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# 7 The Yen and Its East Asian Neighbors, 1980–1995: Cooperation or Competition?

Shinji Takagi

## 7.1 Introduction

There has recently been a marked increase in real economic integration among the Asian countries. For example, the share of intraregional trade in the total exports of Asia (which excludes Japan) rose from 30.9 percent in 1986 to 45.7 percent in 1994, while the share of exports to the United States declined from 34.0 to 24.5 percent during the same period (Kwan 1995). In the rapidly industrializing economies of Asia, the share of Japan is now considerably larger than that of the United States in imports, although not in exports (table 7.1). Japan is at least equal in importance to the United States as a trading partner of most Asian countries.

Despite the increasing pace of intraregional integration, the declining share of the United States in international trade, and the significant status of Japan as a trading partner, the exchange rate policies of most East Asian countries remain that of limiting fluctuations in the nominal values of their currencies relative to the U.S. dollar in one form or another. Most empirical studies as well as casual observation seem to suggest that the U.S. dollar remains strong, and the Japanese yen remains marginal, as the anchor of exchange rate policies in the region.

Against this background, the paper will examine the role of the Japanese yen in the exchange rate policies of selected Asian countries,<sup>1</sup> namely, Korea, Singapore, Malaysia, Indonesia, the Philippines, and Thailand. This is not a

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1. In discussing the role of the yen in Asia, there is also the separate question of how widely the yen is used in intraregional transactions. The emphasis of the paper, however, is strictly on the importance of the yen in the determination of the nominal values of East Asian currencies.

**Table 7.1** Import and Export Shares of the United States, Japan, and European Union in Selected Asian Countries, 1994 (percent of total)

Country	Imports			Exports			Total Trade		
	U.S.	Japan	EU	U.S.	Japan	EU	U.S.	Japan	EU
Korea	21.6	25.4	13.0	21.4	14.1	10.6	21.2	19.6	11.7
Singapore	15.3	22.0	12.1	18.8	7.0	13.0	17.0	14.7	12.5
Malaysia	16.6	26.7	13.5	21.2	11.9	13.9	18.9	19.4	13.7
Indonesia	10.1	27.6	18.5	16.8	30.9	16.7	13.8	29.4	17.5
Philippines	18.5	24.2	10.3	38.5	15.0	17.1	26.0	20.8	12.8
Thailand	11.3	30.4	14.4	23.2	18.0	15.7	16.5	25.0	15.0

Source: IMF, *Direction of Trade Statistics Yearbook* (Washington, D.C., 1995).

new topic. The widely cited study by Frankel and Wei (1994), for example, has examined this very issue by econometrically estimating the implicit weights of the U.S. dollar and the Japanese yen in the determination of the nominal values of major Asian currencies. The present study is meant to complement the empirical findings obtained from the econometric approach by taking the alternative approach of observing currency movements when the Japanese yen fluctuates sharply in one direction against the U.S. dollar.

To be sure, the monetary authorities of Asian countries must assign different weights to variables that may enter the objective functions of their exchange rate policies, such as price stability, stability of nominal effective exchange rate indexes, stability of real effective exchange rate indexes, encouragement or discouragement of capital flows, accumulation of foreign exchange reserves, and export promotion. Thus the role of the yen in the exchange rate policy of a given country cannot be independent of the domestic and international environments within which the authorities are forced to operate. In this context, it is important to bear in mind that during the past 15 years or so, the yen significantly appreciated against the U.S. dollar in both nominal and real terms (table 7.2). In this environment, the decision to minimize fluctuations against the yen would have meant that the authorities must accept some appreciation of their currency against the U.S. dollar and other Asian currencies.

If a large weight is given to export promotion in the objective function of the authorities, they may have been reluctant to tie their currency too closely to the appreciating yen, to the extent that nominal currency appreciation may work to reduce the growth of exports in the short run. Thus, ex post, the currency in question must have moved closely with the U.S. dollar and depreciated against the yen, such that its relationship with the yen may be characterized as "competitive" in that, relative to the yen, exchange rate stability was willingly sacrificed in favor of depreciation to preserve competitiveness.

On the other hand, if a large weight is given to price stability, the authorities may have been less willing to tolerate nominal depreciation and hence higher domestic inflation, by tying the currency too closely to the U.S. dollar. This

**Table 7.2** Nominal and Real Exchange Rates of the Japanese Yen against the U.S. Dollar and Selected Asian Currencies, 1980–95  
(annual averages, 1990 = 100)

Year	United States		Korea		Singapore		Malaysia		Indonesia		Philippines		Thailand	
	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real
1980	63.9	91.5	54.8	83.8	75.4	72.8	51.4	n.a.	21.7	63.0	19.7	94.2	73.3	109.6
1981	65.7	87.5	63.2	81.3	76.5	72.1	55.9	n.a.	22.5	60.2	21.3	90.1	78.3	108.4
1982	58.1	77.3	60.0	75.2	68.6	68.7	50.2	n.a.	20.9	52.5	20.4	79.5	66.4	92.8
1983	61.0	78.3	66.8	81.6	71.1	72.2	52.3	n.a.	30.1	61.8	27.9	91.4	67.1	89.8
1984	61.0	76.3	69.4	84.0	71.7	73.2	52.8	63.1	33.9	61.5	41.9	82.0	66.7	91.9
1985	60.7	75.5	74.6	88.5	73.7	76.0	55.7	67.2	36.6	62.8	46.5	76.0	64.9	88.4
1986	85.9	99.9	107.0	116.9	103.2	113.9	82.0	95.8	59.8	86.0	72.0	108.9	78.0	97.0
1987	101.1	109.3	116.3	121.9	116.3	115.0	93.2	101.1	89.3	107.4	84.7	113.0	97.7	110.4
1988	113.0	117.3	116.8	117.9	125.4	125.1	109.4	109.4	103.4	111.5	98.0	114.2	108.2	111.9
1989	105.0	106.5	99.6	101.6	112.9	112.6	105.1	103.9	100.8	104.5	93.8	101.3	103.2	104.6
1990	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1991	107.5	107.5	111.4	106.6	102.4	107.0	109.3	105.3	113.8	106.1	121.5	107.3	103.1	96.7
1992	114.3	112.0	126.1	116.3	102.7	110.6	107.7	101.0	125.9	109.1	120.0	99.8	104.8	96.7
1993	130.2	120.9	147.7	129.2	116.1	125.7	123.9	110.3	147.5	114.9	145.3	117.6	114.2	101.8
1994	141.7	127.2	160.8	134.0	119.4	127.2	137.4	114.2	166.1	114.8	153.9	112.8	123.7	103.8
1995	153.9	132.3	167.7	132.4	120.4	127.0	142.5	111.3	187.8	112.7	162.8	114.6	134.5	103.5

Source: IMF, *International Financial Statistics* (Washington, D.C., various issues); author's estimates.

Note: Bilateral real exchange rate indexes are based on wholesale prices; an increase in the index means an appreciation of the yen against the currency of the country concerned.

may be a particularly pertinent consideration, given the significant share of Japanese goods in total imports. In this case, *ex post*, the currency in question must have moved with the yen and appreciated against the U.S. dollar to a greater extent, and its relationship with the yen may be regarded as “cooperative,” in that such behavior has tended to contribute to monetary cooperation in Asia by promoting greater exchange rate stability in the environment of secular yen appreciation.

Occasionally, however, the yen did depreciate against the U.S. dollar on a sustained basis. On such occasions, the considerations of export promotion and price stability would have created exactly the opposite kind of reaction to the yen’s fluctuation on the part of the monetary authorities. With greater emphasis on export promotion, the authorities would have been more willing to allow the currency concerned to depreciate along with the yen against the U.S. dollar. With more emphasis on price stability, they would have been more unwilling to allow the currency to depreciate along with the yen. Thus, in the case of yen depreciation, export promotion would have encouraged greater exchange rate stability within Asia. However, throughout this paper, emphasis on price stability is regarded as “cooperative” behavior because, for the period taken as a whole, it has contributed more to promoting exchange rate stability within Asia.

The rest of the paper is organized as follows. Section 7.2 reviews the exchange rate arrangements of the six Asian countries, with some comments on the nominal and real exchange rate movements. Section 7.3 summarizes the econometric estimates of the implicit weights of the U.S. dollar and the Japanese yen in the determination of the nominal values of the currencies of the six Asian countries, as reported by Frankel and Wei (1994) and the more recent study of Kwan (1995). Section 7.4 provides additional insight into the relative weights of the U.S. dollar and the Japanese yen in the determination of the values of the six Asian currencies by looking at how they move when the yen fluctuates sharply against the dollar. Sections 7.5 and 7.6 take a look at the daily movements of the six Asian currencies during the periods of sharp yen appreciation and depreciation in the late 1980s and in 1995, respectively, in order to assess the response of the monetary authorities when the yen fluctuates sharply against the U.S. dollar. Section 7.7 presents concluding remarks.

## **7.2 An Overview of Exchange Rate Arrangements and Movements of Selected Asian Countries**

At the outset, it may be useful to review briefly the exchange rate arrangements of the six individual countries. According to official statements, Korea, Singapore, Malaysia, and Indonesia are classified as maintaining “other managed floating” rates, while Thailand maintains a peg to a currency composite, or a currency basket (International Monetary Fund [IMF] 1994). Of the six countries, only the Philippines is classified as maintaining a floating exchange

rate system. In practice, however, Indonesia and the Philippines are similar in that the rupiah and the peso are both managed tightly in terms of their U.S. dollar exchange rates over a short time horizon, while they have shown significant trend depreciation over a longer horizon (table 7.2); their exchange rate systems may more appropriately be classified as crawling pegs to the dollar.

Consistent with the crawling peg arrangement, both the Indonesian rupiah and the Philippine peso depreciated significantly against the U.S. dollar in nominal terms over the period 1980–95: the rupiah depreciated from 627 to 2,249 units per U.S. dollar, and the peso moved from 7.51 to 25.71 units per U.S. dollar, both on an annual average basis. In contrast, the other currencies showed relative stability against the U.S. dollar over this period. The Korean won first depreciated from 607.43 to 881.45 units per U.S. dollar between 1980 and 1986 but then appreciated to 671.46 units per U.S. dollar in 1989. The Singapore dollar showed a fairly steady appreciation against the U.S. dollar, rising from 2.14 to 1.42 units per U.S. dollar between 1980 and 1995. The Malaysian ringgit and the Thai baht depreciated at a modest pace against the U.S. dollar, with the ringgit falling from 2.18 to 2.50 units per U.S. dollar and the baht from 20.48 to 24.80 units per U.S. dollar over the period.

In real bilateral terms (on a wholesale price basis), the Korean won, the Singapore dollar, the Malaysian ringgit, and the Indonesian rupiah generally depreciated against both the U.S. dollar and the Japanese yen over the period, although they became much more stable during the latter part of the period (table 7.2). The Philippine peso, in contrast, appreciated in real terms against the U.S. dollar, although it depreciated against the Japanese yen over the period. Reflecting the higher rate of inflation, it even appreciated against the Japanese yen from 1988 to 1990 despite the significant nominal depreciation. Finally, the Thai baht appreciated against both the U.S. dollar and the Japanese yen over the period.

### 7.2.1 Korea

From February 1980 to March 1990, the won was officially linked to a basket of currencies, although it was effectively pegged to the U.S. dollar. On 2 March 1990, however, the Korean authorities adopted the “market average rate” (MAR) system, by which the dollar exchange rate is in principle determined by supply and demand conditions in the market, subject to a type of daily price limit. The Bank of Korea sets the won-dollar rate on the basis of a weighted average of interbank rates for spot transactions of the previous day. On each business day, the won-dollar exchange rate in the interbank market is allowed to fluctuate within fixed margins (currently, 1 percent on either side) against the MAR of the previous day.

The real exchange rates of the Korean won against the U.S. dollar and the Japanese yen closely followed the nominal exchange rates because the rate of inflation only slightly exceeded those in the United States and Japan. Over the period 1980–95, the Korean won depreciated against both the U.S. dollar and

the Japanese yen, naturally with the extent of depreciation against the yen being much more significant. From 1990 to 1994, although the won remained relatively stable against the dollar, it depreciated by as much as 34 percent against the yen. From 1994 to 1995, however, it marginally appreciated against the yen.

### 7.2.2 Singapore

The Monetary Authority of Singapore (MAS) “monitors the external value of the Singapore dollar against a trade-weighted basket of currencies, with the objective of promoting noninflationary sustainable economic growth” (IMF 1994). In Singapore, the central bank functions are performed by the Board of Commissioners of Currency (currency board) and the MAS. The currency board issues and redeems currency notes and coins, as demanded and backed by foreign assets. The MAS intervenes in the foreign exchange market whenever the exchange rate is out of line with the undisclosed target, which may well be changed from time to time. Given the openness and the small size of the economy, price stability is paramount as an objective of exchange rate policy (Toh 1996).<sup>2</sup>

In real terms, the Singapore dollar depreciated against both the U.S. dollar and the Japanese yen over the entire period 1980–95. From 1986 to 1990, however, the Singapore dollar appreciated against both currencies. From 1990 to 1994, it depreciated against the yen by almost 30 percent, while it remained stable against the U.S. dollar; from 1994 to 1995, it marginally appreciated against the yen. Judging from the behavior of the real exchange rate, it appears that, from about 1986, price stability became a particularly important objective of Singapore’s exchange rate policy.

### 7.2.3 Malaysia

From September 1975, the value of the ringgit has been determined by supply and demand conditions in the foreign exchange market by Bank Negara Malaysia with reference to the value determined by a basket of currencies of the country’s major trading partners (Ong 1996). According to the IMF (1994), the central bank is said to intervene “only to maintain orderly market conditions and to avoid excessive fluctuations in the value of the ringgit.”

In real terms, the ringgit depreciated against both the U.S. dollar and the Japanese yen over the entire sample period. The depreciation was particularly substantial against the yen. From 1990, however, the ringgit began to appreciate moderately against the U.S. dollar, in line with its nominal appreciation. However, it continued to depreciate against the yen until 1994, at which time it began to appreciate somewhat.

2. The term “low and stable domestic inflation” appeared as the official objective of Singapore’s exchange rate policy for the first time in the 1989 issue of the IMF’s annual report *Exchange Arrangements and Exchange Restrictions*.

#### 7.2.4 Indonesia

With the devaluation of the rupiah in November 1978, the link with the U.S. dollar was discontinued, and the middle rate of the rupiah began to be determined by the value of a basket of currencies and other considerations, subject to periodic devaluations. Following the 45 percent devaluation of September 1986, however, Bank Indonesia launched the exchange rate policy of maintaining the real effective exchange rate at a stable level in order to maintain Indonesia's competitiveness in the light of higher domestic inflation relative to its major trading partners (Goelton 1996). From 1986 to 1994, the rupiah thus depreciated at a rate of roughly 5 percent against the U.S. dollar per year in nominal terms.

Bank Indonesia continues to set the middle or reference rate of the rupiah in terms of the U.S. dollar by taking into account the behavior of a basket of currencies of Indonesia's major trading partners. In September 1994, however, Bank Indonesia ceased to announce the middle rate and at the same time began to widen the intervention band around the middle rate in order to increase the risk of speculation in the rupiah. Currently, the intervention band is approximately 3 percent on either side of the now undisclosed reference rate against the U.S. dollar.

Although the Indonesian rupiah depreciated against both the U.S. dollar and the Japanese yen over the entire period in real terms, it remained much more stable after 1986, in line with the stated objective of the exchange rate policy. In fact, it appreciated in real terms against the U.S. dollar by about 20 percent from 1990 to 1995, while it depreciated against the yen by about 13 percent, indicating that the Indonesian authorities are concerned about the stability of the real effective exchange rate of the rupiah, in which the yen must have significant weight.

#### 7.2.5 Philippines

Prior to October 1984, the central bank had intervened to keep the peso-dollar exchange rate within a certain target range. Since then, the value of the peso has in principle been determined freely in the foreign exchange market, though it is apparent that the central bank controls short-run fluctuations in the exchange rate. With the major liberalization of the foreign exchange market in 1992, there is presumably a greater role of market forces in the determination of the exchange rate (Cororaton 1996).

Reflecting the much higher and variable rate of inflation in the Philippines as well as the frequency of changes in the target dollar exchange rate, the real exchange rate of the Philippine peso fluctuated greatly against the U.S. dollar and the Japanese yen. From 1990 to 1995, the peso depreciated against the yen by over 14 percent, while it appreciated against the U.S. dollar by nearly 18 percent in real terms. It is possible that, to the extent that the Philippine authorities have allowed the peso to appreciate substantially against the U.S. dollar



in real terms, they are paying some attention to the real *effective* exchange rate, in which the yen has significant weight.

### 7.2.6 Thailand

The Thai baht was de facto pegged to the U.S. dollar from 1981 to November 1984, when it was devalued by 14.7 percent. The baht was subsequently pegged to a weighted basket of currencies of Thailand's major trading partners. The basket is not disclosed, nor is the frequency with which the basket is changed. It is believed, however, that the weight of the U.S. dollar was raised from about 50 percent to over 80 percent when the U.S. dollar began to depreciate sharply against major currencies from late 1985 (Leeahtam 1991).

In the morning of every business day, the Bank of Thailand announces the central rates of major currencies against the baht. For the U.S. dollar, the buying and selling rates are two satang below and above the central rate. In a recent meeting of the Exchange Equalization Fund, however, the governor of the Bank of Thailand is reported to have announced the possibility of widening the band from the current two satang to four satang on either side of the central rate, in order to discourage short-term speculative capital inflows by increasing the cost of investing in the baht (Phatra Research Institute 1996).

In real terms, the Thai baht remained fairly stable against the U.S. dollar from 1980 to 1985, but it began to appreciate sharply from 1985, when the yen began to appreciate against the U.S. dollar. In contrast, while the baht appreciated against the yen during the earlier period in real terms (reflective of the fact that it was pegged to the appreciating dollar), it remained fairly stable against the yen in real terms from 1986 to 1995. As a result, from 1990 to 1995, the baht appreciated against the U.S. dollar by nearly 30 percent.

## 7.3 Implicit Weights of the U.S. Dollar and the Japanese Yen: A Review of Frankel and Wei (1994) and Kwan (1995)

The widely cited study by Frankel and Wei (1994) was the first to estimate econometrically the implicit weights of the U.S. dollar and the Japanese yen in the determination of the nominal values of major Asian currencies during the period 1979–92. This study was replicated by Kwan (1995) on the basis of more recent data. Their major findings, summarized in table 7.3, seem to show that the dominant weight is given to the U.S. dollar in the determination of all six Asian currencies studied here.<sup>3</sup>

According to Frankel and Wei, however, the weight of the yen, although small, was significant in the Singapore dollar and became larger in the Malaysian ringgit and the Thai baht during the latest subperiod of 1991–92 (not reported in the table). The recently increased weight of the yen is reported by

3. The reported weights do not necessarily add up to unity because there may be other currencies or variables included in the estimation equations, sometimes with negative weights.

**Table 7.3**      **Implicit Weights of the U.S. Dollar and Japanese Yen in Nominal Values of Selected Asian Currencies**

Currency	Frankel and Wei		Kwan			
	January 1979–May 1992 (weekly)		January 1991–May 1995 (monthly)		January–August 1995 (weekly)	
	U.S. Dollar	Japanese Yen	U.S. Dollar	Japanese Yen	U.S. Dollar	Japanese Yen
Korean won	0.96	−0.01	0.9435	0.0623	0.8374	0.1737
Singapore dollar	0.75	0.13	0.6897	0.1052	0.7459	0.1835
Malaysian ringgit	0.78	0.07	0.8411	0.0431	0.8728	0.1561
Indonesian rupiah	0.95	0.16	0.9896	−0.0005	0.9682	0.0102
Philippine peso	1.07	−0.01	1.1464	−0.2359	1.0672	0.0252
Thai baht	0.91	0.05	0.8202	0.1051	0.8593	0.0883

*Sources:* Frankel and Wei (1994) and Kwan (1995).

Kwan for the Korean won, the Singapore dollar, the Malaysian ringgit, and the Thai baht.

### 7.3.1 Korea

According to the estimates of Frankel and Wei based on weekly data for the period January 1979–May 1992, the share of the U.S. dollar in the determination of the Korean won was 0.96 while the share of the Japanese yen was practically zero. In fact, they show that the Korean won remained linked more or less to the U.S. dollar even after the introduction of the MAR system in March 1990. This finding is confirmed for the later period of January 1991–May 1995 by Kwan on the basis of monthly data. However, Kwan reports that for the most recent subperiod of January–August 1995, the weight of the dollar declined to 0.8374, while that of the yen increased to 0.1737.

### 7.3.2 Singapore

According to Frankel and Wei, the Singapore dollar was the only Asian currency that consistently assigned weight to the yen throughout the entire period 1979–92. The weight of the dollar was 0.75, while that of the yen was 0.13, when the weights were calculated for the entire sample. They also show that the weight of the yen doubled in the 1980s from around 5 percent to 10 percent, or from 10 percent to 20 percent, depending on the method of estimation (not reported in the table). For the most recent period, Kwan reports that the weight of the U.S. dollar was 0.7459, while that of the yen was 0.1835.

### 7.3.3 Malaysia

According to Frankel and Wei, the weight of the yen in the Malaysian ringgit was extremely small in the early 1980s, and even disappeared during the rest of the 1980s, but increased to about 14 percent in the early 1990s (not reported in the table). For the entire period, the weight of the yen was 0.07, while that of the dollar was 0.78. For the later subperiod January 1991–May 1995, however, Kwan assigns virtually zero weight to the yen (0.0431), while greater weight is given to the U.S. dollar (0.8411). For the most recent subperiod January–August 1995, the yen's weight rose to 0.1561, while the share of the U.S. dollar was 0.8728.

### 7.3.4 Indonesia

Frankel and Wei report that although the Indonesian rupiah remained tightly pegged to the U.S. dollar until 1982, the dollar peg became looser in 1983. In 1985, the yen received significant weight, so much so that the weight exceeded that of the U.S. dollar for the period 1985–86 (not reported in the table). Subsequently, however, the weight of the yen declined, disappearing altogether during the latest subperiod 1991–92 (not reported in the table). For the entire sample period, the weights of the U.S. dollar and the Japanese yen were estimated to be 0.95 and 0.16, respectively. The insignificant weight of the yen in

more recent years is confirmed by Kwan for the subperiod January 1991–May 1995 as well as for the subperiod January–August 1995.

### 7.3.5 Philippines

Although the peso depreciated significantly against the U.S. dollar throughout the period in nominal terms, the estimated weight of the U.S. dollar (about unity) indicates that the peso was closely linked to the U.S. dollar. This suggests that although the peso was devalued from time to time, its fluctuations against the U.S. dollar were strictly managed over shorter intervals.

### 7.3.6 Thailand

Until 1984, the Thai baht was de facto linked to the U.S. dollar, so that the yen received no weight prior to that year. When the baht was delinked from the dollar, however, the yen began to receive some weight: according to Frankel and Wei, in the neighborhood of 10 percent during 1985–86 when the nominal value of the U.S. dollar was at its peak (not reported in the table). The weight of the yen became smaller during 1987–90 but rose again to 12 percent during the latest subperiod 1991–92 (not reported in the table). For the entire sample, the weights of the U.S. dollar and the Japanese yen were 0.91 and 0.05, respectively. For the more recent subperiod January 1991–May 1995, Kwan reports 0.8202 and 0.1051 as the weights of the U.S. dollar and the yen, respectively.

## 7.4 Movements of Asian Currencies When the Yen Fluctuates Sharply against the U.S. Dollar

While econometric estimation of the implicit weights of the U.S. dollar and the Japanese yen is useful in revealing the relative covariances of the currency in question with the U.S. dollar and the Japanese yen during a particular sample period, it can yield misleading interpretations unless proper caution is exercised. Most important, it must be borne in mind that the econometric approach stresses the covariances between the currency in question and the currencies included in the currency basket without much regard to the magnitude of the underlying changes in currency values. This point is important even if the currency in question is strictly pegged to a currency basket (Thailand) and the composition of the basket remains unchanged, as long as a fluctuation margin is provided around the central rate (Takagi 1988). Naturally, the problem becomes greater in the case of a managed float of more discretionary nature (Korea, Singapore, and Malaysia).

To understand this point, assume, for example, that the authorities of a country care deeply about the nominal stability of the currency against the Japanese yen and hence assign a weight of 10 percent to the yen in the currency basket. If the yen is relatively stable against the U.S. dollar, however, stability against the yen can be secured by simply pegging the currency to the U.S. dollar, presumably the intervention currency, as long as the market rate remains within

the prescribed margins around the theoretical rate. Thus the estimated weight of the yen may turn out to be zero.

On the other hand, if the yen sharply fluctuates against the U.S. dollar in one direction, the policy of pegging the currency to the dollar will result in a sharp movement of the currency against the Japanese yen and may lead to a situation where the market rate goes out of the prescribed margins unless the market rate is changed in line with the weight of the yen in the country's exchange rate policy. The authorities will likely change the dollar rate so as to offset part of the fluctuation of the currency against the yen. In this case, the estimated weight of the yen may approach the theoretical value of 10 percent, or even higher if the maximum margin on both sides is utilized.

Thus, in order to assess the role of the Japanese yen in the exchange rate policies of the Asian countries, it is important not only to look at the econometric estimates of the weights of the dollar and the yen over some sample period but also to examine how the currencies move vis-à-vis the dollar and the yen when the yen fluctuates sharply in one direction against the U.S. dollar. For this purpose, we will next consider twelve episodes of large yen appreciation or depreciation (of at least 5 percent) against the U.S. dollar. There were eight episodes of yen appreciation and four episodes of yen depreciation. Table 7.4 shows how much the Japanese yen and the other Asian currencies appreciated (when the figures are positive) or depreciated (when negative) against the U.S. dollar during each of these twelve episodes.

The numbers in parentheses indicate the direction of change of each Asian currency as a percentage of the movement of the Japanese yen, which can be roughly interpreted as the weight of the yen during that episode.<sup>4</sup> For example, a negative number in parentheses means that the movement of the yen and the movement of the currency in question go in opposite directions relative to the U.S. dollar; a figure of 20, for example, means that the magnitude of the movement of the currency in question is 20 percent of the movement of the yen against the U.S. dollar.

#### 7.4.1 Korea

When the episodes of yen appreciation or depreciation during 1982–95 are individually examined, we find that when the yen depreciated, the won depreciated against the U.S. dollar three out of four times. In these cases of yen depreciation, the weight of the yen ranged between 6 and 43 percent. On the other hand, when the yen appreciated against the U.S. dollar, there were times when the won even depreciated against the U.S. dollar. During the appreciation of

4. Admittedly, this is a crude measure of the weight of the yen because there can be other currencies whose movements are being considered by the authorities. This measure is simply to be taken as a rough indication of how closely the currency in question moved with the yen *ex post*, relative to the U.S. dollar. As another qualification, it should also be noted that this measure may underestimate the "weight" of the yen if the currency in question moves with the yen with a longer lag (Cho 1996).

**Table 7.4 Movements of Selected Asian Currencies against the U.S. Dollar during Periods of Sharp Yen-Dollar Exchange Rate Change**

Period	Japanese Yen	Korean Won	Singapore Dollar	Malaysian Ringgit	Indonesian Rupiah	Philippine Peso	Thai Baht
1. October 1982 to March 1984	21.0	-6.1 (-29)	5.7 (27)	2.7 (13)	-38.4 (-183)	-46.1 (-219)	0.0 (0)
2. March 1984 to February 1985	-14.4	-6.2 (43)	-8.0 (55)	-11.9 (83)	-8.8 (61)	-27.1 (188)	-19.9 (138)
3. August 1985 to September 1986	43.5	1.1 (2.6)	4.5 (10)	-5.6 (-13)	-37.8 (-87)	-9.5 (-22)	3.0 (6.8)
4. November 1986 to April 1987	15.2	3.6 (24)	3.5 (23)	4.9 (32)	0.6 (3.6)	-0.2 (-1.5)	2.6 (17)
5. September 1989 to April 1990	-13.5	-5.4 (40)	4.4 (-32)	-1.1 (8.0)	-2.6 (19)	-3.8 (29)	-0.9 (6.3)
6. June 1990 to October 1990	16.7	0.3 (1.8)	7.6 (46)	0.4 (2.2)	-1.5 (-9.0)	-10.1 (-61)	2.8 (16)
7. September 1991 to December 1991	5.9	-2.6 (-43)	3.6 (60)	0.7 (11)	-0.5 (-7.7)	1.3 (22)	-0.2 (-2.7)
8. April 1992 to September 1992	11.3	-1.0 (-8.8)	3.9 (34)	1.2 (11)	-0.8 (-7.0)	2.7 (24)	2.1 (19)
9. December 1992 to August 1993	18.0	-2.5 (-14)	2.4 (13)	2.5 (14)	-1.9 (-11)	-11.1 (-62)	1.4 (7.7)
10. August 1993 to December 1993	-7.1	0.04 (-0.5)	-0.1 (2.0)	-5.8 (82)	-0.4 (5.4)	1.2 (-17)	-1.5 (21)
11. December 1993 to May 1995	29.6	6.1 (21)	12.5 (42)	9.1 (31)	-5.8 (-20)	7.1 (24)	3.6 (12)
12. May 1995 to September 1995	-16.7	-1.1 (6.5)	-0.1 (0.6)	-1.7 (10)	-1.7 (10)	1.0 (-6.2)	-1.8 (11)

Source: IMF, *International Financial Statistics* (Washington, D.C., various issues).

Note: On the basis of end-of-month data; a positive number means an appreciation of the currency in question against the U.S. dollar. Numbers in parentheses indicate the direction of change of each currency as a percentage of the movement of the Japanese yen.

the yen in December 1993–May 1995, however, the won also appreciated against the U.S. dollar, with the implicit weight of the yen in the determination of the won corresponding to 21 percent.

#### 7.4.2 Singapore

When the currency value of the yen changed sharply against the U.S. dollar, the weight of the yen in the determination of the Singapore dollar was consistently significant throughout the period, with the weight ranging between 10 and 55 percent. However, there were two exceptions: the Singapore dollar appreciated against the U.S. dollar by 4 percent during September 1989–April 1990, when the yen depreciated by 13 percent; and it remained stable against the U.S. dollar during May–September 1995, when the yen depreciated by almost 17 percent.

#### 7.4.3 Malaysia

In terms of individual episodes, the weight of the yen in the determination of the ringgit became consistently significant after the episode of November 1986–April 1987. The weight ranged between 8 and 32 percent.

#### 7.4.4 Indonesia

The yen even had a negative weight during August 1985–September 1986, meaning that the rupiah depreciated against the U.S. dollar when the yen significantly appreciated against the U.S. dollar. The rupiah generally depreciated against the U.S. dollar whenever the yen depreciated against the U.S. dollar. The weight of the yen for the most recent episode (May–September 1995) was about 10 percent, but this may simply reflect the fact that the yen depreciated against the U.S. dollar when there was a trend depreciation of the rupiah.

#### 7.4.5 Philippines

Consistent with the fact that the peso depreciated against the U.S. dollar in nominal terms during this period, the yen and the peso generally moved in the same direction only when the yen depreciated against the U.S. dollar. The implicit weight of the yen becomes larger when the magnitude of the yen's movement against the U.S. dollar is small. On the other hand, the implicit weight becomes small (or negative) when the yen's movement against the dollar is large, indicating that the yen plays little role in the peso's nominal exchange rate determination.

#### 7.4.6 Thailand

When the individual episodes are considered, it becomes clear that the weight of the yen in the determination of the baht was between 7 and 19 percent during 1985–95. The order of magnitude of these implied weights is similar to the econometrically estimated weights. Together with the fact that the weight of the yen was apparently symmetrical with respect to appreciation and

depreciation, this seems to suggest that the Thai baht is pegged fairly strictly to a basket of currencies, in which the weight of the yen is stable.

## **7.5 Daily Movements of Asian Currencies during Periods of Sharp Yen Appreciation and Depreciation in the 1980s**

In the first half of the 1980s, the yen-dollar exchange rate fluctuated in the range of 200–270 yen per dollar, with the yen showing general weakening against the dollar from the middle of 1984 through the early part of 1985. Following the Plaza Agreement of 22 September 1985, however, the yen began to appreciate sharply from the pre-Plaza level of around 240 to reach the level of almost 200 yen per dollar in two months. The appreciation of the yen, from 19 September to 25 November, amounted to almost 20 percent. The yen continued its trend appreciation throughout the rest of the 1980s, except for one notable period of substantial reversal from the latter part of 1988 through the first part of 1989. Somewhat more gradually than on other occasions, the yen depreciated from the high of 120.9 yen per dollar on 24 November 1988 to the low of 149.6 yen per dollar on 15 June 1989, a depreciation of almost 20 percent.

This section will take a detailed look at the daily movements of the Japanese yen and the Asian currencies against the U.S. dollar during the period immediately following the Plaza Agreement of 1985 (fig. 7.1) and a portion of the latter period of yen depreciation, namely, from 3 January to 14 June 1989 (fig. 7.2).<sup>5</sup>

### **7.5.1 Korea**

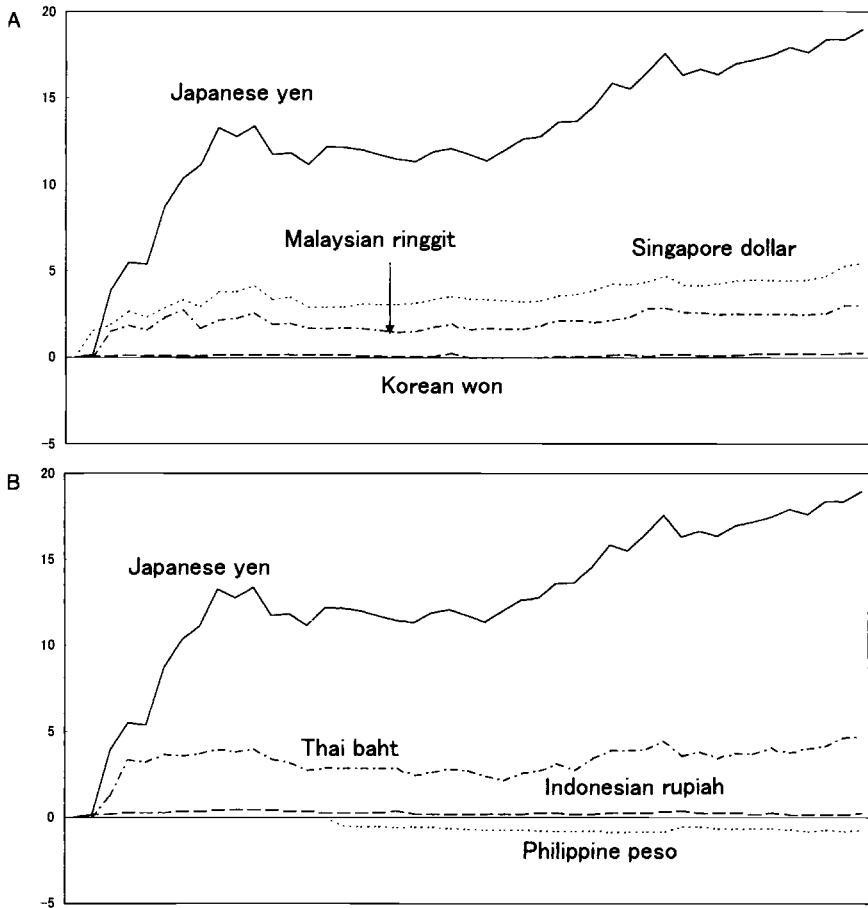
During the first period when the yen was appreciating against the U.S. dollar, the Korean won remained virtually pegged to the dollar. During the second period of sharp yen depreciation, the won moderately appreciated against the dollar. In neither period is there evidence to suggest that the Korean authorities were paying much attention to the movement of the won against the yen.

### **7.5.2 Singapore**

During the first period of sharp yen appreciation, the Singaporean authorities allowed the Singapore dollar to appreciate along with the yen against the U.S. dollar. The cumulative appreciation of the Singapore dollar over this period was almost 5 percent, as opposed to almost 20 percent for the yen. In contrast, when the yen depreciated in the early part of 1989, the Singapore dollar remained stable against the U.S. dollar, underscoring the importance the Singaporean authorities attach to price stability.

5. Daily exchange rate data were obtained from the *Asian Wall Street Journal*. Exchange rates for 1985 are mid rates at 5 P.M. in Hong Kong, while those for 1989 are selling rates at 3 P.M. in New York.





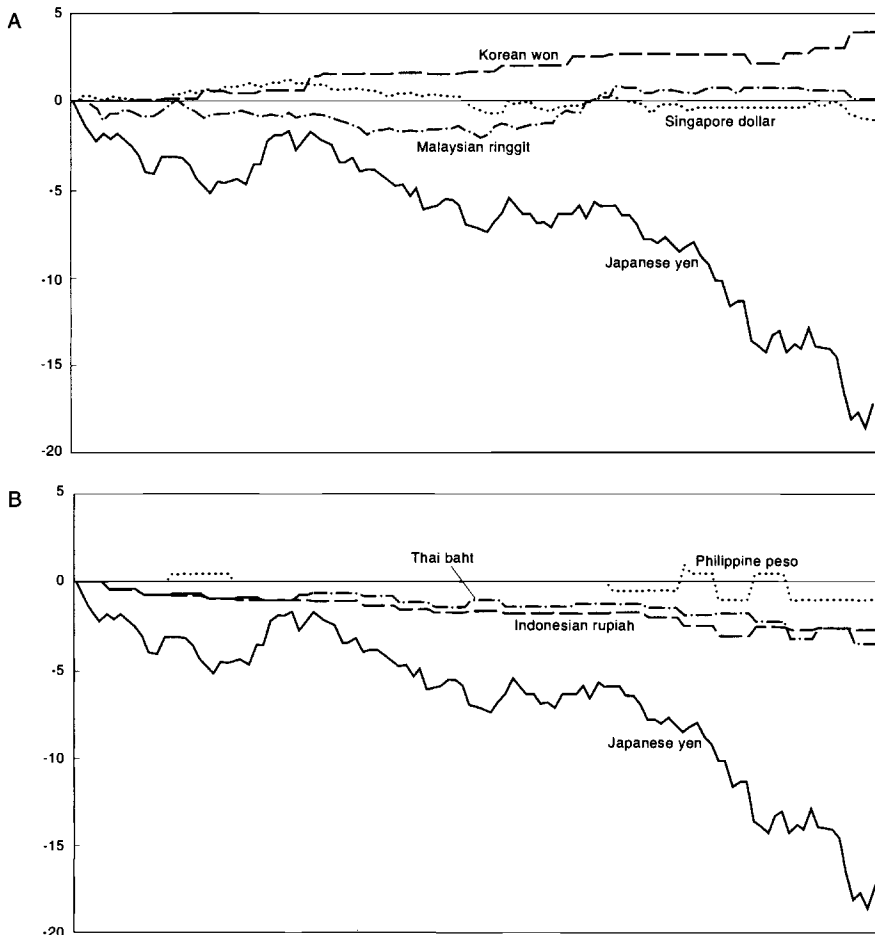
**Fig. 7.1** Daily movements of selected Asian currencies against the U.S. dollar during the period of sharp yen appreciation 19 September to 25 November 1985  
*Note:* A, Korean won, Singapore dollar, and Malaysian ringgit. B, Indonesian rupiah, Philippine peso, and Thai baht. Logarithmic change in basis points.

### 7.5.3 Malaysia

During the period of yen appreciation, the Malaysian authorities allowed the ringgit to appreciate moderately along with the yen against the U.S. dollar. In contrast, during the time of yen depreciation, the ringgit initially depreciated somewhat but subsequently appreciated marginally. On both occasions, the movement of the ringgit was similar to that of the Singapore dollar.

### 7.5.4 Indonesia

On the first occasion of yen appreciation, the Indonesian rupiah remained stable against the U.S. dollar, indicating that the rupiah was effectively pegged



**Fig. 7.2 Daily movements of selected Asian currencies against the U.S. dollar during the period of sharp yen depreciation 3 January to 14 June 1989**

*Note:* A, Korean won, Singapore dollar, and Malaysian ringgit. B, Indonesian rupiah, Philippine peso, and Thai baht. Logarithmic change in basis points.

to the U.S. dollar over this interval. When the yen depreciated in 1989, however, the rupiah moderately depreciated.

### 7.5.5 Philippines

On both occasions, the Philippine peso was virtually pegged to the U.S. dollar.

### 7.5.6 Thailand

When the yen appreciated, the Thai authorities allowed the baht to appreciate moderately along with the yen against the U.S. dollar; when the yen depre-

ciated, they depreciated the baht slightly along with the yen against the U.S. dollar. From these two episodes, it appears that the Thai authorities strictly adhered to a basket peg and that the weight of the yen in the currency basket was reduced somewhat somewhere between 1985 and 1987, presumably in the light of the appreciating trend of the yen.

## **7.6 Daily Movements of Asian Currencies during Periods of Sharp Yen Appreciation and Depreciation in 1995**

In 1995, the Japanese yen moved sharply against the U.S. dollar on two occasions. On the first of these occasions, from 1 March to 19 April, the yen appreciated against the U.S. dollar by over 15 percent, rising from 96.75 to 81.08 yen per U.S. dollar (fig. 7.3). On the second occasion, from 1 August to 19 September, the yen reversed its position against the U.S. dollar by depreciating by more than 15 percent, declining from 88.29 to 104.20 yen per U.S. dollar (fig. 7.4).<sup>6</sup> These two periods may be instructive in revealing not only the reactions of the monetary authorities but also how they might have changed since the 1980s.

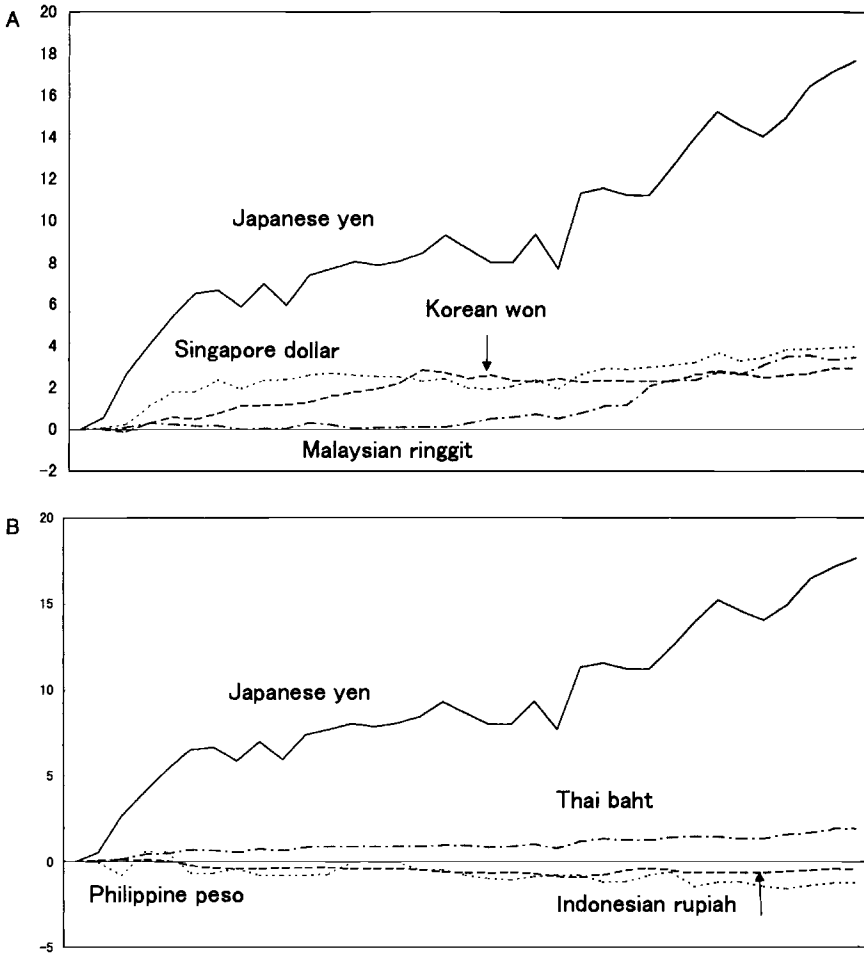
### **7.6.1 Korea**

When the yen fluctuated sharply against the U.S. dollar in either direction, the Korean authorities initially kept the won-dollar exchange rate stable. It appears that a substantial adjustment of the won-dollar exchange rate takes place only after it is determined that the movement of the yen against the dollar is significant and more or less permanent. It is interesting to note that when the yen sharply depreciated against the dollar from 14 to 17 August (by as much as 5 percent in three days), the Korean authorities immediately reacted by depreciating the won (from 761.75 won per U.S. dollar on 15 August to 787.65 won on 18 August), indicating the greater weight they assign to a depreciating yen. It is clear that the depreciation of the Korean won in August 1995 was deliberate as the balance of foreign exchange reserves was increasing during this period.

### **7.6.2 Singapore**

When the yen appreciated, the Singaporean authorities allowed the Singapore dollar to appreciate moderately along with the yen against the U.S. dollar. When the yen depreciated, however, the authorities kept the nominal value of the Singapore dollar virtually constant against the U.S. dollar for two full business weeks before allowing the Singapore dollar to depreciate moderately in response to a further depreciation of the yen. This may reflect the importance

6. Daily exchange rate data, except for the Indonesian rupiah, were obtained from the *Financial Times*. The exchange rates are closing mid rates in London. Daily data for the rupiah were obtained from the *Wall Street Journal*. The exchange rates are selling rates at 3 P.M. in New York.



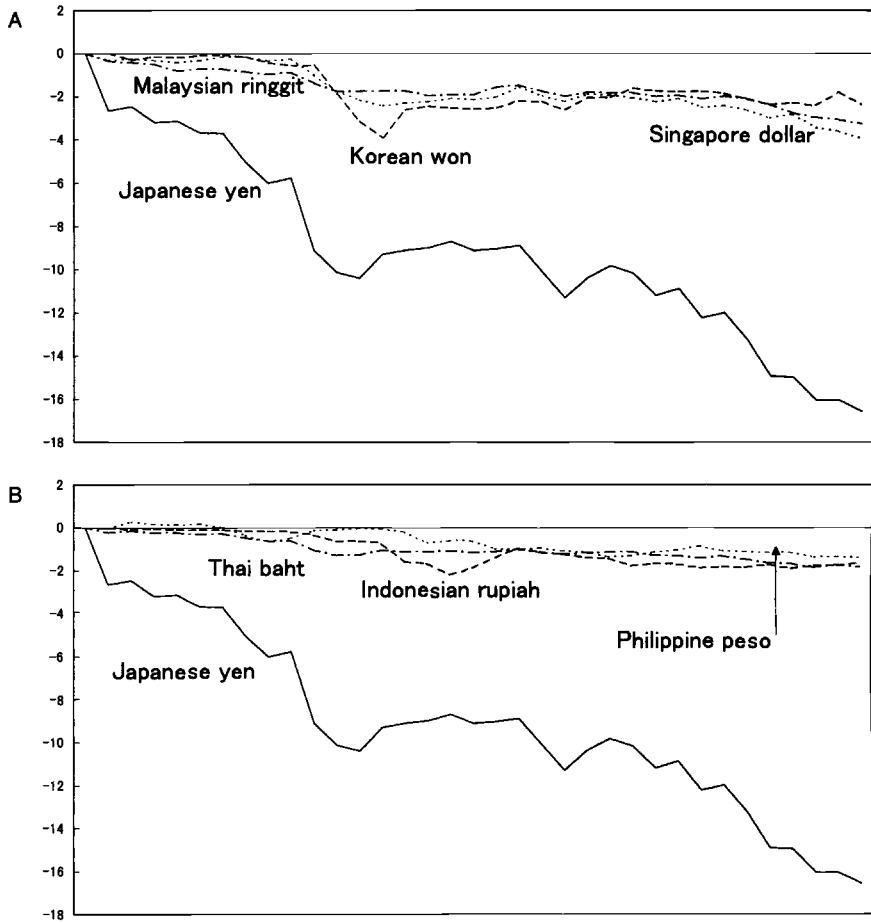
**Fig. 7.3 Daily movements of selected Asian currencies against the U.S. dollar during the period of sharp yen appreciation 1 March to 19 April 1995**

*Note:* A, Korean won, Singapore dollar, and Malaysian ringgit. B, Indonesian rupiah, Philippine peso, and Thai baht. Logarithmic change in basis points.

of price stability in Singapore’s exchange rate policy, hence the greater resistance to exchange rate depreciation and the greater propensity to accommodate the yen’s exchange rate appreciation.

### 7.6.3 Malaysia

On a daily basis, Malaysia’s policy response was quite asymmetric with respect to the yen’s depreciation and appreciation. When the yen appreciated in March 1995, the nominal value of the ringgit remained extremely stable for



**Fig. 7.4** Daily movements of selected Asian currencies against the U.S. dollar during the period of sharp yen depreciation 1 August to 19 September 1995

*Note:* A, Korean won, Singapore dollar, and Malaysian ringgit. B, Indonesian rupiah, Philippine peso, and Thai baht. Logarithmic change in basis points.

most of the period, although it began to appreciate moderately against the U.S. dollar during the very last part of the yen's appreciation phase. When the yen depreciated in August, however, the ringgit depreciated immediately against the U.S. dollar so as to offset a portion of its appreciation against the yen.

#### 7.6.4 Indonesia

The nominal value of the Indonesian rupiah remained fairly constant against the U.S. dollar on both occasions. In fact, it continued to depreciate against the

U.S. dollar at a moderate pace regardless of the movement of the yen against the dollar.

#### 7.6.5 Philippines

The behavior of the Philippine peso was similar to that of the Indonesian rupiah. Regardless of how the yen moved against the U.S. dollar, the peso remained on a moderately depreciating trend against the dollar.

#### 7.6.6 Thailand

The Thai baht's movement was symmetrical with respect to the yen's appreciation and depreciation. In both cases, the baht moved so as to offset a portion of its movement against the yen, indicative of the policy of the Thai authorities to peg the baht fairly strictly to a currency basket, of which the yen is a component. Judging from the movement of foreign exchange reserves (not reported here), it is most likely that the Thai authorities sold foreign exchange in the market during the period of yen appreciation (so as to appreciate the baht), while they purchased foreign exchange during the period of yen depreciation (so as to depreciate the baht).

### 7.7 Conclusion

By looking at how six East Asian currencies moved when the yen fluctuated sharply against the U.S. dollar during 1980–95, we have found that the reaction was sometimes much more significant than would be suggested by the econometric estimates of the yen's weight in the determination of their nominal values. When the individual episodes of sharp yen fluctuation were examined, the "weight" of the yen often appeared larger than most of the econometric estimates taken from a longer sample period. The exceptions were the Indonesian rupiah and the Philippine peso, both of which showed secular depreciation against the U.S. dollar over the period. Clearly, the paramount objective of the Indonesian and Philippine exchange rate policies was to prevent a real appreciation of their currencies in the light of higher domestic inflation by consistently depreciating their currencies in nominal terms. In these countries, little attention was paid to the movement of the yen, although it is evident that the yen is prominently included in the real effective exchange rate indexes.

Except for Thailand, which strictly adheres to a basket peg, the other countries have more recently shown asymmetric responses to the yen's depreciation and appreciation. The Singapore dollar has tended to move more closely with an appreciating yen, underscoring the importance the authorities attach to price stability in their exchange rate policy. On the other hand, the Korean won and the Malaysian ringgit have tended to move more closely with a depreciating yen, suggesting an emphasis on export promotion. In this sense, the yen is

perceived in Korea and Malaysia as the currency of a competitor country in the export market.<sup>7</sup>

In contrast to Korea, which has demonstratively become Japan's competitor in the world market for manufactures, the case for Malaysia as a competitor of Japan may sound a little farfetched. To be sure, Malaysia's manufacturing exports are not as voluminous as Korean exports, nor do they compete as directly with Japanese exports. In terms of growth in recent years, however, Malaysia has considerably raised its status as an exporter of manufactured goods. For example, from 1989 to 1994, Malaysia's export of Sections 6 and 7 manufactured goods (as classified by the Organization for Economic Cooperation and Development [OECD]) to the United States increased fourfold from \$3 billion to \$12 billion, while Japan only marginally increased its export of similar goods from \$91 billion to \$112 billion during the same period (OECD 1994). It is thus possible that in tying the currency more to a depreciating yen, the Malaysian authorities were protecting the gains being made in manufacturing exports.

Emphasis on export promotion produces more convergent movement with a depreciating yen and more divergent movement with an appreciating yen. Conversely, emphasis on price stability produces more convergent movement with an appreciating yen and more divergent movement with a depreciating yen. As things have turned out, because the yen showed sustained and significant appreciation against the U.S. dollar for the sample period as a whole, an exchange rate policy targeted at price stability has contributed more to monetary cooperation in Asia, by promoting intraregional exchange rate stability, than a more competitive exchange rate policy targeted at export promotion.

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7. Although it is likely that the industrial composition of Korean exports is similar to that of Japanese exports, it is not clear to what extent Malaysian exports compete with Japanese exports. The characterization of the behavior of the Malaysian ringgit as "competitive" relative to the yen remains only tentative.

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## Comment      Tetsuji Okazaki

Since Frankel and Wei's pioneering paper of 1994, currency blocs have come to be a subject of quantitative research. Takagi's paper joins this line of research and makes a new contribution. He pays attention to the movements of the exchange rates of selected Asian countries in cases when the yen fluctuated sharply against the U.S. dollar. He takes up twelve cases of large yen fluctuation against the dollar from 1982 to 1995, of which eight were yen appreciation and four were yen depreciation. The main finding of the paper is that the exchange rates of some countries responded to sharp yen fluctuations asymmetrically between the cases of depreciation and appreciation. That is, the exchange rates of the Korean won and the Malaysian ringgit moved more in line with the yen against the U.S. dollar when the yen depreciated than when it appreciated. On the other hand, the exchange rate of the Singapore dollar moved more in line with the yen against the U.S. dollar when the yen appreciated than when it depreciated. Takagi interprets this asymmetry as reflecting the policy of each currency authority. The Korean and Malaysian authorities regard the yen as the currency of a competitor country, while the authority of Singapore makes much of stability of prices. The asymmetrical responses of the exchange rates are phenomena that have not been given much attention in the research since the Frankel and Wei paper, and this finding is a substantial contribution.

However, there remains some room for consideration in the author's interpretation of the asymmetry, because we can derive another implication from table 7.4 in the paper. In table 7.4 he takes the U.S. dollar as numéraire. If we take the yen as numéraire in this table, we can say that the exchange rates of



the Korean won and Malaysian ringgit moved more in line with the U.S. dollar against the yen when the U.S. dollar depreciated than when it appreciated. Also we can say that the exchange rate of the Singapore dollar moved more in line with the U.S. dollar against the yen when the U.S. dollar appreciated than when it depreciated. In sum, the Korean and Malaysian authorities are inclined to depreciate their currencies in both the case of yen depreciation against the U.S. dollar and the case of U.S. dollar depreciation against the yen. And the Singapore authority is reluctant to depreciate its currency in both the case of yen depreciation against the U.S. dollar and the case of U.S. dollar depreciation against the yen. Therefore, it is true that the Singapore authority places more importance on price stability. On the other hand, the Korean and Malaysian authorities' responses shown in table 7.4 might not be due to their perception of Japan as a competitor country but might reflect a more general policy of export orientation.

Takagi further interprets the asymmetrical responses as revealing different roles of the yen with respect to each currency, that is, competition and cooperation, which is the subtitle of his paper. Aside from the above-mentioned problem, the asymmetry can be interpreted as reflecting the relationship between the industries of Japan and those of each Asian country. For example, the leading industries of Korea and Japan are substitutive, while those of Singapore and Japan are complementary. However, there is some distance between the relationship of the industries of the two countries and the relationship of their currencies.

## Comment K. C. Fung

I find this paper very interesting. It takes another look at how much currencies of some Asian countries (South Korea, Singapore, Malaysia, Indonesia, the Philippines, and Thailand) respond to changes in the Japanese yen and the U.S. dollar. The contribution of the paper is its focus on the reactions of these currencies during episodes when the yen moved sharply against the U.S. dollar. The paper also examines movements of the Asian currencies *both* when the yen depreciates and when the yen appreciates against the U.S. dollar.

I think one important motivation for focusing on episodes of large exchange rate changes is that large fluctuations of the yen can have persistent effects on these Asian economies (Baldwin and Krugman 1986). Confronted by possible long-term effects, the central banks of these countries may feel that they have no choice but to reveal, clarify, and pursue their objectives through their ex-

change rate policies. The paper shows that some currencies (such as the South Korean won) behaved quite differently when the yen appreciated as compared to when the yen depreciated. This *asymmetric* behavior gives us additional insight into the goals of the exchange rate policies of these countries.

By and large, I interpret the results of the paper to be consistent with earlier studies that show that currencies of East Asian countries (other than Japan) are pegged de facto to the U.S. dollar and with few exceptions place little weight on the role of the Japanese yen. In addition to the work by Frankel and Wei (1994) cited in the paper, Ito (1994), for example, found evidence that while countries in Asia are gradually expanding their use of the yen as an invoice currency, most still rely mainly on the U.S. dollar. In fact, it was pointed out that in invoicing import and export transactions, other developed countries use their own national currencies far more than Japan uses the yen.

The de facto pegging of the Asian currencies to the U.S. dollar may reflect the underlying choices that these governments and their central banks had to make. Since 1985, two events put pressure on real exchange rates to appreciate in Asia. First, between 1985 and 1987, the U.S. dollar sharply depreciated against major currencies, including the Japanese yen and the German deutsche mark. This improved the export competitiveness of these Asian economies, which led to large increases in their trade balances. Second, U.S. interest rates declined between 1989 and 1993. This encouraged capital to flow to regions like Asia.

Faced with these conditions, governments could have allowed their nominal exchange rates to appreciate, which would have reduced exports, or they could have taken measures to maintain their nominal exchange rates, which would have led to more inflation. Basically, most of the Asian governments chose to pay attention to their export competitiveness. Because their major export market is the United States, these governments took steps to avoid sharp appreciation of their nominal exchange rates against the U.S. dollar. The choice between export competitiveness and inflation facing these economies is illustrated by the different strategies pursued by the Hong Kong and Singaporean governments. Hong Kong apparently is more interested in its export competitiveness. The Hong Kong dollar has been pegged to the U.S. dollar, and since 1985 it has had cumulative inflation of more than 50 percent relative to that in the United States. In contrast, Singapore seems to be more concerned with inflation. The government of Singapore allowed its nominal exchange rate to go up by about 50 percent against the U.S. dollar. Since 1985, cumulative inflation has been 20 percent lower than in the United States (Glick and Moreno 1995).

The paper also highlights an interesting micro question about the use of currency in international trade. The question is: as East Asia conducts more trade with Japan, why do we not see any significant increase in the use of the Japanese yen? Part of the answer may lie in the nature and the character of trade rather than just the total volume of trade. In an earlier NBER–East Asia

Seminar study, Urata (1993) documented that a significant fraction of East Asia–Japan trade is intrafirm trade and that Japanese affiliates in East Asia tend to export a large share of their final goods to the U.S. market. Since it has been documented that Japanese firms continue to conduct their international trade in U.S. dollars (Ito 1994), it should not be surprising that even as the volume of trade with Japan increases, the use of the Japanese yen in East Asia does not proportionally expand.

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