

Growth Cycle Signals as Inflation  
Indicators for Major Industrial Nations

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## 1. INTRODUCTION

Prospects for slower economic growth or a recession in 1989-90, together with the outlook for inflation, have been receiving much attention in recent months. One of the issues of concern to forecasters is whether leading indicators of the real economy, which are now issued in many countries, have a bearing on the future of inflation. Doubtless a direct approach, which would involve the development of leading indicators specifically related to inflation, would be preferable. However, we are aware of only one such index currently available, the leading index of inflation compiled for the United States by the Center for International Business Cycle Research. Hence in this paper we explore whether leading and coincident indexes measuring real growth are useful for forecasting inflation in the U.S., the United Kingdom, West Germany and Japan.

Section 2 shows how growth cycles and inflation cycles are related in these countries, using results from a recent study by Moore and Philip Klein for the World Bank. Section 3 explains the development of signals of turning points in inflation rate cycles using the growth rates in the leading and coincident indexes. It shows the leads and lags of the signal system at inflation cycle turns, and measures the magnitude of changes in the inflation rate between the growth signal dates. Section 4 discloses how the new signals could be of use in forecasting changes in interest rates. Section 5 provides a summary of the principal findings.

## 2. RECESSIONS SLOW INFLATION.

Experience provides strong support for the statement that significant declines in the rate of inflation usually accompany economic slowdowns or recessions. The statement holds not only for the United States, but also for Britain, West Germany, Canada,

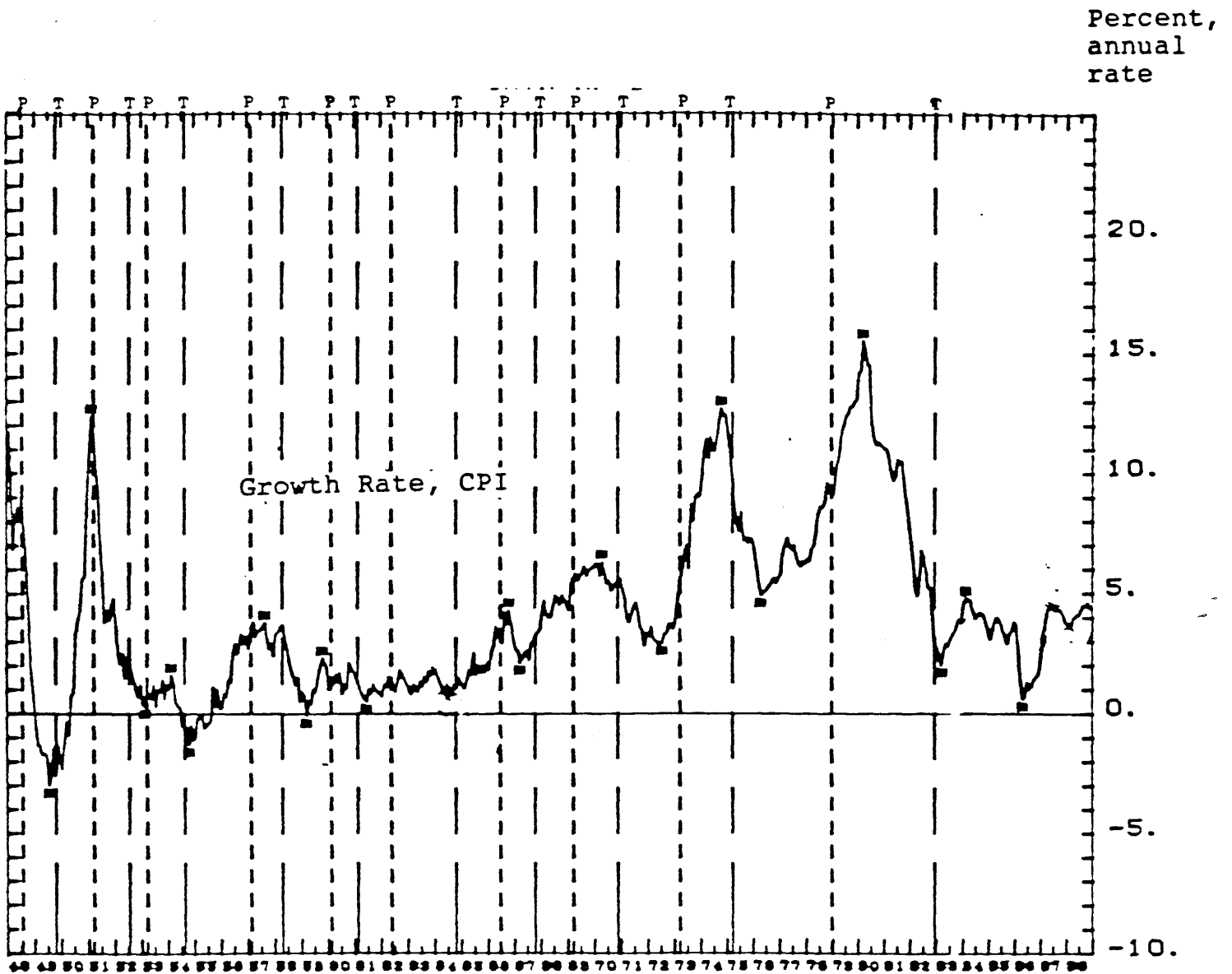
Japan, and other industrialized economies. Taking all five countries listed above together, there have been 39 instances of slowdown or recession in economic growth from 1950 to the present, and in 34 of these cases, or 87 percent, significant declines in inflation rates occurred. Simply put, there is a high degree of correspondence between the economic slowdowns and declines in inflation.

The current long expansion in economic activity in the U.S. has led to a revival of the view that economic policymakers can control monetary and fiscal policies so precisely that they can engineer what are now fashionably called "soft landings" for the economy. That is, they are able to bring about slowdowns in economic growth which reduce the inflation rate but which do not lead the economy into a full-fledged recession. Whether the state of the art is such that policymakers can accomplish this feat is debatable. However, if such expertise does exist, serious students of cyclical fluctuations would plainly have to focus more of their attention on what are called "growth cycles." These are alternating periods of growth at greater than or less than the long-run average or trend rate of growth. These growth cycles are measured by taking the deviations from trend of comprehensive measures of economic activity. The CIBCR has used these deviations from trend to construct growth cycle chronologies for the major industrialized economies.

To show the relation between growth cycles and inflation cycles the latter are defined by the peaks and troughs in a six-month smoothed rate of change in the consumer price index. The six-month smoothed rate is obtained by dividing the current month's CPI (seasonally adjusted) by the average CPI for the preceding twelve months and raising this to an annual rate. Charts 1-4 show these rates for the United States, the United Kingdom, West Germany, and Japan, together with the peak and trough dates. For the four countries, downswings in the smoothed rate of change in these prices occurred in virtually every period of slow growth or recession, and quickening inflation generally occurred in periods of rapid growth. However, the peaks and

CHART 1

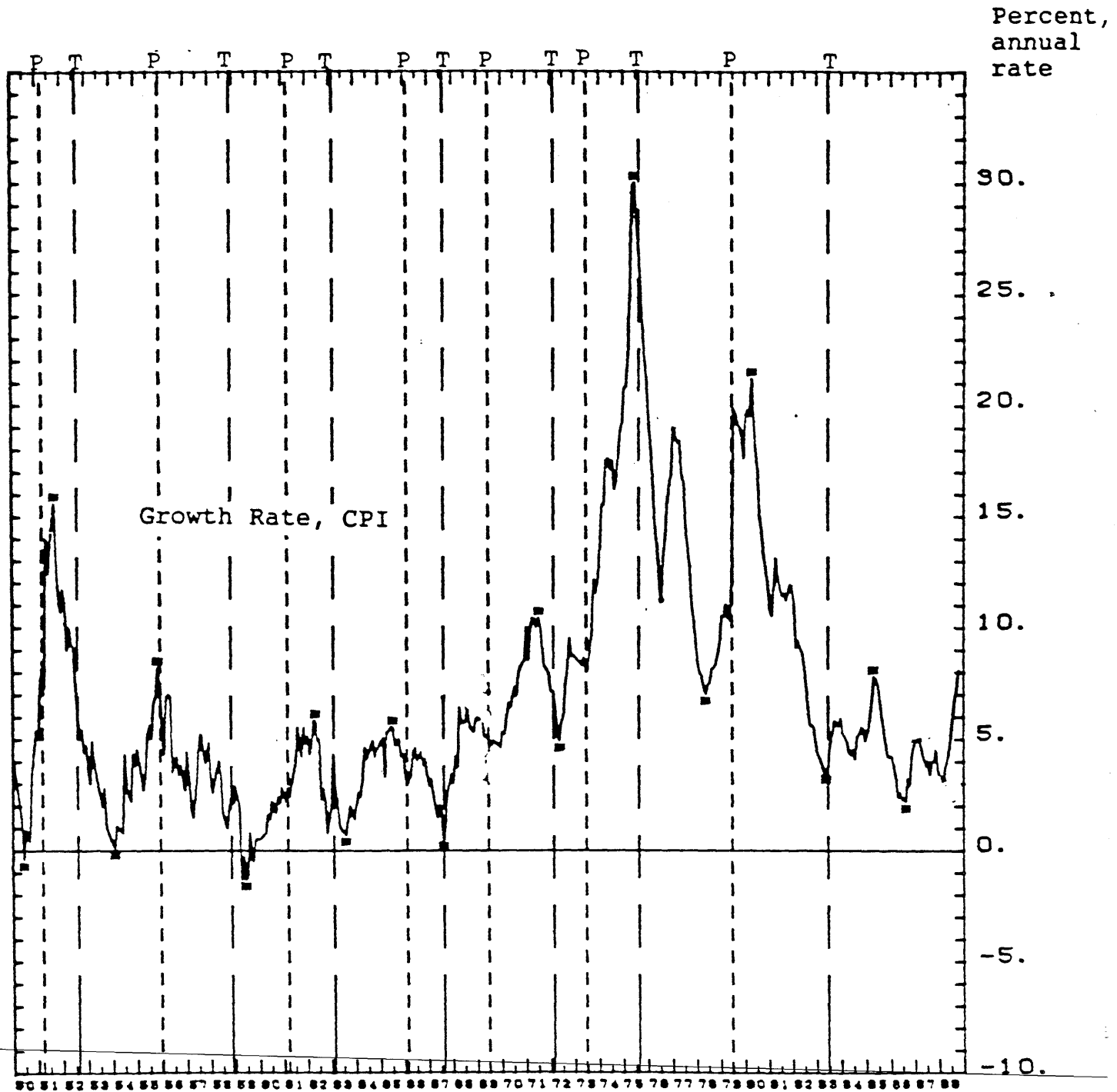
UNITED STATES: INFLATION RATE AND GROWTH CYCLE CHRONOLOGY



Vertical lines are growth cycle peaks (---) and troughs (—).

CHART 2

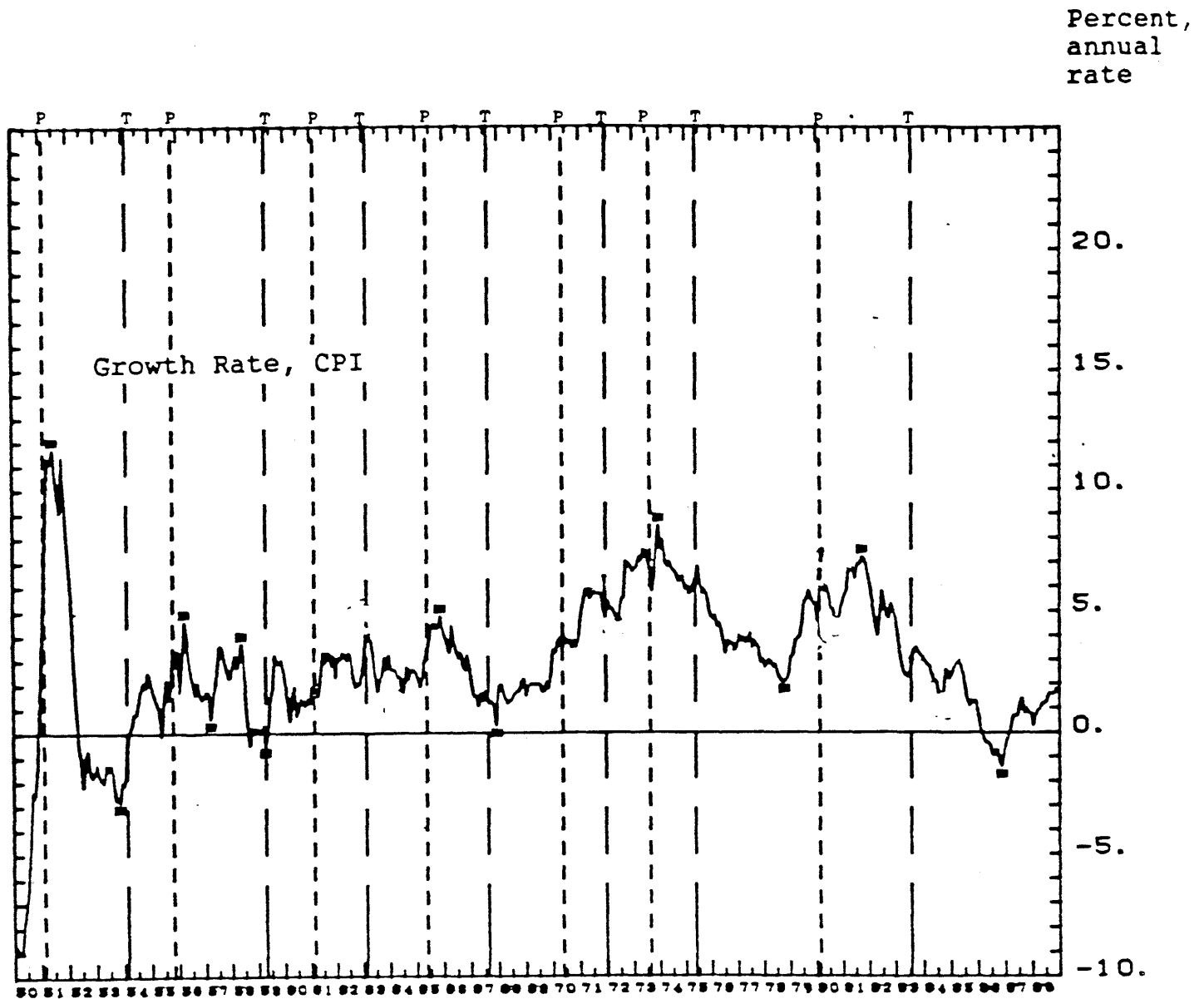
UNITED KINGDOM: INFLATION RATE AND GROWTH CYCLE CHRONOLOGY



Vertical lines are growth cycle peaks (---) and troughs (—).

CHART 3

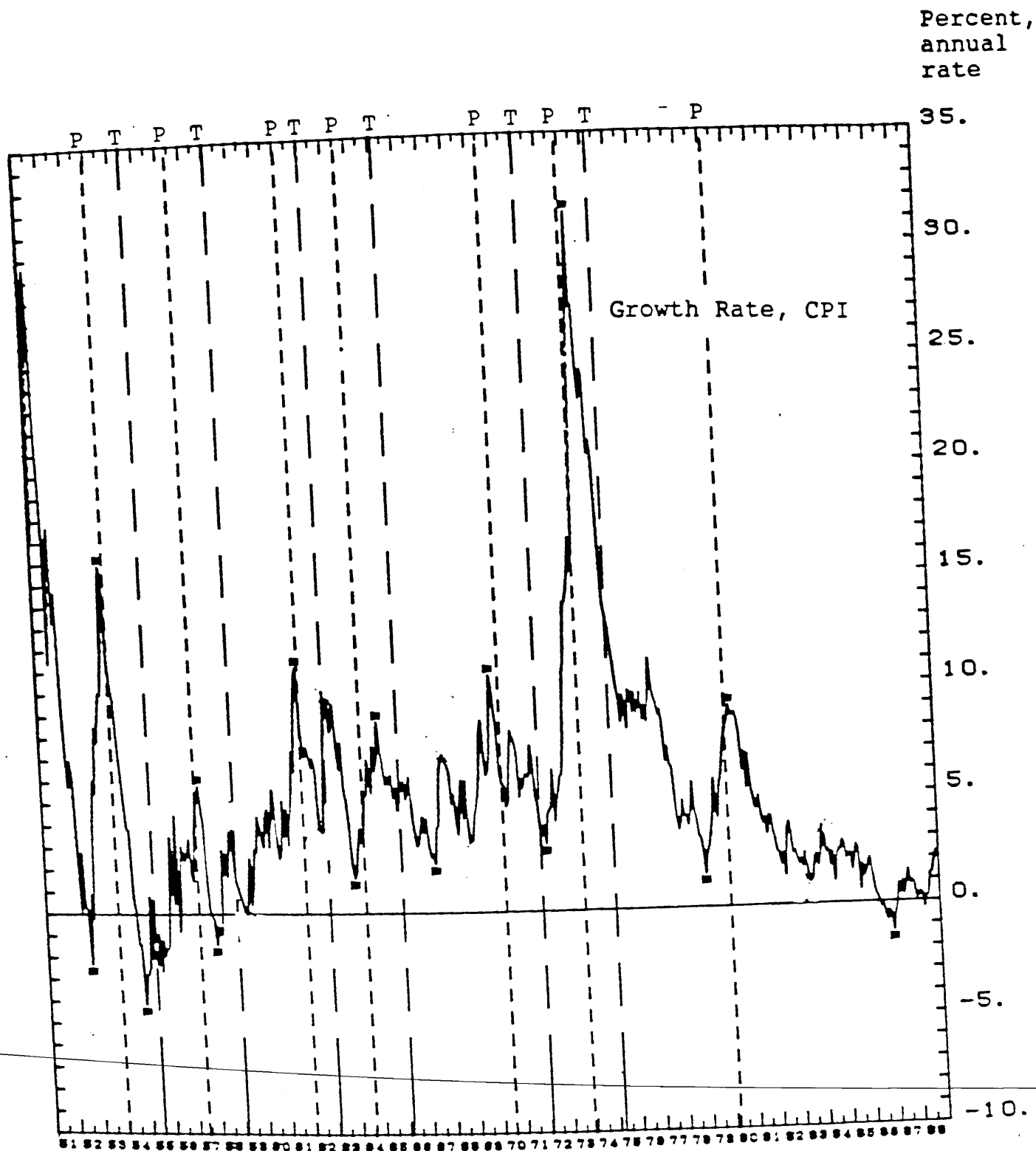
WEST GERMANY: INFLATION RATE AND GROWTH CYCLE CHRONOLOGY



Vertical lines are growth cycle peaks (---) and troughs (—).

CHART 4

JAPAN: INFLATION RATE AND GROWTH CYCLE CHRONOLOGY



Vertical lines are growth cycle peaks (---) and troughs (—).

troughs in the inflation rate have on average lagged behind the growth cycle highs and lows. For the U.S., the U.K., West Germany, and Japan, the lags at growth cycle peaks and troughs averaged 5 months, 10 months, 12 months, and 5 months, respectively.

### 3. FORECASTING INFLATION RATE TURNING POINTS.

In this section, we develop a system for anticipating turning points in inflation rates based on signals from the CIBCR leading and coincident indexes. The logic behind the signal system is simple. When economic growth slows down or an actual decline in economic activity occurs, inflation rates typically decline. Leading and coincident indexes are designed to provide advance and current information about slowdowns and downturns in economic activity. Thus, when their growth is subpar, this should also be useful as a signal of future declines in inflation rates.

Table 1 provides information about turning points in the inflation cycles and growth cycle signals for the U.S. The growth cycle signals are based on a plus and minus band of 0.5 percentage points around the 2.7 percent average annual growth in the U.S. leading and coincident indexes from 1976 to 1986. The initial signal of a growth slowdown (P1) occurs when the leading index growth rate goes below 2.2 percent. The final signal of slowdown (P2) is set off when the coincident index growth rate also falls below 2.2 percent. For growth speedups, the initial signal (T1) is registered when the growth rate of the leading index goes above 3.2 percent; the final signal of speedup (T2) is triggered when the coincident index growth rate also goes above 3.2 percent. Rules are also established on how and when to cancel false signals.

The average lead of the initial signal over the inflation cycle was 8 months at peaks and 5 months at troughs. The lead of the second signal was on average 2 months at peaks and 1 month at troughs. Taking peaks and troughs together, the average leads of the initial and final signals were 7 and 2 months, respectively.



TABLE 1

## INFLATION CYCLE TURNS AND GROWTH CYCLE SIGNALS, UNITED STATES

INFLATION CYCLE CHRONOLOGY		INITIAL GROWTH CYCLE SIGNALS		LEAD(-) OR LAG(+) IN MONTHS		FINAL GROWTH CYCLE SIGNALS		LEAD(-) OR LAG(+) IN MONTHS	
TROUGH	PEAK	T1	P1	T1	P1	T2	P2	T2	P2
7/49		11/49		+4		2/50		+7	
	2/51		4/51		+2		6/52		+16
3/53		8/52		-7		8/52		-7	
	10/53		6/53		-4		8/53		-2
10/54		6/54		-4		12/54		+2	
	8/57		1/56		-19		6/56		-14
3/59		7/58		-8		10/58		-5	
	10/59		8/59		-2		9/59		-1
6/61		4/61		-2		8/61		+2	
	10/66		5/66		-5		5/67		+7
5/67		7/67		+2		8/67		+3	
	2/70		5/69		-9		11/69		-3
6/72		12/70		-18		12/71		-6	
	9/74		8/73		-13		12/73		-9
6/76		7/75		-11		11/75		-7	
	3/80		1/79		-14		4/79		-11
3/83		12/82		-3		5/83		+2	
	2/84		7/84		+5		n.s.		
4/86		9/85		-7		n.s.			
FALSE SIGNALS		11/62	6/62			2/87	8/86		
		3/78	1/78						
		11/80	8/81						
		12/86	8/86						
		8/88	4/88						
AVERAGE:	P, T			-5	-7			-1	-2
	P&T				-6				-2
PERCENT LEADS:	P, T			80	78			44	75
	P&T				79				59

Note: Inflation cycle turns are based on the CPI inflation rate (SM6). Signals are based on the IEI leading (L) and coincident (C) growth rates (SM6). For T1, L > 3.2; for P1, L < 2.2. For T2, L > 3.2, C > 3.2; for P2, L < 2.2, C < 2.2. The signal band (3.2 to 2.2) is 0.5 points above and below the trend rate in the indexes (2.7%, 1976-86).

n.s. = no signal

Tables 2-4 provide information on the usefulness of the growth cycle signals in tracking inflation cycle turning points for the United Kingdom, West Germany, and Japan. For the U.K., the average lead of the initial signal dates over the inflation cycle was 15 months at peaks and troughs, while the second signal led by four months. For West Germany the comparable leads were 7 and 3 months, and for Japan 3 months at each signal.

Chart 5 shows the growth rates in the U.S. and Japanese coincident indexes. It demonstrates one very serious limitation in using the fixed trend rate of growth from 1976 to 1986 in the growth cycle and inflation cycle signal system. The trend growth rate per year for the U.S. was 2.7 percent from 1976 to 1986 which was not much different from the 3 percent trend rate for 1966 to 1976. In contrast, the 4.2 percent trend rate of growth for Japan for 1976 to 1986 was significantly lower than the 8 percent trend rate for 1966 to 1976 and even lower than the skyrocketing trend of the previous decade. Thus, the 4.2 percent trend rate used to construct the signals has hardly any relevance to the slowdowns in economic growth rates in Japan for the 1950s and 1960s.

Table 5 records the rates of inflation at the signal dates for the U.S., and measures the change in inflation during the corresponding interval. During the intervals when the initial growth cycle signals indicated a downturn, the inflation rate declined on average by 1.8 percentage points. During the episodes when the initial signals suggested an upswing in inflation, the average advance was 2.4 percentage points.

During inflation cycle downswings, the average decline in the CPI growth rate was 5.1 percentage points; thus, slightly more than one-third of the reduction in the inflation rate occurred when signals were flashing a slower inflation message. During inflation cycle upswings, the average increase in the inflation rate was 5.3 points; on average, over 45 percent of this increase occurred when the inflation signals were flashing a message of quickening price increases. The performance of the second signals in the U.S. is only marginally better than those of the first signals.

TABLE 2

## INFLATION CYCLE TURNS AND GROWTH CYCLE SIGNALS, UNITED KINGDOM

INFLATION CYCLE CHRONOLOGY		INITIAL GROWTH CYCLE SIGNALS		LEAD(-) OR LAG(+), IN MONTHS		FINAL GROWTH CYCLE SIGNALS		LEAD(-) OR LAG(+), IN MONTHS	
TROUGH	PEAK	T1	P1	T1	P1	T2	P2	T2	P2
6/50		n.a.				n.a.			
	9/51		n.a.				n.a.		
2/54		n.a.				n.a.			
	11/55		n.a.				n.a.		
6/59		9/58		-9		2/59		-4	
	3/62		7/60		-20		12/61		-3
8/63		4/63		-4		4/63		-4	
	7/65		1/65		-6		9/66		10
7/67		7/67		0		12/67		5	
	7/71		2/69		-29		2/71		-5
5/72		10/70		-19		4/72		-1	
	6/75		11/73		-19		1/74		-17
5/78		11/75		-30		7/76		-22	
	4/80		12/79		-4		2/80		-2
5/83		5/81		-24		5/83		0	
	4/85		7/82		-33		n.s.		
8/86		9/86		+1		n.s.			
AVERAGE: P,T				-12	-18			-4	-3
P&T					-15				-4

Notes: Inflation cycle turns are based on the CPI inflation rate (SM6). Signals are based on the IEI leading (L) and coincident (C) growth rates. For T<sub>1</sub>, < > 2.0; for P<sub>1</sub>, L < 1.0. For T<sub>2</sub>, L > 2.0, C > 2.0. For P<sub>2</sub>, L < 1.0, C < 1.0. The Signal band (2.0 to 1.0) is 0.5 points above and below the trend rate in the indexes (1.5, 1976-1986). n.a. = not available. n.s. = no signal.

TABLE 3  
INFLATION CYCLE TURNS AND GROWTH CYCLE SIGNALS, WEST GERMANY

INFLATION CYCLE CHRONOLOGY		INITIAL GROWTH CYCLE SIGNALS		LEAD(-) OR LAG(+), IN MONTHS		FINAL GROWTH CYCLE SIGNALS		LEAD(-) OR LAG(+), IN MONTHS	
TROUGH	PEAK	T1	P1	T1	P1	T2	P2	T2	P2
	5/58		1/58		-4				
4/59	11/65	8/58	6/65	-8	-5		7/66		+8
12/67	12/73	8/67	4/73	-4	-8	12/67	10/73	0	-2
10/78	9/81	10/77	3/80	-12	-18	10/77	6/80	-12	-15
11/86		2/87		+3		2/87		+3	
AVERAGE: P,T				-5(-6)	-9(-10)			-5	-3
P&T					-7(-7)				-3

Note: Inflation cycle turns are based on the CPI inflation rate (SM6). Signals are based on the IEI leading (L) and coincident (C) growth rates (SM6). For T<sub>1</sub>, L > 2.5; for P<sub>1</sub>, L < 1.5; For T<sub>2</sub>, L > 2.5, C > 2.5; for P<sub>2</sub>, L < 1.5, C < 1.5. The Signal band (2.5 to 1.5) is 0.5 points above and below the trend rates in the indexes (2.0, 1976-86).

Figures in parentheses refer to leads of T<sub>1</sub> and P<sub>1</sub> signals which are comparable to T<sub>2</sub> and P<sub>2</sub> signals.

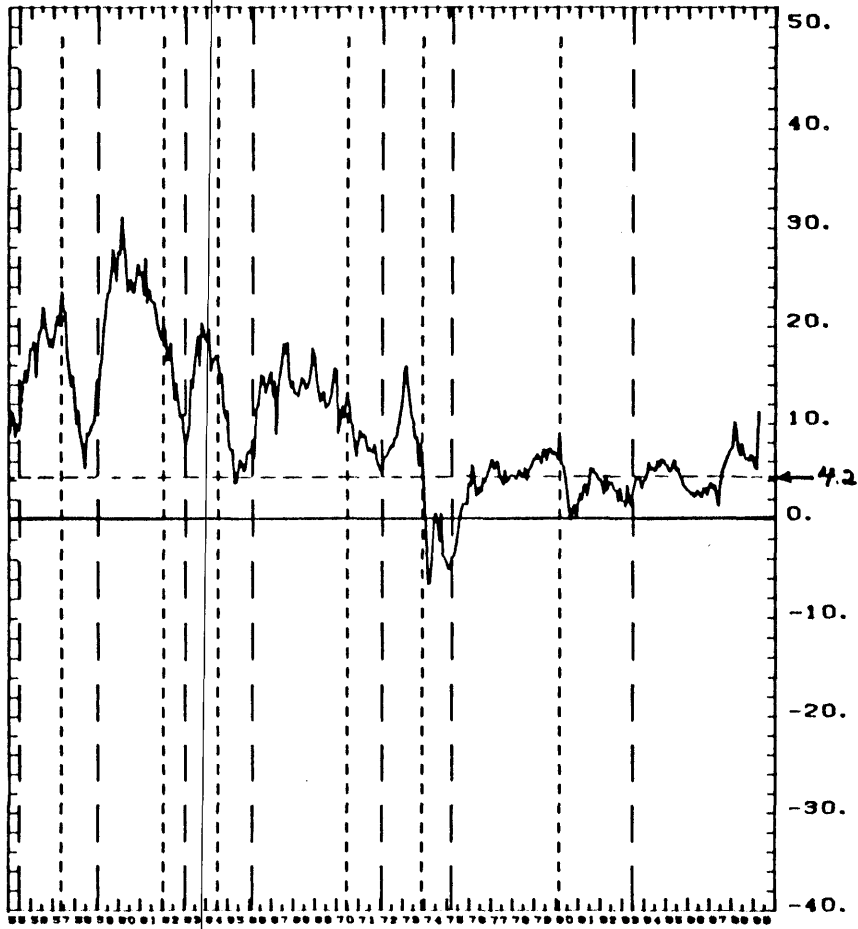
TABLE 4  
INFLATION CYCLE TURNS AND GROWTH CYCLE SIGNALS, JAPAN

INFLATION CYCLE CHRONOLOGY		INITIAL GROWTH CYCLE SIGNALS		LEAD(-) OR LAG(+), IN MONTHS		FINAL GROWTH CYCLE SIGNALS		LEAD(-) OR LAG(+), IN MONTHS	
TROUGH	PEAK	T1	P1	T1	P1	T2	P2	T2	P2
10/52		n.a.				n.a.			
	10/53		2/54		+4		n.a.		
12/54		2/55		+2		n.a.			
	7/57		6/57		-1		n.s.		
2/58		10/58		+8		n.s.			
	12/61		9/61		-3		n.s.		
2/64		3/63		-13		n.s.			
	4/65		3/64		-13		4/65		0
7/67		1/66		-18		1/66		-18	
	1/70		6/70		+5		n.s.		
4/72		3/72		-1		n.s.			
	2/74		3/74		+1		3/74		+1
2/79		3/78		-11		4/78		-10	
	4/80		6/80		+2		6/80		+2
1/87		9/86		-4		7/87		+6	
FALSE SIGNALS		9/60	7/60			2/76	7/77		
		10/75	2/77			3/84	10/85		
		9/81	2/82						
		5/83	7/85						
AVERAGE: P,T				-5(-11)				-7	
P&T				-3(-7)				-3	
								+1	

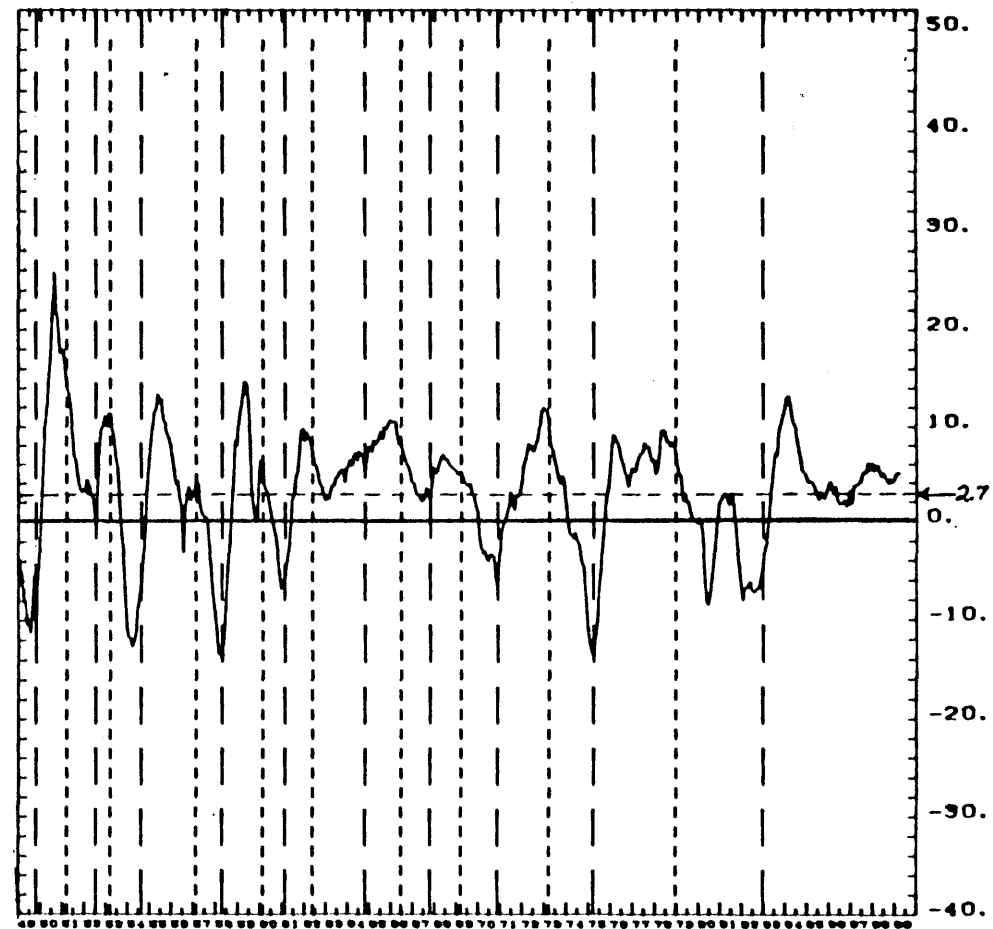
Note: Inflation cycle turns are based on the CPI inflation rate (SM6). Signals are based on the IEI leading (L) and coincident (C) growth rates. For T<sub>1</sub>, L > 4.7; for P<sub>1</sub>, L < 3.7. For T<sub>2</sub>, L > 4.7, C > 4.7 for P<sub>2</sub>, L < 3.7, C < 3.7. The signal band (4.7 to 3.7) is 0.5 points above and below the trend rate in the indexes (4.2, 1976-86). n.a. = not available. n.s. = no signal. Figures in parentheses refer to average leads of P<sub>1</sub> and T<sub>1</sub> which are comparable to P<sub>2</sub> and T<sub>2</sub> signals.

# CHART 5. GROWTH RATES IN COINCIDENT INDEXES: JAPAN, UNITED STATES

## JAPAN



## UNITED STATES



Note: Vertical lines are growth cycle peaks (-----) and troughs (——). Horizontal dash lines are average growth rates, 1976-86.

Center for International Business Cycle Research.

TABLE 5

## CHANGES IN INFLATION RATES BETWEEN GROWTH CYCLE SIGNAL DATES, UNITED STATES

INITIAL GROWTH CYCLE SIGNAL DATES		INFLATION RATES AT INITIAL SIGNALS		CHANGE IN INFLATION RATES BETWEEN INITIAL SIGNALS		FINAL SIGNAL DATES		INFLATION RATES AT FINAL SIGNAL DATES		CHANGE IN INFLATION RATES BETWEEN FINAL SIGNAL DATES	
T1	P1	T1	P1	P1 to T1	T1 to P1	T2	P2	T2	P2	P2 to T2	T2 to P2
11/49		-1.4				2/50		-1.3			
	4/51		10.1		+11.5		6/52		2.1		+3.4
8/52		2.3		-7.8		8/52		2.3		+0.2	
	5/53		0.8		-1.5		8/53		1.1		-1.2
6/54		0.4		-0.4		12/54		-1.0		-2.1	
	1/56		0.3		-0.1		6/56		2.0		+3.0
7/58		2.1		+1.8		10/58		1.1		-0.9	
	8/59		1.2		-0.9		9/59		1.5		+0.4
4/61		0.7		-0.5		8/61		0.9		-0.6	
	5/66		3.3		+2.6		5/67		2.1		+1.1
7/67		2.6		-0.7		8/67		2.9		+0.8	
	5/69		5.3		+2.7		11/69		5.9		+3.0
12/70		5.3		0.0		12/71		3.5		-2.4	
	8/73		8.8		+3.5		12/73		9.2		+5.7
7/75		8.1		-0.7		11/75		7.4		-1.8	
	1/79		9.3		+1.2		4/79		10.9		+3.5
12/82		3.0		-6.3		5/83		2.7		-8.2	
AVERAGE		2.6	4.9	-1.8	+2.4			2.1	4.4	-1.9	+2.4

Tables 6-8 show the comparable statistics for the U.K., West Germany, and Japan. For each country, the final growth signals picked up more than half of the quickening and the decelerating of the inflation rate. For example, for the U.K., the inflation rate rose on average by 5.3 percentage points from final signal troughs (T2) to final signal peaks. In contrast, it fell on average by 5.1 points from final peaks to troughs. These changes amount to roughly 50 percent of the changes which occurred from inflation cycle peaks and troughs. The changes in the CPI for West Germany as well as for Japan between final signal dates were roughly two-thirds of the changes between inflation cycle turning points.

#### 4. GROWTH CYCLE SIGNALS AND INTEREST RATES.

Since there is a connection between changes in interest rates and changes in inflation as well as in economic growth, the growth cycle signals may be of some value to those who are concerned with developments in credit markets. Table 9 explores this possibility. It shows that the initial growth cycle signal dates usually lead the peaks and troughs in T-Bill Rates in the U.S. The table discloses how the growth cycle signal system, if adopted as a tool for investing in T-Bills would have performed from 1949 to 1983. The results are stated in terms of the levels of rates two months after the signal dates; the two months are added to provide sufficient time to recognize the signal.

Table 9 shows the rises and falls in T-Bill Rates during the T1+2 to P1+2 intervals. It discloses, for instance, that cumulatively purchasers of the 90-day T-Bills at T1+2 dates would have saved over 1500 basis points relative to what those financial instruments would have cost if they had been purchased at P1+2 dates. On the other hand, T-Bills fell on a cumulative basis over 800 basis points between P1+2 and T1+2 dates. When the signals indicated fast growth ahead T-Bill rose every time. When they warned of slower growth, the rates fell 75% of the time.



TABLE 6  
CHANGES IN INFLATION RATES BETWEEN GROWTH CYCLE SIGNAL DATES, UNITED KINGDOM

INITIAL GROWTH CYCLE SIGNAL DATES		INFLATION RATES AT INITIAL SIGNALS		CHANGE IN INFLATION RATES BETWEEN INITIAL SIGNALS		FINAL SIGNAL DATES		INFLATION RATES AT FINAL SIGNAL DATES		CHANGE IN INFLATION RATES BETWEEN FINAL SIGNAL DATES	
T1	P1	T1	P1	P1 to T1	T1 to P1	T2	P2	T2	P2	P2 to T2	T2 to P2
9/58		1.0				2/59		2.5			
	7/60		2.2		+1.2		12/61		4.7		+2.2
4/63		2.3		+0.1		4/63		2.3		-2.4	
	1/65		4.9		+2.6		9/66		4.4		+2.1
7/67		1.7		-3.2		12/67		3.4		-1.0	
	2/69		6.3		+4.6		2/71		8.5		+5.1
10/70		8.2		+1.9		4/72		5.2		-3.3	
	11/73		11.5		+4.3		1/74		13.6		+8.4
11/75		22.1		+10.6		7/76		11.1		-2.5	
	12/79		17.6		-4.5		2/80		19.8		+8.7
5/81		12.2		-5.4		5/83		3.5		-16.3	
	7/82		7.4		-4.8		n.s.				
9/86		3.3		-4.1		n.s.					
AVERAGE		7.3	8.3	0.0	+0.6			4.7	10.2	-5.1	+5.3

TABLE 7

## CHANGES IN INFLATION RATES BETWEEN GROWTH CYCLE SIGNAL DATES, WEST GERMANY

INITIAL GROWTH CYCLE SIGNAL DATES		INFLATION RATES AT INITIAL SIGNALS		CHANGE IN INFLATION RATES BETWEEN INITIAL SIGNALS		FINAL SIGNAL DATES		INFLATION RATES AT FINAL SIGNAL DATES		CHANGE IN INFLATION RATES BETWEEN FINAL SIGNAL DATES	
T1	P1	T1	P1	P1 to T1	T1 to P1	T2	P2	T2	P2	P2 to T2	T2 to P2
	1/58		2.8				n.s.				
8/58		0.0		-2.8		n.s.					
	6/65		3.9		+3.9		7/66		3.1		
8/67		1.4		-2.5		12/67		0.3		-2.8	
	4/73		7.0		+5.6		10/73		6.4		+6.1
10/77		2.1		-4.9		10/77		3.5		-2.9	
	3/80		6.3		+4.2		6/80		5.7		+2.2
2/87		-1.4		-4.9		2/87		-0.1		-5.8	
AVERAGE		0.5	5.0	-3.8	+4.6			1.2	6.1	-3.8	+4.2

TABLE 8

## CHANGES IN INFLATION RATES BETWEEN GROWTH CYCLE SIGNAL DATES, JAPAN

INITIAL GROWTH CYCLE SIGNAL DATES		INFLATION RATES AT INITIAL SIGNALS		CHANGE IN INFLATION RATES BETWEEN INITIAL SIGNALS		FINAL SIGNAL DATES		INFLATION RATES AT FINAL SIGNAL DATES		CHANGE IN INFLATION RATES BETWEEN FINAL SIGNAL DATES	
T1	P1	T1	P1	P1 to T1	T1 to P1	T2	P2	T2	P2	P2 to T2	T2 to P2
	2/54		9.7	-12.4							
2/55	6/57	-2.7	5.3		+8.0						
10/58	9/61	3.6	6.4	-1.7	+2.8	n.s.	n.s.				
3/63	3/64	9.6	1.8	+3.2	-7.8	n.s.	4/65	4.6	8.6		
1/66	6/70	4.6	5.7	+2.8	+1.1	1/66	n.s.			-4.0	
3/72	3/74	3.8	27.1	-1.9	+23.3	n.s.	3/74		27.1		+22.5
3/78	6/80	4.8	8.6	-22.3	+3.8	4/78	6/80	4.1	8.6	-23.0	+4.5
9/86		-0.6		-9.2		7/87		0.5		-8.1	
AVERAGE		3.7	9.2	-5.9	+5.2			4.6	14.8	-11.7	+13.5

n.s.= no signal

TABLE 9

## GROWTH CYCLE SIGNAL SYSTEM: TREASURY BILL RATES, UNITED STATES

TREASURY BILL RATE Chronology		Initial Growth Cycle Signals		TREASURY BILL RATE (%) at		Basis Point Change in Rate	
Trough	Peak	T1	P1	T1+2	P1+2	P1+2 to T1+2	T1+2 to P1+2
7/49		11/49		1.09			
	2/51		4/51		1.50		+41
4/52		8/52		1.78		+28	
	6/53		5/53		2.10		+32
6/54		6/54		.89		-121	
	10/57		1/56		2.31		+142
6/58		7/58		2.48		+17	
	12/59		8/59		4.12		+164
12/60		4/61		2.36		-176	
	10/66		5/66		4.86		+250
6/67		7/67		3.77		-41	
	1/70		5/69		7.00		+255
1/72		12/70		6.38		-323	
	8/74		8/73		7.16		+339
12/76		7/75			9.46		+308
	3/80		1/79				
6/80		-					
	5/81		-				
1/83		12/82		8.13		-133	
	8/84						
3/87							
Total Basis Point Change, 1949-1983						-827	+1531

## 5. SUMMARY OF FINDINGS.

This paper builds on earlier research for the industrialized nations which showed that slowdowns in economic growth generally brought about reductions in inflation rates. This well-known proposition was used to construct a signal system which appears to be of use in identifying when peaks and troughs in inflation cycles will occur. The signals are based on rates of growth in the CIBCR leading and coincident indexes. When smoothed growth rates in these indexes move through a one percentage point band centered on the trend rate of growth from 1976 to 1986, signals of inflation peaks and troughs are triggered. More specifically, when the smoothed growth rates in these indexes go more than 0.5 percentage points below the trend rate of growth this is a signal of an inflation peak. When they go 0.5 points above the trend rate, this signals an inflation trough. The initial and final signals of inflation peaks and troughs usually led the inflation cycle in the four countries examined, namely, the U.S., the U.K., West Germany, and Japan. The movements of the inflation rates between final signal dates captured a substantial proportion of the movements in the inflation rate over the inflation cycle. Finally, a preliminary study of the relationship between the signal dates and short-term interest rates in the U.S. shows that these interest rates usually rise from signal trough to signal peak dates and fall from peak to trough dates. We intend to investigate the relationship between interest rates and the signal dates in the other countries examined as well, and to extend the study to cover long-term rates.