This study estimates the break point in the residual variance and in the propagation mechanism of the real exchange rates at about the time of the Asian crisis that occurred in 1997, and provides some explanations for the breaks. The breaks in the residual variance increased the volatility of the real exchange rates, which given the overall effects of common adverse shocks to the countries seems to be reinforced by the sudden withdrawal of Japanese commercial banks’ lending to the region. And the subsequent breaks in the propagation mechanism reduced the volatility, which reflects the change in the government policy stance to result in smoothing the pace of appreciation. In addition, the breaks in the nominal exchange rates rather than in the price ratios are mainly responsible for the breaks in the real exchange rates.

Keywords: Asian Crisis, Structural Break, Real Exchange Rate, Residual Variance, Propagation Mechanism, Japanese Commercial Banks, Reserve Accumulation

JEL Classification: F3

* Hoe Sang Chung is the first and the corresponding author of the paper.
본 연구에서는 1997년 동아시아 외환위기를 경험한 국가들의 실질환율에 구조 변화 (structural break)가 있었는지를 추정하여 그 의미를 분석하였다. 환율의 움직임을 모 형화한 AR 모형의 잔차항 분산(residual variance)에 발생한 구조 변화는 환율의 변동성을 높이는 방향으로 작용하였는데, 이는 이 국가들에 대한 일본 상업은행들의 대부금 회수에 의해 강화된 것으로 보인다. 한편 잔차항 분산의 구조 변화에 이어 발생한 AR 모형의 전파구조(propagation mechanism)의 구조 변화는 환율의 변동성을 줄이는 방향으로 작용하였다. 이는 환율의 변동성을 줄이고자 한 각국 정부의 정책 변화를 반영 한다. 또한 실질환율의 구조 변화는 주로 물가비율의 구조 변화보다는 명목환율의 구조 변화에 기인한 것이다.

핵심용어: 동아시아 외환위기, 구조 변화, 실질환율, 잔차항 분산, 전파구조, 일본 상업은행
I. Introduction

The purpose of this study is to estimate the point of time of a structural break in the residual variance and in the propagation mechanism of real exchange rates of the five Asian countries—Indonesia, Korea, Malaysia, the Philippines, and Thailand—at about the time of the financial crisis that occurred in 1997. It also provides some plausible explanations for the breaks, which are well supported by empirical findings in the literature. In addition, it investigates whether the nominal exchange rates or the price ratios are the source of breaks.

While it is well known that the Asian crisis should bring about a structural change in the real exchange rate movements, no econometric evidence on the break has been reported in the literature. Provision of empirical results on the break and its source should enable us to better understand the anatomy of the Asian financial crisis.1)

Applying the method developed by Andrews (1993), we find that there occurred a structural break in the residual variance as well as in the propagation mechanism of the real exchange rates. Although there are some studies on structural break in the real exchange rates based on the method developed by Perron (1990) and Perron and Vogelsang (1992), these studies concern primarily about the test for the purchasing power parity, which differ from this study in that the sources of the break are not identified. An example is the work by Aggarwal, Montañés, and Ponz (2000).

The break in the residual variance occurred in a serial order in Thailand, Indonesia, Korea, and Malaysia. These breaks increased the volatility of the real

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1) There is a considerable amount of literature on the causes of financial crisis including the Asian crisis. Among others, Radelet and Sachs (1998) explained that sudden reversal in market expectations and confidence was the key sources of the financial turmoil. Corsetti et al. (1999) claimed that the crisis reflected structural and policy distortions in the countries of the region. It is beyond the scope of this study to further investigate the sources of the Asian crisis.
exchange rates except for Malaysia that blocked adverse shocks by switching the exchange rate regime to pegged arrangement with stringent capital control. Given the fact of the crisis occurred first in Thailand, the sequential break in the real exchange rates of the region would reflect some contagion effect. As Kaminsky and Reinhart (2000) indicated, the financial links rather than the trade links among the economies are primarily responsible for the contagion. Specifically, the sudden withdrawal of credit lending to the region by Japanese commercial banks seems to bear significant responsibility for the sequential break in the residual variance. However, no break was detected in the Philippines that had maintained fairly flexible exchange rate system with the least dependence on Japanese commercial banks’ lending among the five countries.

On the other hand, the subsequent structural break in the propagation mechanism (AR component) of the real exchange rates took place in Korea, Indonesia, and Malaysia. Interestingly, these breaks occurred to reduce the volatility of the real exchange rates, implying that there was a change in the government policy stance in an attempt to reduce the exchange rate fluctuations. In particular, as Hernández and Montiel (2003) interpreted, the crisis countries conducted exchange rate policies to result in smoothing the pace of appreciation in the post-crisis period, which is accompanied by the accumulation of foreign exchange reserves. However, no break was found in the Philippines and Thailand, which indicates milder accumulation of reserves than the three other countries.

In addition, the breakdown of the real exchange rate into the nominal exchange rate and the price ratio demonstrates that the break in the former is the source of the break in the real exchange rate.

The rest of the paper is organized as follows. Section 2 describes the real exchange rate behavior and conducts a preliminary test for its structural stability. Section 3 estimates the point of time of a structural break and addresses its effect on the real exchange rate movements thereafter, and a concluding summary is offered in the final section.
II. Preliminary Test for Structural Stability of the Real Exchange Rates

1. Increase in the Real Exchange Rate Volatility

Figure 1 depicts the first differenced series of log real exchange rate of each country.\(^2\) It shows that the volatility of the real exchange rates, except for Malaysia, increased after some date between 1997:05 and 1998:10, which is marked by the shaded areas. Also, sample standard deviation reported in Table 1 shows an increase in volatility of the series. For example, standard deviation of the Korean won/US dollar exchange rate increased from 0.0083 for the period 1990:01–1997:04 to 0.0209 for the period 1998:11–2003:12. Of course, this reflects the aftermath of the Asian currency crisis. Thus, we conjecture that a structural break in each real exchange rate occurred between 1997:05 and 1998:10.

Table 1. Standard Deviations of Log Differences of Real Exchange Rates

<table>
<thead>
<tr>
<th>Exchange Rate</th>
<th>Sample Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indonesia</td>
<td>0.0789</td>
</tr>
<tr>
<td>Korea</td>
<td>0.0347</td>
</tr>
<tr>
<td>Malaysia</td>
<td>0.0251</td>
</tr>
<tr>
<td>Philippines</td>
<td>0.0246</td>
</tr>
<tr>
<td>Thailand</td>
<td>0.0312</td>
</tr>
</tbody>
</table>

\(^2\) The real exchange rate refers to the domestic currency price of US dollar deflated by the relative consumer price index. And the monthly observations over the period 1990:01–2003:12 are taken from the IMF *International Financial Statistics* CD-ROM. The sample period was chosen based on the data availability and the number of observations in the post-crisis period.
Figure 1. First Differences of Log Real Exchange Rates: 1990:01–2003:12
2. Structural Stability

To complement the above facts, we test for structural stability of the real exchange rates with a CUSUM and CUSUM of squares test (Brown et al., 1975). The CUSUM test is based on the cumulative sum of the one-step-ahead forecast error obtained from a recursive estimation. Instability in the parameter of the intercept is indicated if the cumulative sum goes outside the two critical lines. The CUSUM of squares test is based on the cumulative sum of the squared one-step-ahead forecast error obtained from the estimation. Instability of variance is also detected if the cumulative sum goes outside the critical lines. Figure 2 shows the test results. The CUSUM test results depicted on the left hand side do not reveal instability in the intercept for each exchange rate whereas the CUSUM of squares test results shown on the right hand side detect instability in the variance of regression error, though not strong for the Philippines.3) However, both tests are not designed to determine the point of

3) Theoretical investigation reveals that the CUSUM test is essentially a test for detecting instability in the intercept alone and the CUSUM of squares test is the one for detecting instability in the variance of regression error (see, for example, Krämer, Ploberger, and Alt, 1988; Ploberger and Krämer, 1990; and Hansen, 1992).
Figure 2. (Continued) Structural Stability: 1990:01-2003:12

Korea

Malaysia

Philippines
time of a structural break if it has occurred. And the tests are often criticized for their alleged poor asymptotic power. Therefore, other methods should be used to solve these drawbacks, which will be addressed in the next section.

III. Test for the Structural Break with Unknown Change Point and Its Implications

1. Methodology

In this section, we estimate the point of time of a structural change in the real exchange rates. Since the seminal work of Andrews (1993), tests for a structural change with unknown break date in a time series have become prevalent. For example, McConnell and Perez-Quiros (2000) and Stock and

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5) The classical test for a structural change is attributed to Chow (1960). The test procedure splits the whole sample into two sub-samples, and tests for the equality of the two sets of the parameters using a classical $F$ statistic. However, one limitation of the Chow test
Watson (2002) found overwhelming evidence of a substantial decrease in volatility of U.S. GDP growth rate around 1984. Below we briefly present the method of Andrews to estimate a structural change date in a stationary time series and report the empirical results in the next subsection.

With an AR(1) model of a stationary series, we test for a structural break in the real exchange rate from equation (1).

\[
\Delta r_t = \mu + \phi \Delta r_{t-1} + \epsilon_t , \tag{1}
\]

where \( \epsilon_t \sim N(0, \sigma^2_t) \). Since \( \{\Delta r_t\} \) is a stationary process, the volatility (unconditional variance) of the series can be represented as equation (2).

\[
\text{var}(\Delta r_t) = \frac{\sigma_t^2}{1 - \phi^2} . \tag{2}
\]

In equation (2), we attribute a structural break in the volatility to either the residual variance, \( \sigma_t^2 \), or the coefficient of AR(1) model, \( \phi \), or both. Therefore, we first look for a break in the residual variance in equation (3).

\[
|\hat{\epsilon}_t| = \alpha + \epsilon_t , \tag{3}
\]

where \( \alpha \) is the estimator of the standard deviation. We estimate a break point by jointly estimating equations (1) and (4).

\[
|\hat{\epsilon}_t| = \alpha_1 D_1 + \alpha_2 D_2 + \epsilon_t , \tag{4}
\]

is that the break date must be known a priori. Quandt (1960) proposed an alternative test procedure, which takes the largest Chow statistic over all possible break dates. However, if the break date is unknown a priori, then the chi-square critical values are inappropriate. What critical values should be used instead? For many years, this question remained unanswered, and the Quandt statistic had no practical application. The problem was solved by Andrews (1993).
where

\[ D_{1t} = \begin{cases} 0 & \text{if } t \leq T_b \\ 1 & \text{if } t > T_b \end{cases}, \]

\[ D_{2t} = \begin{cases} 1 & \text{if } t \leq T_b \\ 0 & \text{if } t > T_b \end{cases}, \]

and \( T_b \) is the estimated break point, and \( \alpha_1 \) and \( \alpha_2 \) are the corresponding estimators of the standard deviation.

The appearance of the parameter \( T_b \) under the alternative hypothesis, not under the null, implies that LM, LR, and Wald tests for the equality of the coefficients \( \alpha_1 \) and \( \alpha_2 \) do not have standard asymptotic properties. Andrews (1993) developed the tests for the cases such as this, where a nuisance parameter is present under the alternative but not under the null. He considered the function, \( W_T(\tau) \), where \( T \) is the sample size, defined as Wald or LM statistic for the hypothesis that \( \alpha_1 = \alpha_2 \) for each possible value of \( \tau \). We assume that \( \tau \) lies in between \( \tau_1 \) and \( \tau_2 \), where \( \tau_1 = 0.15 \times T \) and \( \tau_2 = 0.85 \times T \). He showed that for a fixed value of \( \tau \) and given any set of \( \Pi \) whose closure lies in \( (0, 1) \):

\[
\sup_{\tau_1 \leq \tau \leq \tau_2} W_T(\tau) \xrightarrow{d} \sup_{\pi \in \Pi} Q(\pi), \tag{5}
\]

where \( Q_p(\pi) = \frac{(B_p(\pi) - \pi B_p(1))}{\pi(1-\pi)} \), and \( B_p(\cdot) \) is a \( p \)-vector of independent Brownian motions on \([0, 1]\) restricted to \( \Pi \). In the test, the \( \tau \) that maximizes \( W_T(\tau) \) will be the estimated date of the break. The asymptotic critical values for the test are available in his paper.

Now we consider the possibility that the observed break in the volatility is actually the result of a break in the coefficient of AR(1) model. To test the null hypothesis of there being no break in the coefficient of AR(1) model, we
estimate equation (6).

\[ \Delta r_t = \mu + \phi_1 \Delta r_{t-1} D_{t1} + \phi_2 \Delta r_{t-1} D_{t2} + \epsilon_t, \quad (6) \]

where \( D_{t1} \) and \( D_{t2} \) are defined above. The null hypothesis of \( \phi_1 = \phi_2 \) implies that there is no structural break in the AR(1) coefficient.

2. Empirical Results

1) Break in the Residual Variance

The test results with incorporation of heteroskedasticity and autocorrelation consistent covariance matrix due to Newey-West (1987) are reported in Table 2. Panel A of Table 2 tabulates the results of the test for a structural change in the residual variance of the real exchange rates. The time of the break is estimated to be May 1997 for Thailand, July 1997 for Indonesia, December 1997 for Korea, and February 1999 for Malaysia, respectively. The maximized values of Wald statistic in the break date are, respectively, 8.98, 12.28, 10.53, and 7.88. With the critical value of 12.35 (8.85, 7.17) at 1 (5, 10) percent level, the Wald statistics show a rejection of the null hypothesis of there being no break in the residual variance \( (\sigma^2 = \sigma_2^2) \) for the four countries, and no break was found in the Philippines. The estimated standard deviations of the real exchange rates in the pre- and post-break periods are, respectively, 0.0057 and 0.0234 for Thailand, 0.0052 and 0.0672 for Indonesia, 0.0068 and 0.0242 for Korea, and 0.0143 and 0.0031 for Malaysia.6) This implies that the structural breaks in the residual variance, except for Malaysia, occurred to increase the volatility of the real exchange rates.

The occurrence of the breaks in a serial order with the exception of the Philippines implies that there was a contagion effect among the four countries. Specifically, as indicated by Kaminsky and Reinhart (2000), the sudden

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6) The pre- and post-break periods are 1990:01 to \( T_B^{-1} \) and \( T_B \) to 2003:12, respectively.
withdrawal of Japanese commercial banks’ credits to the region seems to be mainly responsible for the contagion. On the eve of the Asian crisis, all countries but the Philippines were heavily dependent upon Japanese commercial banks’ lending. As of December 1996, 39.7, 24.3, 36.9, 11.7, and 53.5 percent of total liabilities were to Japanese banks for Indonesia, Korea, Malaysia, the Philippines, and Thailand, respectively.

Table 2. Test Results of Structural Break: 1990:01 to 2003:12

<table>
<thead>
<tr>
<th>Exchange Rate</th>
<th>Null</th>
<th>Sup</th>
<th>Estimated Break Date</th>
<th>Pre-break Period</th>
<th>Post-break Period</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Structural Break in Residual Variance</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indonesia</td>
<td>$\sigma_1^2 = \sigma_2^2$</td>
<td>12.28**</td>
<td>1997:07</td>
<td>0.0052***</td>
<td>0.0672***</td>
</tr>
<tr>
<td>Korea</td>
<td>$\sigma_1^2 = \sigma_2^2$</td>
<td>10.53**</td>
<td>1997:12</td>
<td>0.0068***</td>
<td>0.0242***</td>
</tr>
<tr>
<td>Malaysia</td>
<td>$\sigma_1^2 = \sigma_2^2$</td>
<td>7.88*</td>
<td>1999:02</td>
<td>0.0143***</td>
<td>0.0031***</td>
</tr>
<tr>
<td>Philippines</td>
<td>$\sigma_1^2 = \sigma_2^2$</td>
<td>3.47</td>
<td>none</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Thailand</td>
<td>$\sigma_1^2 = \sigma_2^2$</td>
<td>8.98**</td>
<td>1997:05</td>
<td>0.0057***</td>
<td>0.0234***</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Exchange Rate</th>
<th>Null</th>
<th>Sup</th>
<th>Estimated Break Date</th>
<th>Pre-break Period</th>
<th>Post-break Period</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>B. Structural Break in AR(1) Coefficient</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indonesia</td>
<td>$\phi_1 = \phi_2$</td>
<td>10.34**</td>
<td>1998:02</td>
<td>1.30***</td>
<td>–0.02</td>
</tr>
<tr>
<td>Korea</td>
<td>$\phi_1 = \phi_2$</td>
<td>8.00*</td>
<td>1998:01</td>
<td>2.27***</td>
<td>0.28***</td>
</tr>
<tr>
<td>Malaysia</td>
<td>$\phi_1 = \phi_2$</td>
<td>15.00***</td>
<td>1998:02</td>
<td>0.89***</td>
<td>–0.27</td>
</tr>
<tr>
<td>Philippines</td>
<td>$\phi_1 = \phi_2$</td>
<td>4.08</td>
<td>none</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Thailand</td>
<td>$\phi_1 = \phi_2$</td>
<td>2.96</td>
<td>none</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

Notes: Panel A presents the results of structural break test of the type discussed in Andrews (1993) for the null hypothesis of there being no break in the variance parameter. “Sup” refers to the supremum test statistic described in equation (5). *, **, and *** denote significance at 10%, 5%, and 1% level, respectively. Panel B presents the results from the same test for the null hypothesis of there being no break in the AR component of the model. Coefficients are estimated using the OLS method with Newey-West standard errors.
Malaysia switched to a pegged arrangement in September 1998 with stringent
capital control as shown in Table 3. These regime and policy changes resulted
in the break in the residual variance that occurred in February 1999 to decrease
the volatility. This supports Edison and Reinhart (2001) who claimed that
capital control in Malaysia was effective in raising the interest rate and
stabilizing the exchange rate. The reason of there being no break in the
Philippines would be that they had fairly flexible exchange rates before the
Asian crisis with the least dependence upon Japanese commercial banks’ credits
among the five countries.7)

2) Break in the Propagation Mechanism

The test results on the null of there being no break in the coefficient of
AR(1) model are reported in the panel B of Table 2. The calculated Wald
statistics reject the null ($\phi_1 = \phi_2$) at the standard level of significance for
Indonesia, Korea, and Malaysia, and the time of the break was found to be
January 1998 for Korea and February 1998 for the two other countries. The
estimated values of the AR component in the pre- and post-break periods are,
respectively, 2.27 and 0.28 for Korea, 1.30 and $-0.02$ for Indonesia, and 0.89
and $-0.27$ for Malaysia.8) Therefore, these breaks occurred to decrease the
volatility of the real exchange rates. However, no break was found in the
Philippines and Thailand.

The breaks in the propagation mechanism are associated with a change in the
government policy stance to reduce the exchange rate fluctuations. As shown in
Table 3, Indonesia, Korea, and Thailand responded to the crisis by switching
from managed floating to de jure independent floating. Note that the exchange
rate regime shift from managed to independent floating preceded the occurrence
of breaks in the AR component for Indonesia and Korea. This implies that

7) The Philippines were the most heavily dependent upon the U.S. banks’ lending among
the countries under examination, owing 29.4 percent of their total liabilities as of
December 1996.

8) The estimates $-0.02$ for Indonesia and $-0.27$ for Malaysia are statistically insignificant.
there was a change in the government policy stance in order to decrease the exchange rate fluctuations with the shift to flexible exchange rate regime. Malaysia maintained the managed floating system at the time of the Asian crisis and then moved to the pegged arrangement after the crisis. The regime shift in Malaysia implies a stronger arrangement not to allow the exchange rate to fluctuate, producing a break in the propagation mechanism.

Investigating the de facto exchange rate regime of these countries in the post-crisis period, Hernández and Montiel (2003) explained that the government of the crisis countries intervened in the foreign exchange market to smooth the pace of exchange rate appreciation with accumulation of international reserves, which reflects the so-called “fear of floating” examined, among others, by Calvo and Reinhart (2002) and McKinnon and Schnabl (2003). Hernández and Montiel (2003) also interpreted that, if retarding the pace of appreciation was not the ultimate objective of the intervention, the post-crisis moderation of the exchange rate appreciation is simply the byproduct of the accumulation of a “war chest” of international reserves. In either case, the ultimate result was the slowdown of the exchange rate appreciation, which produced a break in the AR(1) component.

Based on these findings, we interpret the reason of there being no break in Thailand and the Philippines is the relatively milder accumulation of foreign reserves than the three other countries. Hernández and Montiel (2003, p. 349, footnote 19) state: “The implicit monthly growth rate—between the minimum and maximum level—of reserves during the post-crisis period are 2.4 percent for Indonesia, 3.3 percent for Korea, 2.7 percent for Malaysia, 1.5 percent for the Philippines, and 1.2 percent for Thailand.” In short, although the crisis countries with an exception of Malaysia declared “independently floating” after the crisis, they actually intervened more or less in the foreign exchange market, at least compared to the “clean floaters.”

9) The fact that the Philippines had maintained independent floating during the entire period under investigation would be the cause of mild accumulation of reserves in the Philippines.
Table 3. Official Exchange Rate Arrangements in the Five Asian Countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Date</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indonesia</td>
<td>November 1978 – June 1997</td>
<td>Managed floating</td>
</tr>
<tr>
<td></td>
<td>July 1997 – December 2001</td>
<td>Independently floating</td>
</tr>
<tr>
<td>Korea</td>
<td>March 1980 – October 1997</td>
<td>Managed floating</td>
</tr>
<tr>
<td></td>
<td>November 1997 – December 2001</td>
<td>Independently floating</td>
</tr>
<tr>
<td>Malaysia</td>
<td>January 1986 – February 1990</td>
<td>Limited flexibility</td>
</tr>
<tr>
<td></td>
<td>March 1990 – November 1992</td>
<td>Fixed</td>
</tr>
<tr>
<td></td>
<td>December 1992 – September 1998</td>
<td>Managed floating</td>
</tr>
<tr>
<td></td>
<td>September 1998 – December 2001</td>
<td>Pegged arrangement</td>
</tr>
<tr>
<td>Philippines</td>
<td>January 1988 – December 2001</td>
<td>Independently floating</td>
</tr>
<tr>
<td></td>
<td>July 1997 – December 2001</td>
<td>Independently floating</td>
</tr>
</tbody>
</table>


3) Breakdown of the Real Exchange Rate

To identify the source of the structural break from a different angle, we break down the real exchange rate into the nominal exchange rate and the price ratio, and test for a break in each series. The results are reported in Table 4. The existence of the break and its date in the nominal exchange rate are the same as in the real exchange rate. Also, as in the real exchange rate, the break in the residual variance occurred to increase the nominal exchange rate volatility whereas the one in the AR component took place to decrease its variability, though not shown in Table 4. One exception is Malaysia in which the break in the residual variance of the nominal exchange rate occurred prior to the break in the real exchange rate, and the break reduced the volatility of the nominal exchange rate.

For the price ratio, no break was detected in the residual variance at about the time of the Asian crisis for all countries. However, there occurred a break in the AR component in January 1998 in Indonesia and March 1998 in Korea. This might contribute in part to the break in the real exchange rate for the two countries. In sum, the breaks in the nominal exchange rates are mainly
responsible for the breaks in the real exchange rates.

<table>
<thead>
<tr>
<th></th>
<th>Nominal Exchange Rate</th>
<th>Price Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Residual Variance</td>
<td>AR Component</td>
</tr>
<tr>
<td>Malaysia</td>
<td>1998:12</td>
<td>1998:02</td>
</tr>
<tr>
<td>Philippines</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td>Thailand</td>
<td>1997:05</td>
<td>none</td>
</tr>
</tbody>
</table>

Note: Break dates are reported only when the test indicates significance at least at the 10 percent level.

**IV. Concluding Summary**

This study estimates the point of time of a structural break in the residual variance and the propagation mechanism of the real exchange rates at about the time of the currency crisis for the five Asian countries—Indonesia, Korea, Malaysia, the Philippines, and Thailand, and investigates the effect of the break on the real exchange rate movements thereafter. It also identifies the source of the break in terms of the nominal exchange rate and the price ratio.

First, the break in the residual variance occurred in a serial order in Thailand, Indonesia, Korea, and Malaysia to make the real exchange rates more volatile with the exception of Malaysia where it decreased the volatility because of the exchange rate regime shift to a pegged one with stringent capital control. Given the fact that the crisis occurred first in Thailand, the sequential break is suggestive of some contagion effect for which the sudden withdrawal of Japanese commercial banks’ lending to the region seems to be primarily responsible. However, no break was detected in the Philippines that had maintained flexible exchange rate regime with their least dependence upon Japanese commercial banks’ lending.
This suggests that freely floating exchange rate system together with diversified borrowing is a policy combination that reduces the chance of financial crisis.

Second, the so-called “hollow middle” hypothesis does not apply to the post-crisis period for the region in general. The break in the propagation mechanism (AR component) occurred to reduce the volatility in Indonesia and Korea, which would reflect the de facto change in the policy stance of the government to result in smoothing the pace of exchange rate appreciation via international reserve accumulation in the post-crisis period. The nonexistent break in the Philippines and Thailand does not mean that these countries did not attempt to accumulate reserves, but means that the reserve accumulation was not strong enough to produce a break. For Malaysia, switching to a pegged arrangement with stringent capital control produced a break in AR component.

Finally, the breaks in the nominal exchange rates, not in the price ratios, bear significant responsibility for the breaks in the real exchange rates.

References


Hoe Sang Chung

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