Part III
Broad Topics on Business Cycle Analysis and Measurement

15

Business Cycles in Asian Countries

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Introduction

The SEPIA project covers seven Asian countries. On the basis of research results into the business cycles of each country, this paper[1] attempts a comprehensive study of the business cycles in the region through a presentation of regional business cycle indicators and also through cross-country comparisons.

The first section is devoted to identifying and analyzing the regional reference cycles. The relation between these reference cycles and each country's business cycles as well as the correlation of the cycles in all seven countries are studied in the second section. The third section measures the amplitude of business cycles in each country in order to overcome the shortcomings of measurement by DIs, which are only able to indicate the expansion or contraction of business conditions. The fourth section compares the duration of cyclical phases.

Reference Cycles in the Asian NIEs and ASEAN Countries

These is a clear difference in economic performance and economic structure between the Asian NIEs and ASEAN countries. Such differences are reflected in the pattern of business cycles. Therefore two regional reference cycles will be constructed in this section in order to look at the features of regional business cycles. One is the cycle of the Asian NIEs (Korea, Taiwan, Hong Kong, and Singapore) and the other is that of the ASEAN countries (Indonesia, Malaysia, the Philippines, and Thailand).

The reference cycles are constructed first by summing up the national annual growth rates[2] of the monthly industrial production index or of substitute variables (such as electric power consumption for industrial produc-
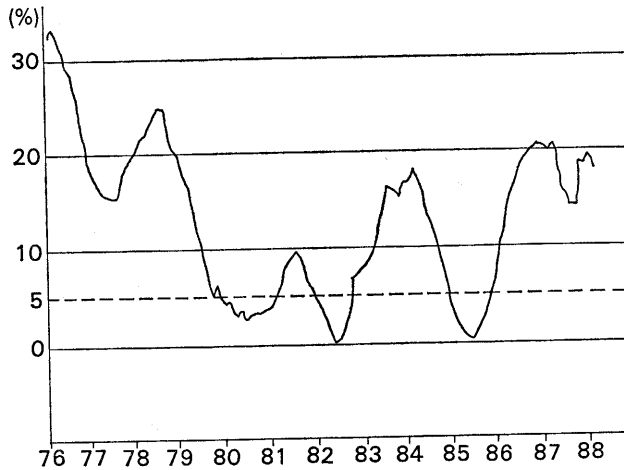
Fig. 15–1
Reference Cycles of Asian NIEs as a Whole

Table 15–1
The Three Recessions for the Asian NIEs Economy as a Whole

	Period	Duration
First recession	Dec. 1979 to Mar. 1981	16 months
Second recession	Dec. 1981 to Oct. 1982	11 months
Third recession	Jan. 1985 to Nov. 1985	11 months

tion) after weighting these by the U.S.-dollar-denominated GDP of each country. Then the five-month moving average values of the reference cycle are taken to smooth cyclical movement.

The reference cycles for the Asian NIEs as a whole are given in Figure 15–1. In the figure, the 5 per cent line is provisionally drawn to identify the period of recession. According to this criterion, three recessions are identified (Table 15–1).

The first dip in 1977 is not identified as a trough, but as a dip reflecting the recession in Hong Kong and Singapore. There was a minor nine-month expansion in the midst of 1981, between the first and the second recessions.

The Korean and Singapore economies in December 1980 entered an expansionary phase which lasted through 1981. In contrast, the Taiwanese economy experienced a recession from January 1980 to February 1983, and the Hong Kong economy also went into recession from February 1980 to January 1983.

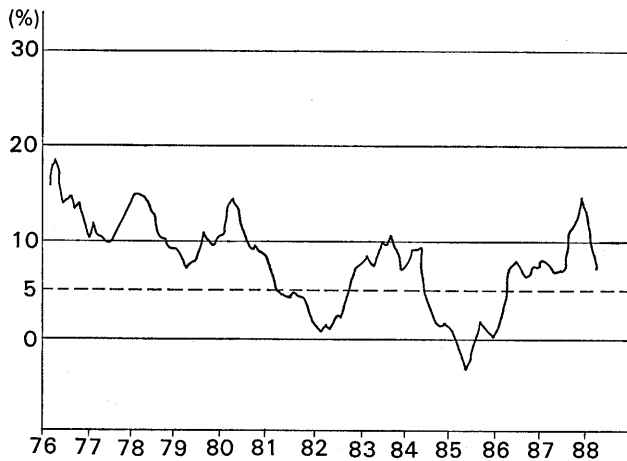The reference cycles for the ASEAN countries as a whole (Figure 15–2)

Fig. 15–2
Reference Cycles of ASEAN Countries as a Whole

Table 15–2
The Two Recessions for the ASEAN Economy as a Whole

	Period	Duration
First recession	Mar. 1981 to Oct. 1982	20 months
Second recession	Jul. 1984 to Apr. 1985	22 months

exhibit four troughs. The first trough was in 1977. During this period, the Malaysian and Philippine economies experienced slight recessions. The second trough lay between the latter half of 1978 and the beginning of 1979, when only the Indonesian economy experienced a recession. Thus there was no general ASEAN recession during the period from 1977 to 1979. According to the 5 per cent criterion, two recession periods can be identified (Table 15–2).

The above data indicate two recession periods common to the Asian NIEs and ASEAN countries, the period in 1982 and the period from 1984 to 1985. However, before 1980 we can not find similarities in the business cycle pattern between the Asian NIEs as a whole and the ASEAN region.

Comparison of Business Cycle Patterns in Six Asian Countries

Reference Dates

To begin with, the business cycle patterns of Indonesia, Korea, Malaysia, the Philippines, Singapore, and Thailand will be examined focusing on the

Table 15–3
The Reference Dates of Business Cycles

	Trough	Peak	Trough	Expansion (Months)	Contraction (Months)	Cycle (Months)
Korea						
1	1973/5	74/3	75/5	10	14	24
2	75/5	76/8	77/6	15	10	25
3	77/6	79/3	80/10	21	19	40
4	80/10	81/9	82/9	11	12	23
5	82/9	84/7	85/11	22	16	38
		Average 1–5		15.8	14.2	30.0
		(Average 3–5		18.0	15.6	33.6)
Singapore						
1	1975/4	79/12	80/10	56	10	66
2	80/10	81/5	83/4	7	11	18
3	83/4	84/2	86/3	10	25	35
		Average		24.3	15.3	39.6
Indonesia						
1		77/12	79/2		(14)	
2	1979/2	81/11	82/10	33	11	44
3	82/10	84/7	86/3	21	20	41
		Average		27	15.5	42.5
Malaysia						
1		74/2	75/6		(16)	
2	1975/6	77/3	77/9	21	6	27
3	77/9	80/3	82/1	30	22	52
4	82/1	84/11	86/5	34	18	52
		Average		28.3	15.3	43.6
Philippines						
1	1976/3	77/1	77/7	10	6	16
2	77/7	80/1	82/11	30	34	64
3	82/11	83/8	86/5	9	33	42
		Average		16.3	24.3	40.6
Thailand						
1	1972/7	74/6	75/11	23	17	40
2	75/11	79/12	80/9	49	9	58
3	80/9	81/8	82/8	11	12	23
4	82/8	83/12	85/12	16	24	40
		Average		24.75	15.5	40.25

reference dates identified by the HDIs compiled by the Institute of Developing Economies.[3] Table 15–3 gives the reference dates for peaks and troughs, the lengths of expansion and contraction, and the duration of each cycle.

If we focus only on the similarity of the turning points in the business cycles, we see that it is fairly strong between Singapore and Thailand; if we allow a slight deviation, a similarity of turning points can be observed between Malaysia and Indonesia. However, the reference dates for Korea and the Philippines are different from those of the other countries. During the 1980s the cycle pattern for Korea closely resembles that of Singapore, while the pattern for the Philippines bears a remote resemblance to that for Malaysia.

Comparison of the Reference Cycles and Reference Dates

We will examine next the relationship of the leads and lags in the reference cycles given in the first section with those of the reference dates identified by IDE. It is clear from Table 15–4 that the reference dates for Korea have always led those for the reference cycles of the Asian NIEs as a whole at every peak and trough. The reference dates for Singapore have led only at the peaks and have lagged at the last two troughs. Table 15–5 shows the same analysis for the ASEAN countries. It is very clear that in the past two recessions the Philippine economy in comparison with the other countries has experienced recession about one year earlier and ended one month later. Therefore, the duration of recession in the Philippines is about one

Table 15–4
Lead-lag Relationship of Asian NIEs

	Peak Dec. 79	Trough Mar. 81	Peak Dec. 81	Trough Oct. 82	Peak Jan. 85	Trough Nov. 85
Korea	−9	−5	−3	−2	−6	0
Singapore	0	−5	−7	+6	−11	+4

Table 15–5
Lead-lag Relationship of ASEAN Countries

	Peak Mar. 81	Trough Oct. 82	Peak Jul. 84	Trough Apr. 86
Indonesia	+8	0	0	−1
Malaysia	−12	−9	+4	+1
Philippines	−14	+1	−11	+1
Thailand	+5	−2	−7	−4

Table 15–6
Matrix of Cross-correlations between CIs

	Indonesia	Malaysia	Philippines	Thailand	Korea	Singapore
Indonesia	—	0.802	0.452	0.949	0.873	0.960
Malaysia	0.802	—	0.707	0.893	0.593	0.827
Philippines	0.452	0.707	—	0.610	0.172	0.462
Thailand	0.949	0.893	0.610	—	0.839	0.971
Korea	0.873	0.593	0.172	0.839	—	0.901
Singapore	0.960	0.827	0.462	0.971	0.901	—

year longer than that of the other ASEAN countries. The dates for troughs in Thailand's cycles have always led compared with the other ASEAN countries. The lead and lag relationships of the business cycles in Indonesia and Malaysia have no special features to point out in this analysis.

Correlation Analysis of the Six Countries

We will now make a cross-country comparison of the business cycle patterns. To do this we compute the correlation coefficients of the roughly coincident indicators of the CIs for the six countries.[4] Using correlation analysis we can make the quantitative comparison of the total aspect of business cycles, meaning not only the duration of business cycles but also their amplitude. Table 15–6 gives a matrix of cross-correlation coefficients.

In general, the values of the correlation coefficients, except for the Philippines, are much higher than those I initially expected. It is necessary to note that only the correlation coefficient between Korea and Malaysia is considerably low in value ($r=0.593$). The values measured between the Philippines and the other five countries are fairly small, and of these values the one for Malaysia is the highest at 0.707.

The Strength of Cyclical Movements

There is no absolute way to measure the strength of cyclical movements. Here I apply a very simple method of measurement as a rough guide. The estimated results are the approximate values of the amplitude of business cycles. The amplitude of a cycle at a peak or a trough is measured by the ratio of the production index to that of the corresponding month of the previous year. If, for example, this ratio at peak is 21.2 per cent and the following trough is −0.8 per cent, then the amplitude of a cycle is 21.2+ 0.8=22 per cent. However, these ratios are very unstable in some countries, so suitable allowance is made for smoothing out extreme values. We compute the three-months moving average values of the ratios.

Table 15-7
Growth Rates of Production Indices at Peak and Trough (%)

	Peak	Trough	Peak	Trough	Peak	Trough	(1) Average at Peak	(2) Average at Trough	(1)−(2) Amplitude
Korea	79/3	80/10	81/9	82/9	84/7	85/11			
	21.2	−0.8	15.5	0.4	16.6	6.3	17.8	2.0	15.8
Singapore	79/12	80/10	81/5	83/4	84/2	86/3			
	15.9	10.7	12.2	−3.5	11.6	−2.5	13.2	1.6	11.6
Indonesia	77/12	79/2	81/11	82/10	84/7	86/3			
	22.8	0.7	8.3	0.2	7.4	4.1	12.8	1.7	11.1
Malaysia	77/3	77/9	80/3	82/1	84/1	86/5			
	17.5	6.8	12.3	−4.3	12.8	2.3	14.2	1.6	12.6
Philippines	77/1	77/7	80/1	82/11	83/8	86/5			
	15.6	−10.8	7.0	0.2	26.6	1.8	16.4	−2.9	19.3
Thailand	79/12	80/9	81/8	82/8	83/12	85/12			
	14.9	1.6	6.0	4.9	11.1	−4.7	10.7	0.6	10.1

The computed results, showing the average strength at peak, the average strength at trough, and the average amplitude of cycles, are given in Table 15-7.

The order of the large value of the average amplitude is: the Philippines, Korea, Malaysia, Singapore, Indonesia, and Thailand. The values of the average amplitude for Thailand, Indonesia, and Singapore are very small. In other words, the economic fluctuations in those three countries are comparably moderate. In contrast, the average amplitude of a cycle in the Philippines is the largest, the average value at the peak being 16.4 per cent and at the trough −2.9 per cent. The value of the amplitude for the Philippines is therefore about twice as large as that for Thailand.

Duration of Cycles

The average duration of cycles is also different from country to country. According to Table 15-3, the average expansion period of a cycle for all the countries except the Philippines is 24.5 months, and the average contraction period is 15.4 months. Therefore the average duration of a cycle is about 40 months. The average expansion period in the Philippines is 16.3 months, and the average contraction period is 24.3 months. These are entirely different from the other five countries. The average duration of a cycle in Korea is also slightly different from those of the other countries. The distinctive features of the Korean business cycle are that the average duration of a cycle is shorter than those of the other countries, and the cycles are

more symmetrical. There is almost no difference between the average expansion period and the average contraction period.

Notes

1   In Mori (1988), I compiled regional DIs and also analyzed the turning points and durations of business cycles in Asian countries.
2   The ratio to the corresponding month of the previous year.
3   The present reference dates for Singapore are slightly different from the ones depicted in Table 15–3, as they were revised in March 1990.
4   The CIs are compiled from the same components as the roughly coincident indicators of the DIs compiled by IDE.

Bibliography

Mori, Kazuo. 1988. "Business Cycles in Asia." In Chapter 16 of *Business Cycles in Five ASEAN Countries, India, and Korea*. Tokyo: Institute of Developing Economies.