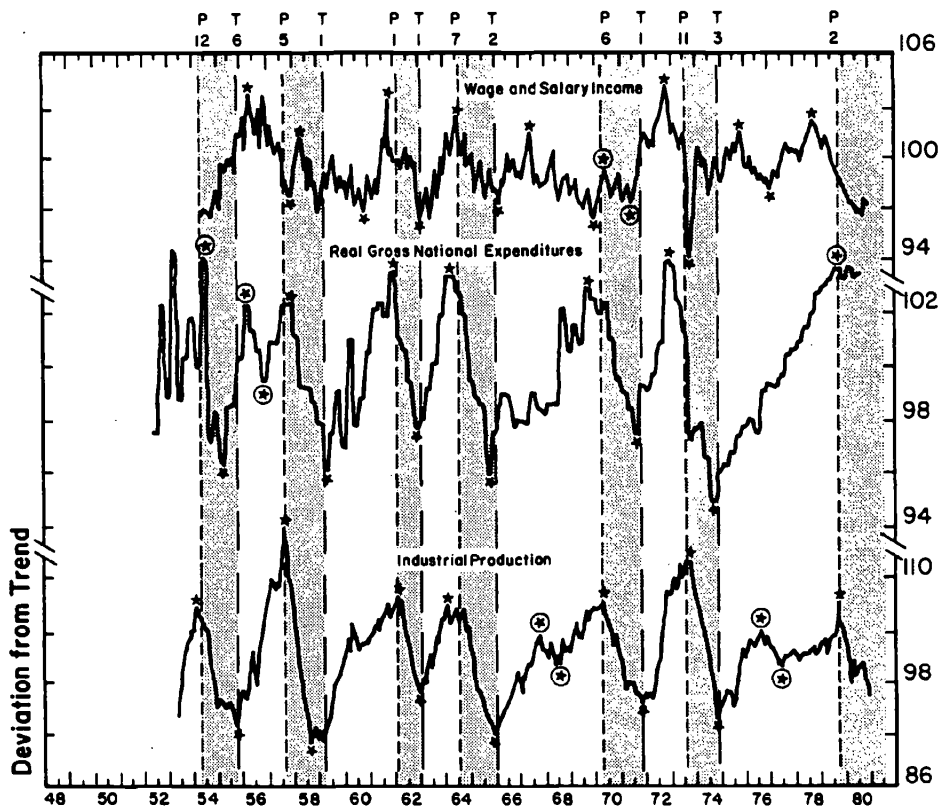


Figure 4A-10. Japan (continued)

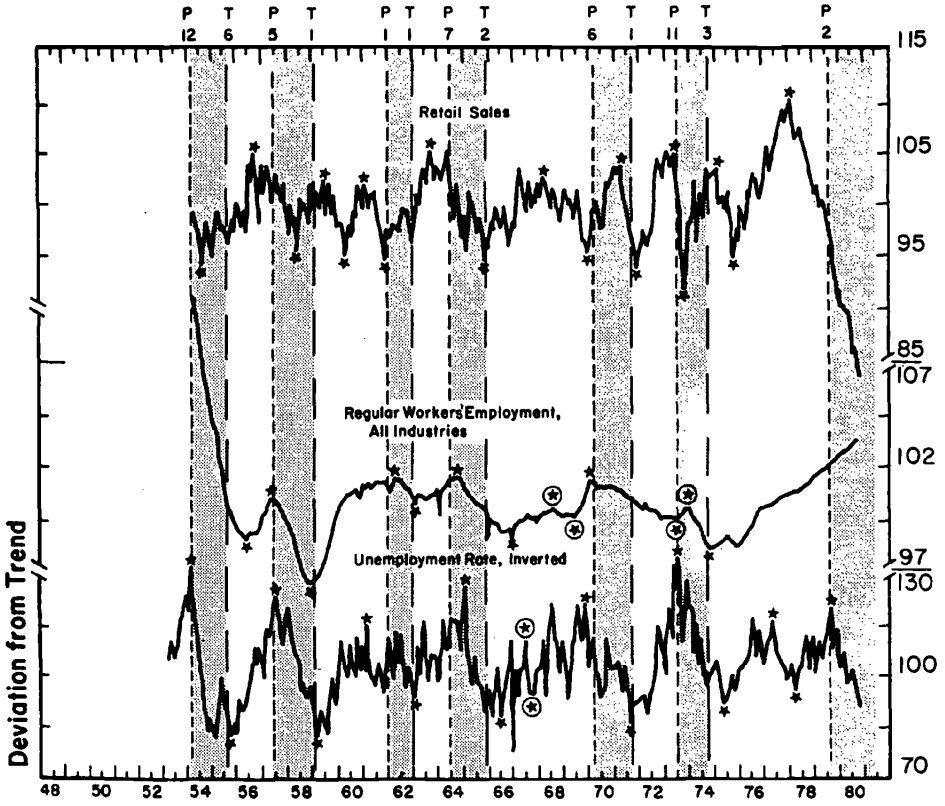
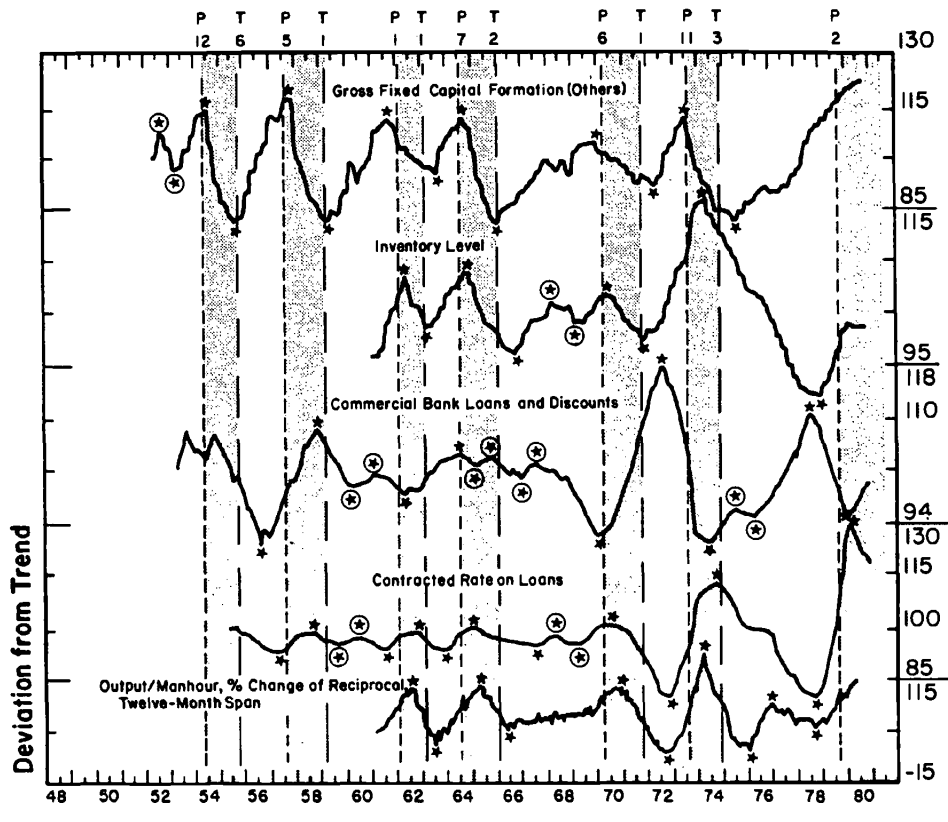


Figure 4A-10. Japan (continued)



APPENDIX 4B

TIMING OF INDIVIDUAL INDICATORS AT GROWTH CYCLE TURNING POINTS, TEN MARKET-ORIENTED COUNTRIES

(pages 204 through 223)

The numbers in the far left column identify the series and are based on the United States 1966 classification of indicators. They appear as 1.0, 2.0, etc. For other countries, the decimal place digit is zero when the equivalent series in other countries is identical to the United States series. When the decimal place digit is 1 or 2 this indicates a different series was the closest equivalent to the United States series. For example, 3.1 in Canada refers to New Orders, durable goods, the closest Canadian equivalent to the United States series: 3.0, New Orders, consumer goods and materials.

Table 4B-1. Individual Indicators and Composite Indexes, Lead (+) or Lag (-) at Growth Cycle Turning Points, in Months, United States.

	Peaks											
	7/48	3/51	3/53	2/57	2/60	5/62	6/66	3/69	3/73	12/78		
<i>Leading Indicators</i>												
1.0 Average work week, manufacturing	n.a.	+1	-3	-15	-9	-1	-4	-5	+1	-1		
2.0 Initial claims, unemployment insurance (inverted)	n.a.	0	-4	+1	-10	-1	-2	+1	-1	-2		
4.0 Net business formation	n.a.	n.m.	-6	-20	-11	n.m.	-20	-2	-5	-12		
3.0 New orders, consumer goods and materials	-1	-2	-2	-23	-12	n.m.	-3	-4	0	+1		
5.0 Contracts and orders, plant and equipment	n.a.	+2	n.m.	-3	-11	n.m.	-4	+1	+7	+3		
6.0 New building permits, private housing units	n.a.	-8	-5	-24	-15	+21	-5	-12	-3	-6		
7.0 Change in business inventories (q)	+1	-4	n.m.	-15	0	-3	+5	n.m.	+8	-10		
8.0 Industrial materials price index	n.a.	-1	n.m.	-2	-1	-12	-3	+10	+12	+14		
9.0 Stock price index, 500 S&P common	-1	-1	n.m.	-10	-7	-5	-5	-3	-2	n.m.		
10.0 Corporate profits after taxes (q)	-2	-4	-1	-15	-9	-3	-4	-4	+2	+2		
11.0 Ratio, price/unit labor cost, nonfarm business (q)	n.a.	-7	n.m.	-21	-9	-6	-7	-10	-4	-40		
12.0 Change in consumer installment credit	n.a.	-8	0	-23	-6	n.m.	-14	-1	-2	-6		
<i>Roughly Coincident Indicators</i>												
17.0 Personal income	n.a.	n.m.	0	-4	-1	-5	-9	0	-1	0		
15.0 Gross national product (q)	n.m.	+4	n.m.	-16	-1	-1	-5	-2	-2	+1		
16.0 Industrial production	n.a.	-7	+4	0	-1	-5	+4	+5	+6	+3		

18.0 Manufacturing and trade sales	n.a.	-7	0	0	-9	-2	-3	-4	-1	+3
13.0 Employees on nonfarm payrolls	n.a.	+1	0	+1	+2	0	0	+4	+8	+3
14.0 Unemployment ratio (inverted)	n.a.	n.m.	+3	+1	0	-3	-4	+2	+7	+5
<i>Lagging Indicators</i>										
19.0 Unemployment rate, 15 weeks and over (inverted)	n.a.	n.m.	+7	+7	+3	+5	0	0	+9	+7
20.0 Business expenditures, new plant and equipment, deflated (q)	n.a.	+11	n.m.	+3	+3	n.m.	+5	+5	+11	+14
21.0 Manufacturing and trade inventories	0	+10	+4	-3	+5	+5	+9	+7	+15	+7
23.0 Commercial and industrial loans outstanding	n.a.	+3	+1	+7	+4	n.m.	+2	+9	+18	+9
22.0 Output per hour, percentage change of reciprocal (q)	n.m.	+2	+14	-6	+12	+9	+8	+11	+20	+11
24.0 Prime rate on short-term business loans	n.m.	+10	n.m.	+7	+5	n.m.	+3	+5	+16	+16
<i>Composite Indexes</i>										
Inverted Lagging	n.a.	-11	n.m.	-24	-18	-10	-19	-12	-12	-36
Leading	n.a.	-2	n.m.	-17	-9	n.m.	-3	-1	-1	+3
Roughly Coincident	n.a.	-2	+2	+1	0	-1	-3	0	+8	0
Lagging	n.a.	n.m.	+2	+7	+3	+3	+5	+7	+16	+16

Note:

n.a. = Data not available.

n.m. = No matching turn.

Table 4B-1. continued

	Troughs									
	10/49	7/52	8/54	4/58	2/61	10/64	10/67	11/70	3/75	
<u>Leading Indicators</u>										
1.0 Average workweek, manufacturing	-6	0	-4	-2	-2	-9	-8	-2	0	
2.0 Initial claims, unemployment insurance (inverted)	-6	-11	-5	0	0	-10	-6	-1	0	
4.0 Net business formation	-3	n.m.	-5	0	-1	n.m.	-11	+3	-1	
3.0 New orders, consumer goods and materials	-4	-10	-10	0	-1	n.m.	-7	0	0	
5.0 Contracts and orders, plant and equipment	-6	n.m.	-5	-1	n.m.	-15	-9	-1	+9	
6.0 New building permits, private housing units	-9	-12	-11	-2	-2	+2	-11	-10	0	
7.0 Change in business inventories (q)	+1	n.m.	-9	-2	-3	-2	n.m.	-9	-1	
8.0 Industrial materials price index	-4	n.m.	-10	0	-2	-16	+9	+13	+4	
9.0 Stock price index, 500 S&P common	-4	n.m.	-11	-4	-4	-24	-12	-5	-3	
10.0 Corporate profits after taxes (q)	-5	-2	-9	-2	0	+1	-5	0	-1	
11.0 Ratio, price/unit labor cost, nonfarm business (q)	n.a.	n.m.	-9	-2	0	+1	-14	-9	-7	
12.0 Change in consumer installment credit	-11	-12	-5	-2	+2	n.m.	-8	0	0	
<u>Roughly Coincident Indicators</u>										
17.0 Personal income	0	n.m.	-1	0	-2	-11	0	+11	0	
15.0 Gross national product (q)	+2	n.m.	-2	-1	+1	+2	-4	+10	0	
16.0 Industrial production	0	0	+1	0	0	0	-3	0	0	

18.0	Manufacturing and trade sales	+2	-7	0	0	0	-11	0	0	0
13.0	Employees on nonfarm payrolls	+4	0	0	+1	+2	0	0	+9	+3
14.0	Unemployment ratio (inverted)	0	n.m.	+1	0	+3	+4	0	+1	+2
<i>Lagging Indicators</i>										
19.0	Unemployment rate, 15 weeks and over (inverted)	+1	n.m.	0	+4	+5	+1	+5	+8	+4
20.0	Business expenditures, new plant and equipment, deflated (q)	+1	n.m.	+6	+7	n.m.	-20	+7	+9	+8
21.0	Manufacturing and trade inventories	+4	+1	+6	+4	+4	+15	+15	+20	+9
23.0	Commercial and industrial loans outstanding	+7	+1	+2	+4	n.m.	-14	+9	+16	+26
22.0	Output per hour, percentage change of reciprocal (q)	n.m.	-2	+9	+10	+12	-8	+4	+27	+11
24.0	Prime rate on short-term business loans	+10	n.m.	+11	+4	n.m.	+13	0	+16	+25
<i>Composite Indexes</i>										
	Inverted Lagging	n.a.	n.m.	-15	-7	-9	-26	-11	-13	-8
	Leading	-4	n.m.	-9	-2	-2	n.m.	-6	0	0
	Roughly Coincident	0	0	0	0	0	-11	0	0	0
	Lagging	+6	n.m.	+6	+4	+5	+1	+5	+16	+9

Note:

n.a. = Data not available.
n.m. = No matching turn.

Table 4B-2. Individual Indicators and Composite Indexes, Lead (-) or Lag (+) at Growth Cycle Turning Points, in Months, Canada.

	Peaks									
	4/51	3/53	11/56	10/59	3/62	3/66	2/69	2/74	5/76	9/79
<i>Leading Indicators</i>										
1.0 Average workweek, manufacturing	-3	+2	-11	-5	-3	-3	-3	-16	n.m.	-9
2.0 Initial claims, unemployment insurance (inverted)	+1	+2	-5	-2	-3	-5	+9	-12	+8	0
3.1 New orders, durable goods	n.a.	+10	-14	-3	+3	-1	0	-2	n.m.	-12
5.1 New orders, machinery and equipment	n.a.	n.a.	n.a.	n.a.	+3	+10	+7	+5	+9	n.a.
5.2 Nonresidential building permits	-10	n.m.	-15	-2	-1	+1	+5	+3	+1	n.a.
6.0 Residential building permits	n.a.	n.a.	n.a.	n.a.	n.a.	-16	+10	-3	-3	n.a.
7.0 Change in nonfarm business inventories (q)	-5	+2	0	+4	n.m.	-13	0	+9	-3	-4
8.0 Industrial Materials Price Index	0	n.m.	+2	-1	+2	-1	+4	+2	n.m.	+4
9.0 Stock price index Toronto Stock Exchange	+6	n.m.	-4	-3	-3	-14	+3	-4	n.m.	n.a.
10.0 Corporate profits after taxes (q)	-5	-1	-9	-11	-7	-25	-3	0	n.m.	-1
11.0 Ratio price to unit labor cost, manufacturing	n.a.	n.a.	n.a.	n.a.	n.a.	-27	+1	+3	n.m.	n.a.
12.0 Change in consumer credit outstanding	n.a.	n.a.	n.a.	-4	n.m.	-21	0	-10	+1	n.a.
<i>Roughly Coincident Indicators</i>										
17.0 Personal income (q)	+1	+2	-6	+10	-1	n.m.	0	n.m.	+6	n.m.
15.0 Gross National Exchange (q)	-2	-4	0	+4	-1	-1	0	0	0	-1
16.0 Industrial production	0	0	0	0	+4	-3	+1	0	n.m.	0

18.1 Retail trade	-2	0	-4	-8	n.m.	-3	0	0	+7	-6
13.0 Nonfarm employment	n.a.	n.a.	0	0	+3	+12	+2	+6	n.m.	n.m.
14.0 Unemployment rate (inverted)	n.a.	n.a.	-1	-5	-3	+3	+5	+4	n.m.	n.a.
<i>Lagging Indicators</i>										
19.0 Long term unemployment	n.a.	n.a.	0	+1	+1	+4	+7	+6	-2	n.a.
20.0 Plant and equipment, Real Canadian dollars	n.m.	-1	+3	+4	n.m.	+9	n.m.	+18	n.m.	n.a.
21.0 Business Inventories, Real Canadian dollars	n.a.	-10	+11	+7	0	+10	+21	+10	n.m.	+8
22.1 Percentage change in the inverse of O/MH	n.a.	n.a.	n.a.	n.a.	n.a.	+5	+22	+15	n.m.	n.a.
23.0 Industrial loans in Real Canadian dollars	n.a.	n.a.	+12	-2	+6	-5	+3	-21	+9	n.a.
24.0 Canada Prime Rate	n.a.	n.a.	+12	n.m.	n.m.	n.m.	+5	+8	+3	+1
<i>Composite Indexes</i>										
Lagging index, inverted	-7	-16	-23	-11	-9	-28	-3	-15	n.m.	-19
Leading index	-2	n.m.	-8	-2	-4	-2	+1	+1	n.m.	+4
Roughly coincident index	-2	0	-1	0	0	0	0	0	0	0
Lagging index	n.m.	0	+2	+5	+6	+4	+9	+5	n.m.	+7

Note:

n.a. = Data not available.

n.m. = No matching turn.

Table 4B-2. continued

Leading Indicators	Troughs									
	12/51	10/54	8/58	3/61	5/63	2/68	12/70	10/75	7/77	6/80
1.0 Average workweek, manufacturing	0	-5	-8	-10	+7	-11	+2	-10	n.m.	+1
2.0 Initial claims, unemployment insurance (inverted)	-2	-4	-2	-7	+11	-1	+18	-6	+2	n.m.
3.1 New orders, durable goods	+7	+1	+3	-5	-2	0	-1	-6	n.m.	n.m.
5.1 New orders, machinery and equipment	n.a.	n.a.	n.a.	n.a.	-6	-1	+7	+3	0	n.m.
5.2 Nonresidential building permits	+2	n.m.	-9	+1	+12	-7	+9	-7	0	n.m.
6.0 Residential building permits	n.a.	n.a.	n.a.	n.a.	-7	-14	+22	-11	n.a.	n.a.
7.0 Change in nonfarm business inventories (q)	-1	+1	-6	n.m.	0	-3	+14	-2	+10	n.a.
8.0 Industrial Materials Price Index	n.a.	-2	-3	-2	-7	-11	+12	n.m.	+3	n.a.
9.0 Stock price index Toronto	n.m.	-10	-8	-5	-8	+1	-6	n.m.	+3	n.a.
10.0 Corporate profits after taxes (q)	+5	-5	-9	-1	-3	-9	-1	n.m.	-2	n.a.
11.0 Ratio price to unit labor cost, manufacturing	n.a.	n.a.	n.a.	n.a.	n.a.	-18	0	n.m.	+2	n.a.
12.0 Change in consumer credit outstanding	n.a.	n.a.	-19	+1	n.m.	-21	-11	-11	-2	n.a.
<u>Roughly Coincident Indicators</u>										
17.0 Personal income (q)	-1	+1	0	-1	+15	n.m.	-1	n.m.	n.a.	n.a.
15.0 Gross National Exchange (q)	-1	-5	-6	-1	+3	-3	-1	-5	+1	+2
16.0 Industrial production	0	-3	+1	0	-1	0	0	0	n.m.	+1

18.1 Retail trade	+1	0	+1	-2	n.m.	0	-8	-10	0	0
13.0 Nonfarm employment	n.a.	0	0	0	0	+1	+4	n.m.	+6	n.a.
14.0 Unemployment rate (inverted)	n.a.	-3	-2	+2	0	+4	+4	n.m.	+5	n.a.
<u>Leading Indicators</u>										
19.0 Long term unemployment	n.a.	+1	+1	+3	+1	+5	+23	-5	+14	n.a.
20.0 Plant and equipment, Real Canadian dollars	n.m.	+4	+6	n.m.	-3	+10	n.m.	n.m.	+7	n.a.
21.0 Business Inventories, Real Canadian dollars	n.a.	+11	+3	-2	+10	+4	+32	n.m.	+15	+5
22.1 Percentage change in the inverse of O/MH	n.a.	n.a.	n.a.	n.a.	n.a.	+8	+10	+7	n.m.	n.a.
23.0 Industrial loans in Real Canadian dollars	n.a.	n.a.	+3	+4	+1	-8	+5	-5	+16	n.a.
24.0 Canada Prime Rate	n.a.	+17	n.m.	n.m.	n.m.	-10	+27	-7	+7	+3
<u>Composite Indexes</u>										
Lagging index, inverted	n.m.	-17	-19	-19	-8	-19	-13	-15	n.m.	-2
Leading index	n.m.	-7	-9	-4	-6	-3	+1	n.m.	+2	+2
Roughly coincident index	-1	0	0	-1	+2	0	-1	0	+6	0
Lagging index	n.m.	+2	+4	+3	+1	+9	+23	n.m.	+7	+3

Note:
 n.a. = Data not available.
 n.m. = No matching turn.

Table 4B-3. Individual Indicators and Composite Indexes, Lead (-) or Lag (+) at Growth Cycle Turning Points, in Months, United Kingdom.

	Peaks						Troughs						
	3/51	12/55	3/61	2/66	6/69	6/73	6/79	8/52	11/58	2/63	8/67	2/72	8/75
<i>Leading Indicators</i>													
1.0 Average workweek, manufacturing	n.a.	n.a.	n.a.	-14	-5	+6	+7	n.a.	n.a.	+1	-9	0	-3
4.1 New companies registered	n.a.	-5	-12	-22	-20	-3	n.a.	-1	-6	-13	-10	-28	n.m.
4.2 Business failures (inverted)	n.a.	n.a.	n.a.	-8	-9	0	-1	n.a.	n.a.	-12	-4	-19	-1
5.1 New orders, engineering industries	n.a.	n.a.	-13	-22	-1	+6	-7	n.a.	-5	-2	+2	-8	+4
5.2 New orders, construction, private industry	n.a.	n.a.	-5	-16	-1	+4	+4	n.a.	+1	+13	-3	-9	+3
6.0 Housing starts, thousands	n.m.	-19	-11	-15	n.m.	-6	-6	n.m.	-9	-10	n.m.	-23	-11
7.0 Change in stocks and work in progress (q)	n.a.	n.a.	-4	-15	-10	+14	-4	n.a.	0	-12	+6	0	-6
8.0 Basic materials price index	n.a.	+28	n.m.	+3	-6	+7	n.m.	n.a.	+19	n.m.	-1	+8	-2
9.0 Common stock price index	+1	-5	+1	-26	-5	-10	n.m.	-2	-9	-7	-9	-20	-8
10.0 Companies' profits less U.K. taxes (q)	n.a.	n.a.	-13	-27	+2	-4	-1	n.a.	-3	0	0	-3	-3
11.0 Ratio, price to unit labor cost, manufacturing	n.a.	n.a.	n.a.	-15	-14	+9	-22	n.a.	n.a.	n.a.	-9	-12	+1
12.0 Increase in hire purchase debt	n.a.	n.a.	-19	-16	-19	-5	0	n.a.	n.a.	-11	-10	-27	-19

Roughly Coincident Indicators

17.0 Personal disposable income (q)	n.a.	-7	+2	0	-14	-1	-10	n.a.	0	-9	-6	-3	+21
15.0 Gross domestic product (q)	n.a.	n.a.	-1	-21	-10	-4	-13	n.a.	+3	0	-7	+6	0
16.0 Industrial production	0	-7	-12	-14	0	0	0	0	-1	-1	0	0	0
18.1 Retail sales	n.a.	n.a.	-11	+3	-15	-3	0	n.a.	-6	0	-9	-1	+22
13.0 Employment in production industries	n.a.	+1	+1	-1	+6	+14	+2	+2	+2	0	+8	+1	+6
14.0 Unemployed (inverted)	+2	0	0	0	+14	+6	+6	+3	0	+1	0	+1	+6

Lagging Indicators

19.0 Long-term unemployment, inverted	+6	+3	0	+5	+13	+10	+7	+7	+4	+2	-1	+2	+8
20.0 Investment in plant and equipment	n.a.	n.a.	+5	0	+17	+17	+5	n.a.	+9	+9	+3	+6	+6
21.0 Changes in stock and work in progress	n.a.	+17	+2	-6	+14	+14	+5	n.a.	+6	+6	+6	+9	+9
22.0 Changes in employment per unit output	n.a.	n.a.	+8	+9	+11	+8	n.m.	n.a.	n.a.	+12	+6	+12	+15
23.0 Loans to industry	n.a.	n.a.	+2	0	+5	+14	n.m.	n.a.	-9	+15	+12	0	n.m.
24.0 Prime rate	n.a.	n.a.	n.a.	n.a.	+3	+5	+9	n.a.	n.a.	n.a.	-1	+3	-4

Composite Indexes

Lagging index, inverted	n.a.	-18	-26	-30	-22	-14	-39	n.a.	-33	-19	-13	-30	-15
Leading index	n.a.	n.a.	-12	-15	-10	-3	+5	n.a.	-5	-11	-9	-11	-1
Coincident index	n.a.	0	0	0	-1	+14	0	0	0	0	+3	0	+3
Lagging index	n.a.	+3	0	+5	+13	+8	+10	n.a.	+4	+9	+10	+2	+8

Note:

n.a. = Data not available.
n.m. = No matching turn.

Table 4B-4. Individual Indicators and Composite Indexes, Lead (-) or Lag (+) at Growth Cycle Turning Points, in Months, West Germany.

Leading Indicators	Peaks					Troughs							
	2/51	10/55	2/61	5/65	5/70	8/73	2/80	2/54	4/59	2/63	8/67	12/71	5/75
1.1 Number working short hours, inverted	n.a.	0	-17	+10	-27	-1	-43	-41	-6	+1	-2	0	+3
2.0 Applications for unemployment compensation, inverted	n.a.	n.a.	n.a.	+10	+6	-7	-2	n.a.	-13	n.m.	-2	+2	-4
4.1 Insolvent enterprises, inverted	n.a.	n.a.	n.a.	+4	-22	-8	-9	n.a.	n.a.	n.a.	-4	-14	-4
5.1 New orders, investment goods industrial	n.a.	n.a.	n.a.	-4	-9	-3	-14	n.a.	n.a.	0	-7	0	+3
Housing permits, interior space	n.a.	n.a.	n.a.	+10	n.a.	n.a.	n.a.	n.a.	n.a.	+8	-3	n.a.	n.a.
6.1 Residential construction orders	n.a.	n.a.	n.a.	n.a.	n.a.	-18	-15	n.a.	n.a.	n.a.	n.a.	n.a.	-6
7.0 Inventory change	n.a.	+27	-5	-4	-5	+4	-4	n.a.	-1	+2	-5	-8	+4
9.0 Stock price index	n.a.	n.a.	-6	-9	-6	-5	-47	n.a.	-22	0	-8	-13	-8
10.1 Net income from entrepreneurial activities	n.a.	n.a.	-6	0	-10	-3	n.m.	n.a.	-2	-12	+3	-22	-15
11.0 Ratio, price to unit labor cost	n.a.	n.a.	-9	-9	-9	-9	n.m.	n.a.	n.a.	+3	-6	-10	-12
12.0 Change in consumer credit	n.a.	n.a.	n.a.	n.a.	n.a.	-9	-33	n.a.	n.a.	n.a.	n.a.	-19	-18

Roughly Coincident Indicators

17.0 Disposable income (real)	-6	-5	0	0	n.m.	-9	-9	-27	+10	+3	+6	n.m.	+24
15.0 Gross national product (real)	0	+7	0	+9	0	-6	0	0	-2	0	0	+8	0
16.0 Industrial production	0	0	0	-4	-1	0	-7	+1	+3	0	+3	0	+2
18.1 Manufacturing sales	n.a.	n.a.	-2	-4	-6	-7	+3	n.a.	-1	0	+5	0	-2
18.2 Retail trade	n.a.	+18	+9	-1	n.m.	-12	-9	n.a.	+11	+4	+5	n.m.	-5
13.1 Employment in mining and manufacturing	n.a.	+1	+1	+11	+3	+3	n.m.	-3	+1	+9	+3	+9	+8
14.0 Unemployment rate	n.a.	+4	0	+10	+4	+1	+2	+6	-2	0	-3	+5	+1

Lagging Indicators

20.0 Investment in machinery, equipment, and construction	n.a.	n.a.	n.a.	+9	+3	-6	-36	n.a.	n.a.	0	-3	-1	0
21.0 Level of inventories	n.a.	+28	n.m.	+12	+3	+18	n.m.	n.a.	n.a.	+15	+18	+17	+9
23.1 Bank credits to the economy	n.a.	n.a.	n.a.	-21	-24	-8	n.a.	n.a.	n.a.	n.a.	+4	-9	-1
22.0 Percentage change in the reciprocal of output/manhour	n.a.	n.a.	n.a.	+16	0	+11	n.m.	n.a.	n.a.	n.a.	-2	+6	+3
24.1 Bank rates on large loans	n.a.	n.a.	n.a.	n.a.	0	+3	n.m.	n.a.	n.a.	n.a.	+18	+6	+36

Composite Indexes

Lagging index, inverted	n.a.	n.a.	n.a.	n.a.	-35	-12	-12	n.a.	n.a.	n.a.	n.m.	-18	-18
Leading index	n.a.	n.a.	-6	-4	-9	-7	-9	n.a.	-2	+2	-2	-4	-6
Roughly coincident index	0	0	0	-1	+2	-6	0	-27	-2	0	0	+7	+3
Lagging index	n.a.	n.a.	n.a.	+9	+1	+3	+3	n.a.	n.a.	n.a.	-2	+8	+4

Note:

n.a. = Data not available.

n.m. = No matching turn.

Table 4B-5. Individual Indicators and Composite Indexes, Lead (-) or Lag (+) at Growth Cycle Turning Points, in Months, France.

	Peaks					Troughs					
	8/57	2/64	6/66	11/69	5/74	8/79	8/59	6/65	5/68	11/71	6/75
<i>Leading Indicators</i>											
1.0 Average workweek, manufacturing	n.a.	-1	+1	-6	-13	n.m.	n.a.	-2	-4	-14	+4
6.0 Building permits, residential	-21	-5	-6	-11	-9	n.m.	-21	-12	-7	+4	-5
8.0 Wholesale price index, raw materials	+3	n.m.	0	+5	-1	+1	-9	n.m.	+5	+9	+4
9.0 Index of stock prices	-1	-23	-5	+2	-12	+1	-13	-12	-10	-1	-9
11.0 Ratio, price to unit labor cost, manufacturing (q)	n.a.	-37	-4	+3	-3	-5	-16	-15	-3	+4	-3
3.1 Change in unfilled orders, total	n.a.	n.a.	n.a.	-11	-13	-10	n.a.	n.a.	n.a.	-16	-8
<i>Roughly Coincident Indicators</i>											
15.0 Gross Domestic Production (q)	n.a.	-6	-1	-12	0	0	n.a.	-4	0	-6	-4
16.0 Industrial production	-10	+2	0	-12	+3	-1	-6	-3	0	-6	-1
18.1 Retail sales	0	+14	n.m.	-12	-4	n.m.	0	n.m.	0	+12	0
13.0 Employment, nonfarm	+5	+8	+1	+8	0	+8	+20	+6	+3	+9	+7
14.0 Registered unemployed (inverted)	-4	0	+3	0	0	-19	+2	0	+1	0	+3
<i>Lagging Indicators</i>											
21.1 Inventory of finished goods, survey, change over four months	n.a.	n.a.	n.a.	+9	+6	n.m.	n.a.	n.a.	+1	+15	+4
24.0 Commercial banks, prime rate	n.a.	n.a.	n.a.	-1	+7	+6	n.a.	n.a.	+1	+9	+8
<i>Composite Indexes</i>											
Lagging index, inverted	n.a.	n.a.	n.a.	-17	-18	-44	n.a.	n.a.	n.a.	-20	-7
Leading index	-1	-5	-4	-2	-11	-2	-16	-12	-4	+4	-4
Roughly coincident index	-2	+2	0	-12	0	0	-1	-3	0	+3	0
Lagging index	n.a.	n.a.	n.a.	+4	+6	n.m.	n.a.	n.a.	+1	+12	+6

Note: n.a. = Data not available; n.m. = No matching turn.

Table 4B-6. Individual Indicators and Composite Indexes, Lead (-) or Lag (+) at Growth Cycle Turning Points, in Months, Italy.

	Peaks						Troughs					
	10/56	9/63	8/69	4/74	12/76	2/80	7/59	3/65	9/72	5/75	10/77	
<i>Leading Indicators</i>												
1.1 Hours per month per worker in industry	n.a.	n.a.	n.a.	-3	0	+1	n.a.	n.a.	+4	+3	+19	
4.1 Declared bankruptcies (inverted)	+2	-5	-2	-6	n.m.	n.m.	-7	-2	-11	n.m.	n.m.	
3.1 Change in unfilled orders, total	n.a.	n.a.	-8	-9	-8	-14	n.a.	-11	-26	-6	-7	
6.0 Building permits, residential	n.a.	-2	n.m.	-4	+5	0	n.a.	-2	n.m.	-5	+12	
9.0 Stock price index	-13	-36	+8	0	n.m.	n.m.	-12	-7	-10	n.m.	+2	
<i>Roughly Coincident Indicators</i>												
15.0 Gross Domestic Product (q)	+4	+5	-3	-2	+2	0	-8	-1	-1	0	+1	
16.0 Industrial production	-3	0	-1	0	0	0	0	0	-14	0	+10	
18.1 Retail sales	0	-2	0	-5	n.m.	n.a.	-13	0	-13	-1	n.a.	
13.0 Nonfarm employment	n.a.	+4	+11	+9	-5	n.a.	+9	+10	+4	+8	0	
14.0 Unemployment rate (inverted)	n.a.	+1	+18	0	n.a.	n.a.	n.a.	+16	+7	n.a.	-3	
<i>Lagging Indicators</i>												
21.1 Inventory of finished goods, survey, change over 4 months	n.a.	n.a.	+10	+8	+3	+3	n.a.	n.a.	+4	+5	+14	
24.0 Commercial banks, prime rate	n.a.	n.a.	+11	+3	-2	n.m.	n.a.	n.a.	+9	+8	+23	
<i>Composite Indexes</i>												
Lagging index, inverted	n.a.	n.a.	-5	-15	-13	-14	n.a.	n.a.	-24	-5	-7	
Leading index	n.a.	-35	0	-9	n.a.	n.m.	-12	-2	-10	n.a.	+6	
Coincident index	n.a.	+1	+7	0	0	0	n.a.	+10	+6	0	0	
Lagging index	n.a.	n.a.	+13	+8	+3	n.m.	n.a.	+48	+4	+6	+14	

Note: n.a. = Data not available; n.m. = No matching turn.

Table 4B-7. Industrial Indicators and Composite Indexes, Lead (-) or Lag (+) at Growth Cycle Turning Points, in Months, Belgium.

	Peaks					Troughs			
	10/64	9/70	7/74	6/79	7/88	7/71	10/75		
<u>Leading Indicators</u>									
1.1 Monthly hours working	-8	-5	-3	+1	-1	+12	-2		
4.1 Bankruptcies, inverted	n.a.	n.m.	-1	0	-8	n.m.	+2		
3.1 Real inland orders	+22	-8	-2	+4	-1	+5	+7		
9.1 Industrial share price index	-9	-16	-13	+8	-18	-14	-10		
6.1 Number of residential building permits	n.a.	-14	0	n.a.	-5	-2	-5		
5.2 Number of nonresidential building permits	+14	-14	-4	n.a.	-2	-2	n.m.		
<u>Roughly Coincident Indicators</u>									
15.0 Real Gross Domestic Product	n.a.	0	0	-34	+1	0	+1		
16.0 Industrial production	-7	-14	-1	0	-15	-2	-6		
18.1 Real retail sales	+14	n.m.	-17	-17	n.a.	-11	-11		
14.0 Unemployment rate, inverted	-1	+7	-2	n.a.	-1	+15	-1		
<u>Lagging Indicators</u>									
21.1 Finished goods, inventories, change over 4 months	n.a.	+15	+13	+23	+16	+27	+15		
24.1 Bank lending rates to prime borrowers	+20	-12	0	+9	+4	+14	+3		
<u>Composite Indexes</u>									
Lagging index, inverted	n.m.	n.m.	-22	-10	-18	n.m.	-9		
Leading index	n.a.	-14	-6	+4	-5	-3	0		
Roughly coincident index	-7	+3	-6	-7	-2	+12	+1		
Lagging index	+27	-1	+6	+11	+3	+14	+4		

Note: n.a. = Data not available; n.m. = No matching turn.

Table 4B-8. Individual Indicators and Composite Indexes, Lead (-) or Lag (+) at Growth Cycle Turning Points, in Months,

Table 4B-8. Individual Indicators and Composite Indexes, Lead (-) or Lag (+) at Growth Cycle Turning Points, in Months, Netherlands.

	Peaks					Troughs										
	7/50	10/56	3/61	11/65	11/70	8/74	9/76	12/79	6/52	5/58	2/63	8/67	8/72	7/75	11/77	
<i>Leading Indicators</i>																
1.1 Temporary short-time workers (inverted)	n.a.	n.a.	-1	+7	-1	-10	n.m.	0	n.a.	n.a.	0	-4	-5	+2	n.m.	
3.1 Change in unfilled orders	n.a.	n.a.	n.a.	+6	-7	-5	n.m.	n.m.	n.a.	n.a.	-16	-10	-17	0	n.m.	
4.1 Bankruptcies, inverted	n.a.	-8	+4	+3	-23	-20	n.m.	-14	-5	+16	+3	0	-8	-5	n.m.	
5.1 Nonresidential building permits (q)	n.a.	-29	-16	+18	-3	-6	+8	-4	n.a.	-6	-3	+30	-3	-5	+6	
6.1 Dwellings started	n.a.	+3	-1	-11	n.m.	-22	+2	n.m.	-12	-7	-10	-9	n.m.	-9	+3	
7.0 Change in industrial inventories (q)	n.a.	n.a.	-1	n.m.	n.m.	+6	+5	n.m.	n.a.	+3	-12	n.m.	+9	+7	+3	
8.1 Prices, raw materials and semi-manufactured goods	+9	+7	-7	+7	-4	-4	-5	n.m.	+19	+14	0	+16	+8	-1	+13	
9.0 Stock price index	n.a.	-13	+1	-13	-21	-16	-7	-15	+15	-5	-4	-8	-9	-8	-13	
11.0 Ratio, price to labor cost, (q)	n.a.	n.a.	+8	-6	0	-6	+2	-4	n.a.	n.a.	+9	+21	+6	+1	+6	
<i>Roughly Coincident Indicators</i>																
13.1 Employment, manufacturing (q)	+7	+10	+14	0	0	0	0	n.m.	n.m.	+2	+9	+6	+6	+3	n.m.	+3
14.1 Registered unemployed, number (inverted)	n.a.	-5	0	+1	+3	-9	n.m.	0	n.a.	0	0	0	-6	+7	n.m.	
16.0 Industrial production	0	+4	-3	-20	-8	0	0	-8	+6	-1	0	-3	-8	0	0	
18.1 Manufacturing sales (q)	n.a.	-2	-7	0	0	0	-1	-1	-7	+3	0	+3	0	+1	0	
18.2 Retail sales	n.a.	0	0	0	0	-2	n.m.	-22	n.a.	-1	-12	+18	0	0	n.m.	

(Table 4B-8. continued overleaf)

Table 4B-8. continued

	Peaks					Troughs									
	7/50	10/56	3/61	11/65	11/70	8/74	9/76	12/79	6/52	5/58	2/63	8/67	8/72	7/75	11/77
<i>Lagging Indicators</i>															
19.0 Long-term unemployed (inverted), (q)	n.a.	+4	+11	+6	+6	-6	n.m.	+2	n.a.	+9	0	+3	+3	+4	n.m.
20.0 New plant equipment expenditures (q)	n.a.	n.a.	+2	n.m.	+3	0	+11	n.a.	n.a.	0	0	n.m.	0	+7	+15
21.1 Industrial inventories (end of q)	n.a.	+14	+6	-5	-8	+7	+6	n.m.	n.a.	+28	+10	+16	+10	+8	+10
<i>Composite Indexes</i>															
Inverted lagging index	n.a.	n.a.	-31	n.m.	-33	n.m.	-7	-10	n.a.	n.a.	-21	-13	n.m.	n.m.	-9
Leading index	n.a.	-13	-1	-12	-3	-4	+5	+2	+20	-6	0	-9	-9	+2	+3
Roughly coincident index	+1	-1	0	0	+2	0	0	+2	0	0	0	+3	+3	0	+9
Lagging index	n.a.	n.a.	+2	+8	-3	0	+5	+2	n.a.	+3	0	+6	0	+7	+15

Note:

n.a. = Data not available.

n.m. = No matching turn.

Table 4B-9. Individual Indicators and Composite Indexes, Lead (-) or Lag (+) at Growth Cycle Turning Points, in Months, Sweden.

	Peaks			Troughs		
	2/65	7/70	6/74	7/67	7/72	7/78
<i>Leading Indicators</i>						
1.1 Number of hours worked (in industry)	-11	0	+4	-12	0	0
2.1 Number of new job offerings	+10	-6	+4	+8	-6	-5
3.1 Value of new orders, constant prices	-3	-12	-4	+2	0	-12
6.1 Number of housing starts	-	-	-	-	-	-
8.0 Raw material prices	n.a.	-3	+5	+16	+1	-3
9.0 Stock price	+11	-14	-18	+7	-20	-7
11.0 Ratio, price to ULC	-3	+7	+8	+7	-2	-11
12.1 New loans to households	n.a.	+19	-2	n.a.	+9	-19
<i>Coincident Indicators</i>						
13.0 (Nonfarm) employment	+5	-7	+8	-4	+6	n.m.
14.0 Unemployment rate	0	-1	+29	+1	-8	0
15.0 Gross Domestic Product	n.a.	+1	-1	n.a.	-8	-8
16.0 Industrial production index	-1	0	0	0	0	-1
17.0 Disposable income, 1975 prices	0	0	+11	-5	-2	n.m.
18.1 Retail sales, volume	+3	+4	+2	+16	+4	-2
<i>Lagging Indicators</i>						
19.0 Long duration unemployment rate, inverted	+3	+4	+32	+4	+4	+4
22.1 O/MH, 12-month span, inverted	-7	-3	+6	+17	+11	+5
23.1 Personal loans on checking accounts	+18	-12	0	+1	+8	+6
24.1 Discount rate	+16	+7	+2	+18	+20	+11
<i>Composite Indexes</i>						
Inverted lagging index	-24	n.m.	-6	-27	n.m.	-20
Leading index	0	-6	-2	+9	0	-5
Roughly coincident index	0	0	-1	0	-2	-1
Lagging index	+21	-12	-1	+3	+17	+9

Note:

n.a. = Data not available.

n.m. = No matching turn.

Table 4B-10. Individual Indicators and Composite Indexes, Lead (-) or Lag (+) at Growth Cycle Turning Points, in Months, Japan.

	Peaks						Troughs						
	12/53	5/57	1/62	7/64	6/70	11/73	2/80	6/55	1/59	1/63	2/66	1/72	3/75
<i>Leading Indicators</i>													
1.1 Index of overtime workers manufacturing	n.a.	-4	-3	-4	-4	-5	-36	-9	-7	-3	-5	-2	0
4.1 Business failures (inverted)	n.a.	-5	-8	-15	-12	-9	-14	n.a.	-18	-11	-16	-13	-14
5.0 New orders, machinery and construction works	n.a.	n.a.	-6	-3	-8	-4	n.m.	n.a.	n.a.	-6	+2	-3	+4
6.1 Dwelling units started	0	-14	-9	-12	-12	-8	-15	-8	+5	-11	+10	-11	-2
7.0 Change in inventories (q)	-7	-3	-5	+4	-1	+3	+3	-10	-2	-5	-6	+1	-1
8.0 Raw materials price index	+3	0	-5	n.m.	-3	+3	0	+6	-1	n.m.	-7	+6	+8
9.0 Stock price index	n.a.	-4	-6	-15	-5	-10	-13	-1	-13	-3	-7	-2	-5
10.0 Operating profits, all industries (q)	n.a.	-13	-33	-15	-5	-7	-1	-15	-11	-9	-11	0	-2
11.0 Ratio, price to unit labor cost, manufacturing	-2	0	-23	-8	-5	+2	+2	-10	-2	-1	-4	0	0
12.1 Change in consumer and housing credit outstanding (q)	n.a.	n.a.	n.a.	n.a.	-7	-9	-12	n.a.	n.a.	n.a.	n.a.	+1	-13
<i>Coincident Indicators</i>													
17.1 Wage and salary income	-20	n.m.	-5	0	n.m.	-9	-12	n.m.	+8	0	+2	n.m.	-13
15.0 Gross national expenditures (q)	n.a.	+3	-2	-5	-7	-9	n.m.	-7	+1	-2	-3	-2	-1
16.0 Industrial production	-2	0	0	-5	0	+3	0	0	-7	-1	0	0	0

18.1 Retail sales	n.a.	-10	n.m.	-8	+14	0	-19	0	-8	n.m.	-1	+3	-11
13.0 Regular workers' employment, all industries	n.a.	0	+4	+4	0	n.m.	n.m.	+9	-2	+2	+13	n.m.	+1
14.0 Unemployment rate (inverted)	0	+1	-10	+8	-3	+1	0	+1	+2	+2	+7	-1	+7
<i>Lagging Indicators</i>													
20.0 Gross fixed capital formation (others)	+2	0	-5	+1	-4	0	n.m.	-1	+1	+7	0	+7	+8
21.0 Inventory level	n.a.	n.a.	+4	+4	+2	+9	n.m.	n.a.	n.a.	+1	+9	+1	+50
23.1 Commercial bank loans and discounts	n.a.	+16	n.m.	-1	n.m.	-11	-14	+11	n.m.	-10	+50	n.m.	-7
24.1 Contracted rate on loans	n.a.	+12	+9	+7	+4	n.m.	+6	+19	+29	+8	+18	+14	n.m.
22.1 Output/manhour, percentage change of reciprocal, 12-month span	n.a.	n.a.	+7	+9	+7	+8	n.m.	n.a.	n.a.	+5	+7	+10	+14
<i>Composite Indexes</i>													
Lagging index, inverted	n.a.	-9	-29	-13	-46	-14	-12	n.a.	-17	-8	-15	-14	-8
Leading index	-2	-4	-5	-9	-4	+3	0	-10	-7	-3	-6	+1	-1
Roughly coincident index	n.a.	0	-5	0	-7	-1	0	0	0	0	+1	+3	-1
Lagging index	n.a.	+3	+4	+4	+5	+8	+6	+14	+7	+5	+7	+8	+47

Note:

n.a. = Data not available.

n.m. = No matching turn.