



Munich Personal RePEc Archive

Exchange rate management in selected East Asian countries after the financial crisis

Taguchi, Hiroyuki

Saitama University, Japan

2002

Online at <https://mpra.ub.uni-muenchen.de/63785/>

MPRA Paper No. 63785, posted 21 Apr 2015 18:56 UTC

論文

Exchange Rate Management in Selected East Asian Countries After the Financial Crisis

Hiroyuki Taguchi[†]

I. Introduction

Exchange rate management is one of the central issues of macroeconomic policies. Since the postwar period, there has been a long-term debate over the merits of fixed versus floating exchange rates. The debate, which is typically framed in terms of the trade-off between credibility and flexibility, has gone through several swings of the pendulum. Recently, the debate on exchange rate regimes has become focused on whether or not the intermediate regimes such as target zones, crawling and basket pegs are vanishing, in other words, whether or not exchange rate regimes are moving to a corner solution with the "hard peg" or the "free float". So far, no clear consensus has been reached.

The 1997-98 Asian crisis has refocused attention on exchange rate management of East Asian countries. Most views expressed criticize the pre-crisis US dollar-pegged-rate regime as one of the causes of the crisis. It is said that this regime induced short-term external over-borrowing and caused the appreciation of real exchange rates with the loss of competitiveness. Then, the question arises as to whether, after the crisis, the East Asian countries are simply returning to the pre-crisis US dollar standard, or whether they have learned a lesson from the crisis and are finding another path to follow.

This article examines post-crisis exchange rate management in selected East Asian countries in terms of exchange rate regimes and targeting. The main findings from our empirical studies are as follows: As far as can be seen from the recent developments of exchange rate arrangements in countries analyzed according to the IMF classification, it appears that the hypothesis of the corner solution with a "hard peg" or "free float" has taken hold in the post-crisis period. However, when we analyze the de facto regimes by examining the volatilities of foreign exchange reserves, we can speculate that the countries analyzed, except for Malaysia, are in fact holding to the "soft peg" even in the post-crisis period, regardless of their announcement in favor of the "free float". The next issue to consider is what kind of factors determine the targeted reference rate. Post-crisis exchange rate targeting appears to be somewhat different from the simple US dollar standard in the pre-crisis period. Empirical evidence shows that some countries have come to value inflation adjustment in exchange rate targeting in addition to the US dollar linkage during the post-crisis period.

The rest of the paper is organized as follows: Section II reviews the previous studies on exchange rate regimes. In this section, first we present an outline of the long-term debate over fixed versus

[†]早稲田大学社会科学研究所 博士課程3年

floating exchange rates since the postwar period. Second, we focus on recent studies: the debate over the corners hypothesis versus the "Fear of Floating" hypothesis; and the reviews on assessments of exchange rate management of East Asian countries in pre- and post- crisis. Section III conducts empirical studies. In this section, we first review recent developments of exchange rate regimes in the sample countries according to IMF classification. Second, we analyze the de facto exchange rate regimes by examining the volatilities of foreign exchange reserves in the sample countries. Third, we analyze the factors determining the targeted reference rates in managing exchange rates, both by investigating the real effective exchange rate movements and by conducting regression analysis. Section IV presents concluding remarks. In this section, we also indicate what issues remain to be analyzed.

II. Previous Studies

In this section, we review the previous studies on exchange rate regimes. First, we show a bird eyes' view of the long-term debate over fixed versus floating exchange rates since the postwar period. Second, we focus on recent studies: the debate over the corners hypothesis versus the "Fear of Floating" hypothesis, and the reviews of the assessments of exchange rate management of East Asian countries in pre- and post- Asian crisis.

A. Long-term Debates: Fixed versus Floating Exchange Rates

We first present the long-term debate over the merits of fixed versus floating exchange rates since the postwar period¹⁾. The debate is typically framed in terms of the trade-off between credibility and flexibility. With the adoption of a fixed regime, domestic monetary policy is dictated by the central bank of the country whose currency provides the external anchor, and the fixed rate automatically acquires all the credibility accumulated by the issuer of the anchor currency. Floating rates, in contrast, maximize the flexibility with which the authorities can use monetary policy for economic stabilization. They leave the central bank free to intervene as a lender of last resort to financial markets.

The debate has gone through several swings of the pendulum. At the time of Bretton Woods, the architects of the postwar system favored fixed exchange rates, attributing the economic instability of the interwar period, in part, to flexible rates. During the 1960s, a growing number of economists came to favor floating rates, responding to the widening US balance-of-payments disequilibrium that led to the breakdown of the Bretton Woods system. During the 1980s, the accumulating experience with high inflation in many parts of the world brought the pendulum back. Setting a target for the exchange rate came to be viewed as one way for central banks to realize monetary stabilization. New theories of rational expectation and dynamic consistency concluded that a commitment to such a nominal anchor, if credible, would even allow disinflation without the usual costs of lost output and employment. In the late 1990s we faced the second complete swing of the pendulum out and back, as conventional wisdom blamed exchange rate targets for crises in Mexico (1994-95), East Asia (1997-98), Russia (1998), and Brazil (1999). In this context, has come the new proposition that countries are -or should be- moving to the corner solutions²⁾.

B. Recent Studies

We here focus on recent studies on exchange rate regimes: First, we review the recent debate over the corners hypothesis versus the "Fear of Floating" hypothesis. Second, we concentrate on reviews of assessments of the exchange rate management of East Asian countries in pre- and post- Asian crisis.

B-1. Corners Hypothesis Versus "Fear of Floating" Hypothesis

The hypothesis of corner solutions involves opting either, on the one hand, for full flexibility, or, on the other, for rigid institutional commitments to fixed exchanges in the form of currency boards or full monetary union with the dollar or euro. It is said that the intermediate exchange rate regimes such as the target zones, crawling and basket pegs, are no longer feasible and are going to disappear.

ADB (2001) identified the reasons for this as follows: Large and liquid international capital markets make it more difficult for national authorities to support a shaky currency peg, since the resources of the markets far outstrip the reserves of even the best-armed central banks and governments. Effective defense of exchange rates requires raising interest rates and restricting domestic credit, something that will have significant costs especially in emerging market economies with their fragile financial and political systems. Frankel et al. (2000) offered a theoretical rationale for the corners hypothesis by introducing the notion of "Verifiability" and suggested that a simple peg or a simple float may be more verifiable by market participants than a more complicated intermediate regime. They also offered some empirical evidence that intermediate regimes do in fact inspire less credibility than institutional arrangements such as dollarization³.

Calvo and Reinhart (2000), on the contrary, insisted that a careful reading of the evidence on exchange rate policy presents a strikingly different picture; countries that say they allow their exchange rate to float mostly do not - there seems to be an epidemic case of the "fear of floating", particularly among emerging market economies. They presented an analytical model that suggests that, even in the best of times, when countries retain voluntary access to international capital markets, lack of credibility will lead to the "fear of floating". They also found, in their empirical analyses across 154 exchange rate arrangements, a low variability of exchange rates and a high volatility of central bank reserves that suggest significant central bank intervention.

B-2. Assessments of Recent East Asian Exchange Rate Management

We next focus on assessments of exchange rate management of East Asian countries in pre- and post- Asian crisis. We first summarize the views of international organizations on the pre-crisis US dollar-pegged-rate regimes, most of which blame the regime as one of the causes of the crisis.

The World Bank (1998) stated that in most of the ASEAN countries, informal pegging to the US dollar that makes nominal rate predicable, encouraged unhedged short-term external borrowing due to large interest rate differentials. They also added that to further complicate matters, the yen depreciated against the US dollar throughout much of 1996, so the pegged currencies lost competitiveness against the important yen market. Along this line, the World Bank (2000) suggested that a flexible exchange rate absorbs shocks from capital inflows and outflows.

One of the factors of the Asian crisis, identified by the IMF (1998), was the excessively long maintenance of pegged exchange rate regimes, which complicated the response of monetary policy to

overheating pressures, and which came to be viewed as implicit guarantees of exchange value, encouraging short-term external borrowing and leading to excessive exposure to foreign exchange risk. They suggested that adjustable pegs have become increasingly difficult to maintain in the face of large-scale financial flows, and that for some economies, the balance of costs and benefits may be shifting in favor of greater exchange rate flexibility, partly because of the advantages of avoiding the risk that a fixed rate may encourage excessive foreign currency exposure.

ADB (1998) explained that the pegged exchange rate contributed to the current account deficits and rising real exchange rates, the combination of which provided a vital ingredient for the financial crisis. They attributed the rising real rate to a combination of factors that included higher domestic inflation in relation to the world average; appreciation of the US dollar, to which these currencies were pegged; depreciation of the Japanese yen; and devaluation of the PRC currency in 1994. They also pointed out that the high interest rates of the affected countries, along with pegged exchange rates, created a false sense of security among many investors that they could earn relatively high rates of return without any exchange rate risk.

Most of the views criticize the pre-crisis US dollar-pegged-rate regime because of its moral hazard in inducing short-term external borrowing and its tendency to cause the appreciation of real exchange rates with the loss of competitiveness. They also favor greater exchange rate flexibility⁽⁴⁾. The next question is how post-crisis exchange rate management is evaluated. In spite of the suggestion of greater flexibility, not all East Asian countries seem to prefer the same exchange rate arrangement and assessment does not always seem to reach clear-cut consensus. Calvo and Reinhart (2000), again, shows that many countries that are categorized as having floating currencies since the Asian crisis are, in effect, holding loose pegs. Mckinnon (2001) analyzed how the post-crisis exchange rate regime has evolved since 1998. According to his analyses, dollar exchange rates, particularly when observed on a high-frequency (daily) basis, have become as stable as they were before the crisis. Therefore, he stated that the East Asian dollar standard, except for Indonesia, seems to be resurrecting itself, and that the "fear of floating" identified by Calvo and Reinhart (2000) is shown at higher frequencies to be a rational response to capital market conditions in emerging markets.

III. Empirical Studies on Selected East Asian Countries

We conducted an empirical analysis of the selected East Asian countries. We here focus, as sample countries, on the hardest-hit crisis countries among the East Asian countries: Indonesia, the Republic of Korea, the Philippines, Malaysia, and Thailand. First, we briefly review recent developments of exchange rate regimes in the sample countries according to the IMF classification. Second, we analyze the de facto exchange rate regimes by examining the volatilities of foreign exchange reserves in the sample countries. Third, we analyze the factors determining the targeted reference rates in managing exchange rates both by investigating the real effective exchange rate movements and by conducting regression analysis.

A. Developments of Exchange Rate Regimes in IMF Classification

We first analyze the developments of exchange rate arrangements in the sample countries from the

pre-crisis period to the post-crisis period from information obtained from the IMF (International Monetary Fund).

According to Table 1, we observed the following: First, Indonesia and Korea moved from Managed Float to Independent Float. Thailand moved from Pegged to Currency Composite through Managed Float to Independent Float. Second, Malaysia, on the contrary, shifted from Managed Float to Pegged to US dollar in 1998. Third, the Philippines showed no change, staying at Independent Float. Fourth, although the IMF has adopted the new exchange rate classification system since 1999⁽⁵⁾, any significant changes in classification have not occurred in the sample countries.

From the observation above and considering that Hong Kong and China have adopted pegs, the East Asian arrangements seem apparently to go along with the hypothesis of corner solutions, "hard peg" or "free float"⁽⁶⁾. As we stated before in II-B, however, some economists argue that some countries that announced "free float" seem to be returning to "soft peg", from their empirical studies. We will verify this point in the following section.

B. De Facto Exchange Rate Regimes: Returning to "soft peg"

Calvo and Reinhart (2000) showed, as key evidence of the "fear of floating", that in the countries that say they allow their exchange rate to float, the foreign exchange reserve volatility is very high, contrary to what would be expected in a floating exchange rate regime, which suggests significant

Table 1 Developments of Exchange Rate Arrangements

	Indonesia	Korea	Malaysia	Philippines	Thailand
1993 II	FM	FM	FM	FI	PCC
~	↓	↓	↓	↓	↓
1997 III	FI	FI			FM
~	↓	↓	↓	↓	↓
1998 I					FI
~	↓	↓	↓	↓	↓
1998 III			PUS		
~	↓	↓	↓	↓	↓
<i>New Exchange Rate Classification</i>					
1999 I	FI	FI	PSC	FI	FI
~	↓	↓	↓	↓	↓
2000 IV					

Note: FM: Managed Float
 FI: Independent Float
 PUS: Pegged to U.S.dollar
 PCC: Pegged to Currency Composite

FM: Managed Floating with no preannounced path for exchange rate
FI: Independently Floating
PSC: Conventional Fixed Peg Arrangements against a single currency

Source: IFS (IMF)

central bank intervention. Their analysis included the cases of Indonesia, Korea and Thailand in the post-crisis period, and the Philippines in the recent decade, where their foreign exchange reserve volatilities are higher than those of the United States and Japan, and surprisingly, even those of the countries that are classified in "limited Flexibility" according to the IMF system.

We here verify the volatilities of foreign exchange reserves in the sample countries by examining the trends of their coefficients of variation from the pre-crisis period to the post-crisis period. We use the monthly data of the foreign exchange reserves in US Dollar base from January 1994 to December 2000, taken from the International Financial Statistics of the International Monetary Fund. Then we calculate the coefficients of variation year by year. If a country adopts the regime of "pure float", the coefficients of variation should, in principle, be zero.

Table 2 reports the results of the calculations. The main observations are as follows. First, Indonesia, Korea and Thailand, which announced "Independent Float" after the crisis, showed no significant changes in the coefficients of variation of their foreign exchange reserves regardless of their changes of the announced regime. Second, Malaysia, which shifted formally to "Pegged to US dollar", similarly showed no noteworthy change in its coefficients. Third, the Philippines, which kept to the formally "Independent Float" during the period, has mostly the same degree of coefficients as those of the other sample countries.

From the observation above, we speculate that the sample countries, except for Malaysia, are holding to the "soft peg" even in the post-crisis period regardless of their announcement of the "free float".

C. Exchange Rate Targeting

If we follow the hypothesis that the sample countries, except for Malaysia, are holding to the "soft peg", the next step is to examine what factors determine targeted reference rates; in other words, whether or not the sample countries are simply returning to the pre-crisis US dollar-pegged-rate

Table 2 Coefficient of Variation in Foreign Exchange Reserves

	Indonesia		Korea		Malaysia		Philippines		Thailand	
	C.V.	Regimes	C.V.	Regimes	C.V.	Regimes	C.V.	Regimes	C.V.	Regimes
1994	0.05		0.07		0.09		0.11		0.06	
1995	0.05	FM	0.09	FM	0.03	FM	0.08		0.08	PCC
1996	0.07		0.04		0.06		0.15		0.02	
1997	0.06	FM→FI	0.13	FM→FI	0.11		0.10	FI	0.15	PCC→FM
1998	0.12		0.24		0.09	FM→PUS	0.08		0.04	FM→FI
1999	0.04	FI	0.09	FI	0.06	PUS	0.08		0.06	FI
2000	0.07		0.07		0.05		0.04		0.01	

Notes:

- 1) C.V.: Coefficient of Variation in Foreign Exchange Reserves
- 2) The meanings of the symbols in Regimes are shown in Table 1.

Source: IFS (IMF)

regime as Mckinnon (2001) suggested. We here present the hypothesis that the sample countries, not simply relying on the US dollar standard, have come to pay more attention to inflation rates in their exchange rate management during the post-crisis period. We speculate that they may have learned the lessons that the Asian crisis was partly caused by the simple US dollar-pegged-rate regime accompanied by a rising real exchange rate and the moral hazard in inducing external borrowing. We first examine the actual movements of the real effective exchange rates to see whether the exchange rates have been adjusted by inflation rates. We next conduct a regression analysis to identify the factor of inflation adjustment in managing exchange rates.

C-1. Real Effective Exchange Rate

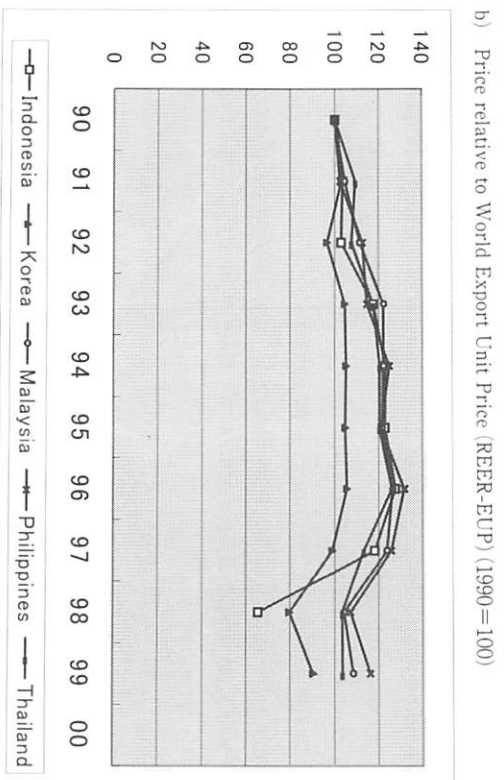
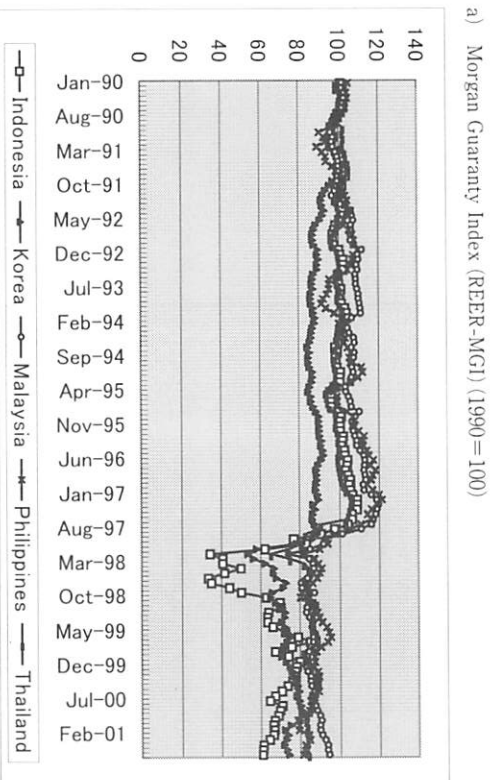
We first examine the actual movements of the real effective exchange rates (REER) in the sample countries. The REER is an indicator for a country's international price competitiveness. This indicator is obtained by unifying a bilateral real exchange rate that shows the prices of one country's output baskets relative to the others'. Therefore, when an exchange rate is fully adjusted according to a country's prices relative to the others' (the country follows the purchasing power parity), the country's REER levels off because the country's prices relative to the others' remains unchanged.

We here show two kinds of REER: One is the Morgan Guaranty indexes ($REER_{MGI}$), which are weighted averages of each real exchange rate of its trading partners wherein the weights are the share of the trading partner in the country's total exports and imports (JP Morgan (2001)). The other is the prices of one country relative to those of the competitors in the world export market ($REER_{EUP}$), which are obtained by dividing the US dollar value of the price level of a country in question by the US dollar value of the world export unit price index. The $REER_{MGI}$ clearly reflect the relative importance of a country's trading partners, while $REER_{EUP}$ value the role of competitors in third markets. It would be better, therefore, to evaluate the REER through both indices⁷¹.

The following are the main findings from Figure 1. First, during the pre-crisis period of 1990-96, the $REER_{EUP}$ show a clear trend of appreciation by more than 20% except that the trend for Korea shows only slight appreciation, while the $REER_{MGI}$ do not necessarily show the same trend of appreciation⁸⁾. Second, during the post-crisis period of 1998-2001, the $REER_{MGI}$ do not show any clear trends except that the one for Malaysia indicates the recent trend of appreciation. As for the $REER_{EUP}$, we cannot identify any trends because of lack of data after 2000.

We interpret the observation above in the following way. During the pre-crisis period, we cannot deny the possibility of the rising trend of the REER under the US dollar-pegged-rate regime from the movements of the $REER_{EUP}$. The $REER_{MGI}$ may not fully reflect the role of competitors in export markets, with the drastic devaluation of the Chinese Yuan in 1994 being the typical example. In the post-crisis period, we cannot present a clear-cut implication only from the movements of the $REER_{MGI}$. At least, we do not observe any evidence of appreciation except for Malaysia. We speculate that Malaysia, who shifted from Managed Float to Pegged to US dollar in 1998, may have recently had appreciation of the REER.

Figure Movements of Real Effective Exchange Rates



Notes:

- 1) All the indexes on exchange rates are expressed as the foreign currency price of a unit of domestic currency. Thus, an increase in the index means appreciation of the currency.
- 2) REER-EUP is calculated in case of Indonesia as follows:
Exchange Rate (U.S. dollar/Rupiah) * Indonesian WPI (Rupiah base)/World Export Price Index (U.S. dollar base)

Source: JP Morgan (2001), IFS (IMF)

C-2 Regression Analysis

We next turn to a regression analysis to identify the factors determining the targeted reference rates including inflation rate in managing exchange rates. We follow the work of Frankel and Wei (1994)⁹⁹ and specify the regression model in the following way.

$$\begin{aligned} \Delta \log(\text{Local Currency} / \text{SWF}) = & \alpha_1 \Delta \log(\text{USD} / \text{SWF}) + \alpha_2 \Delta \log(\text{JPY} / \text{SWF}) \\ & + \alpha_3 \Delta \log(\text{DEM} / \text{SWF}) + \alpha_4 \Delta \log((\text{CPI} + \text{CPI}_{-1}) / 2) + \epsilon \end{aligned}$$

Where SWF is the Swiss franc, USD is the US dollar, JPY is the Japanese yen, DEM is the German mark and ϵ is assumed to be a well-behaved error term, following $N(0, \sigma^2)$. CPI is the Consumer Price Index of the local country with a time lag to take the causality relationship between CPI and the value of local currency into account. The Swiss franc is chosen as an arbitrary *numeraire* for measuring variations in the exchange rate because it is an independently floating currency of an advanced country which nonetheless carries little weight in Asia's trade. Based on the first difference of logarithms (percentage changes), the simple regression model is multivariate ordinary least squares for each country and time period. All the sample data are monthly ones taken from the International Financial Statistics of the International Monetary Fund, for the sample countries - Indonesia, Korea, Malaysia, the Philippines and Thailand. The data are broken up into two periods - pre-crisis from January 1994 to December 1996, and post-crisis from January 1999 to December 2000. According to Frankel Wei (1994), if the local currency is tightly fixed to some particular value of the US dollar, then the regression coefficient α_1 should be discernible and approximately unity, while the others are close to 0. Another crucial variable is the local CPI. If the coefficient of the local CPI is significantly positive, we assume that the domestic inflation rate can be one of the factors determining the targeted reference rates in managing exchange rates.

Table 3 reports the results of the regressions. The main observations and their interpretations are as follows. First, the coefficients of the US dollar in all local currencies are significantly positive throughout the pre- and post- periods. In particular, the Philippine Peso of both periods and the pre-crisis Indonesian Rupiah have an approximate unity as a coefficient of the US dollar and the post-crisis Malaysian Ringgit has a rigid unity. The sample countries, except for Malaysia, therefore, seem to be holding the "soft peg" to the US dollar, during not only the pre-crisis period but also the post-crisis period, regardless of its assigned weights. Malaysia, who has announced "Pegged to US dollar" since 1998 is econometrically verified to fix its currency to the US dollar in the post-crisis period. Second, the coefficients of the local CPI are significantly positive in the post-crisis of the Thai Baht, the Philippine Peso and the Korean Won. Korea, the Philippines and Thailand, therefore, may have come to take the domestic inflation rates into account as one of the factors determining the targeted reference rates during the post- crisis period. Third, most of the coefficients of the Japanese yen and the German mark are insignificant and do not have a noteworthy characteristic in the process from the pre-crisis to the post crisis. Thus, there seem to be no significant changes in the weights assigned to the Japanese yen and German mark. Lastly, the post-crisis Indonesia Rupiah shows a relatively worse performance in the adjusted R-squared. Post-crisis Indonesia may have had its currency influenced by other factors such as political instability.

Table 3 Results of Regressions on Functions Determining Changes in Value of Currencies

	Period	USD	JPY	DEM	(CPI+CPI(-1))/2	R**2	D.W.
Baht	pre-crisis	0.85 ***	0.10 ***	0.04	0.01	0.998	1.275
	post-crisis	0.66 ***	0.23	-0.02	4.17 **	0.481	1.488
Peso	pre-crisis	1.05 ***	0.05	0.37	-0.22	0.843	0.805
	post-crisis	1.15 ***	-0.18	0.08 ***	2.78 ***	0.825	1.820
Won	pre-crisis	0.82 ***	0.20 ***	-0.14	0.18	0.908	1.472
	post-crisis	1.06 ***	0.44 ***	0.01	2.15 **	0.750	1.731
Rupiah	pre-crisis	0.97 ***	0.01	0.06	0.20 ***	0.986	1.459
	post-crisis	2.13 **	-0.85	-0.04	1.31	0.273	2.034
Ringgit	pre-crisis	0.78 ***	0.10	0.64 **	0.23	0.780	1.367
	post-crisis	1.00 ***	0.00	-0.00	0.00	1.000	2.829

Notes:

- 1) All currencies are in terms of units of Swiss francs.
- 2) The pre-crisis period is from January 1994 to December 1996, and the post-crisis period is from January 1999 to December 2000, except for the Baht (from June 1998 to December 2000) and the Won (from June 1998 to April 2001).
- 3) *, **, *** indicate that the coefficient is significant at the 90, 95, and 99 percent levels, respectively.

Source: IFS (IMF)

IV. Concluding Remarks

After the Asian crisis, Indonesia, Korea and Thailand officially announced the transition of their exchange rate regimes towards "free float" while Malaysia announced the transition towards the solid peg to the US dollar. It apparently looks as though the hypothesis of corner solution has taken hold in these post-crisis developments for the official regimes. When it comes to the de facto exchange rate regimes, however, Indonesia, Korea and Thailand as well as the Philippines, seem to be still holding to the "soft peg" regimes even in the post-crisis period. The post-crisis exchange rate targeting, however, appears to be somewhat different from the simple US dollar standard in the pre-crisis period. Our empirical evidence shows that Korea, the Philippines and Thailand have come to care about the factor of the inflation rate in addition to the US dollar linkage in their post-crisis exchange rate management.

The following issues still need analysis: First, the post-crisis period is a little too short to provide sufficient monthly data for analyses of the foreign exchange reserves, the REER, and the factors for exchange rate targeting. We will, therefore, need the re-analyses to get more consolidated outcomes by keeping track of the upcoming data. Second, it may be useful for our analysis to examine the exchange rate management of non-crisis countries and to compare them with the management of hardest-hit crisis countries. Third, we have to analyze more deeply the merits and demerits of inflation-adjusted management on exchange rates. Inflation adjustment under the "soft peg", with an exchange rate less volatile than "free float", may alleviate such risks as the rising real exchange rates (the loss of competitiveness) and the moral hazard inducing external borrowing. However, whether the "soft peg", even though inflation-adjusted, would still be the best regime consistent with growing international

financial integration (whether "soft peg" would help alleviate pressures associated with large capital flows), is the question.

[投稿受理日2001.10.31/掲載決定日2002.1.19]

NOTES

- (1) The descriptions in this section, mostly refer to ADB (2001) and Frankel et al. (2000).
- (2) As for the actual trends of the role of exchange rate in a macroeconomic framework and the factors underlying the shift of weight assigned to the role, see IMF (1999) and Taguchi (1998). Concerning the latest study on the choice of exchange rate regime including the theory of optimum currency area, see Poirson (2001).
- (3) Frankel et al. (2000) also reviews the literature on the hypothesis of corner solutions. As the latest study, Fischer (2001) discusses this hypothesis.
- (4) Fischer (1999) also suggests that greater exchange rate flexibility would be desirable in the future.
- (5) IMF classification system has grouped IMF members' exchange rate arrangements according to the degree of flexibility. The previous system, though it had been unchanged for over 14 years, has a number of shortcomings. In particular, there were sometimes important differences between the official classification, based on members' formally announced regimes, and the actual, de facto, exchange rate arrangements. IMF (1999) describes that the new system is based on the members' actual, de facto, regimes and it also presents members' exchange rate regimes against alternative monetary policy frameworks. The new system, however, does not necessarily seem to reflect de facto regimes such as informal exchange rate targeting because it still depends on the information provided by country authorities.
- (6) The exchange rate arrangements can be classified into three categories in general: the "hard peg" where a currency is fixed using a currency board or where the currency of another country has been adopted, the "soft peg" where the currency is tied to another currency or a basket of currencies either through a peg, a crawling peg, or bands around a reference rate, and "free float" where the value of the currency is either allowed to fluctuate freely or where there is a managed float. For details see ADB (2001).
- (7) The IMF weighting scheme is based on trade data for manufactured goods and primary goods, with weights reflecting both the relative importance of a country's trading partners in its direct bilateral trade relation, and that resulting from competition in a third market. However, the REER compiled by the IMF based on this weighting scheme is not available for the sample countries. The weights, which are derived from MERM (Multilateral Exchange Rate Model), each represent the model's estimate of the effect on the trade balance of the country in question of a 1 percent change in the domestic currency price of each of the other currencies. A detail description of the IMF weighting scheme is contained in the IFS of IMF "Supplement on Exchange Rates, No.9 (1985)".
- (8) Ohno (1999) argued that measured by real effective exchange rates (inflation-adjusted and trade-weighted exchange rates), no serious overvaluation is detected in the worst-hit economies during the pre-crisis period. However, this argument does not necessarily hold in case of counting the effects from competition in a third market.
- (9) Some of the local currencies are de facto linked to a basket of major currencies and the weights assigned to various currencies are not announced. Frankel and Wei (1994) argue that it is important to infer policies by observing actual behavior, rather than relying on official pronouncements, and estimate the implicit weights econometrically.

REFERENCES

- ADB (Asian Development Bank). 1998. *Asian Development Outlook 1998*. 23-37. Manila.
- . 2001. Asia's Globalization Challenge. *Asian Development Outlook 2001*. 161-201. Manila.
- Calvo, Guillermo A., and Carmen M. Reinhart. 2000. Fear of Floating. *NBER Working Paper* No. 7993. Cambridge, Massachusetts: National Bureau of Economic Research.

- Fischer, Stanley. 2001. Exchange Rate Regimes: Is the Bipolar View Correct? This paper was prepared for the 2001 American Economic Association meetings, Washington, D. C: International Monetary Fund.
- . 1999. On the Need for a Lender of Last Resort. Address to the American Economic Association. New York. January 3.
- Frankel, Jeffrey A., and S. J. Wei. 1994. "Yen Bloc or Dollar Bloc? Exchange Rate Policies in the East Asian Economies." In Takatoshi Ito and Anne Krueger, eds., *Macroeconomic Linkage: Savings, Exchange Rates, and Capital Flow*. NBER-East Asia Seminar on Economics 3. Chicago: University of Chicago Press.
- Frankel, Jeffrey A., Sergio Schmukler, and Luis Servén. 2000. Verifiability and the Vanishing Exchange Rate Regime. This paper was prepared for the Brookings Trade Forum 2000: Policy Challenges in the Next Millennium, April 27-28, 2000, Washington, D.C.
- IMF (International Monetary Fund). 1998. *World Economic Outlook: May 1998*. 3-7. Washington, D.C.
- . 1999. Exchange Rate Arrangements and Currency Convertibility: Developments and Issues. *World Economic and Financial Surveys*. 23-46. Washington, D.C.
- . 2001. *International Financial Statistics*. June 2001, and previous issues. Washington, D.C.
- JP Morgan. 2001. JP Morgan Real Broad Effective Exchange Rate Indices, July 2001. [<http://www.jp-morgan.com/MarketData/Ind/Forex/currIndex.html>]
- Mckinnon, Ronald. 2000. The East Asian Dollar Standard, Life after Death? *Economic Notes* 29 (1, February). 31-82.
- . 2001. After the Crisis, the East Asian Dollar Standard Resurrected: an Interpretation of High-frequency Exchange Rate Pegging. In Joseph E. Stiglitz and Shahid Yusuf, eds., *Rethinking the East Asian Miracle* (Chapter 5). 197-246. Washington, D.C: World Bank.
- Ohno, Kenichi. 1999. Exchange Rate Management in Developing Asia: Reassessment of the Precrisis Soft Dollar Zone. *ADB Working Paper* 1 (January). Tokyo: Asian Development Bank Institute.
- Poirson, Helene. 2001. How Do Countries Choose Their Exchange Rate Regime? *IMF Working Paper* WP/01/46. Washington, D.C: international Monetary Fund.
- Taguchi, Hiroyuki. 1998. Exchange Rate Movements and Trade Balances in Selected ASEAN Countries. *Scio-Science* 4: 187-207. Tokyo: Waseda University.
- World Bank. 1998. *East Asia: The Road to Recovery*. 1-18. Washington, D.C.
- . 2000. *East Asia: Recovery and Beyond*. 19-43. Washington, D.C.