IMES DISCUSSION PAPER SERIES

EXCHANGE RATE ARRANGEMENTS IN EAST ASIA:
LESSONS FROM THE 1997-98 CURRENCY CRISIS

Masahiro KAWAI

Discussion Paper No. 2002-E-17

IMES

INSTITUTE FOR MONETARY AND ECONOMIC STUDIES

BANK OF JAPAN

C.P.O BOX 203 TOKYO
100-8630 JAPAN

IMES Discussion Paper Series 2002-E-17

September 2002

EXCHANGE RATE ARRANGEMENTS IN EAST ASIA: LESSONS FROM THE 1997-98 CURRENCY CRISIS

Masahiro KAWAI *

Abstract

This paper examines the evolution of exchange rate arrangements in East Asia's emerging market economies over the last ten years. It considers both "official" and "observed" exchange rate arrangements in these economies in international comparative perspectives. By focusing on the roles of the US dollar, the Japanese yen, and the euro as anchor currencies for exchange rate stabilization, the paper claims that the US dollar played a dominant role as a *de jure* or *de facto* anchor for emerging East Asia until the 1997-98 currency crisis. During the crisis, the dollar's dominance naturally declined in affected East Asia as a result of a general shift to more flexible exchange rate arrangements. In the post-crisis period the dollar has regained prominence in some countries (notably in Malaysia), while its dominance has been reduced and exchange rate flexibility has risen in others (notably in Indonesia). Interesting is the observation that Korea and Thailand appear to have shifted to a *de facto* currency basket arrangement with significant weights on the US dollar and the yen, similar to Singapore's managed floating arrangement. This paper also considers what may be a desirable currency system for the region. Given the high volatility of yen/dollar exchange rates and partner diversity of trade and FDI relationships, it claims that emerging East Asia would be better off stabilizing their currencies to a balanced currency basket in which the dollar, the yen and the euro play equally important roles. The degree of exchange rate stabilization and actual weights assigned to the major currencies in the basket can vary across countries at least in the initial stage. For intra-regional exchange rate stability, greater coordination on the currency basket policy would be desirable, and this needs to be supported by regional surveillance and financing mechanisms.

Key words: East Asian currency crisis, exchange rate arrangements, two-corner solution approach, fear of floating, currency basket system.

JEL classification: F31, F33

* Deputy Vice Minister for International Affairs, Ministry of Finance, Japan
(E-mail: masahiro.kawai@mof.go.jp)

This is a revised version of the paper presented to the Tenth International BOJ Conference "Exchange Rate Regimes in the 21st Century," organized by the Institute for Monetary and Economic Studies, Bank of Japan, and held in Tokyo on July 1-2, 2002. The author is thankful to Hwee Kwan Chow, Eiji Hirano and many other participants at the conference for helpful comments, to Ronald McKinnon for constructive communication, to Shigeru Akiyama for earlier research collaboration, and to Junko Shimizu for research assistance. The findings, interpretations, and conclusions expressed in the paper are those of the author and do not necessarily represent the views of the Japanese Government. Toshiyuki Matsuura and Kiyotaka Satoyoshi provided able research assistance. All remaining errors are clearly my own.

I. INTRODUCTION

Reflecting on the East Asian currency crisis in 1997-98, this paper examines how the East Asian exchange rate arrangements have evolved over the last decade. For this purpose it examines exchange rate arrangements of other developing countries and evaluate the East Asian practice in international comparative perspectives. It also explores what may be a resilient regional exchange rate arrangement for East Asia's financial stability, economic development driven by trade and foreign direct investment (FDI), and sustained growth.

The East Asian currency crisis forced many economies in the region to shift away from *de facto* US dollar-pegged regimes to more flexible exchange rate regimes. The US dollar had played a dominant role as an international anchor currency until the outbreak of the crisis in the summer of 1997. During the crisis, the anchor currency role of the US dollar was substantially reduced, due to a general shift to more flexible rate arrangements. As the currency crisis subsided in the second half of 1998, however, the East Asian economies have generally restored exchange rate stability—with the exception of Indonesia. This restoration of rate stability has been accompanied by a greater role of the US dollar in some countries — notably in Malaysia—and a greater role of the Japanese yen in others—notably in Singapore, Korea and Thailand.

Emerging market economies, including those in East Asia,[1] face a trade-off between the virtue of exchange rate stability to promote trade, investment and growth and the need for flexibility, particularly during a time of crisis, to maintain international price competitiveness and facilitate adjustment. The "two-corner solution" approach of choosing either a pure float—often accompanied by inflation targeting—or a hard peg—an institutionally binding fixed rate regime like monetary union, unilateral dollarization or yenization, or a currency board—does not appear to be realistic in many emerging East Asian economies. The reason is that they appear to have a "fear of floating" or a preference towards exchange rate stability, though not necessarily rigidity. Given emerging East Asia's diversified trade and FDI relationships with the United States, Japan, and the European Union and given the continued high exchange-rate volatility among the tri-polar currencies, a reasonable exchange rate policy for the region would be to stabilize rates to a basket of currencies consisting of the US dollar, the yen, and the euro.

The organization of the paper is as follows: Section II examines the nature of "official" and "observed" exchange rate arrangements for developing economies in the world. This section finds that many authorities in the developing world exhibit a "fear of floating" or a preference for stable exchange rates vis-à-vis an international currency or a basket of such currencies. Section III analyzes the changing importance of the US dollar, the Japanese yen and the euro as international anchor currencies for the exchange rate behavior of the

[1] In this paper, emerging East Asian economies include: China, Hong Kong, Indonesia, Korea, Malaysia, the Philippines, Singapore, Taiwan, and Thailand.

emerging East Asian economies before, during, and after the currency crisis. It finds that the US dollar played a dominant role as an anchor currency for exchange rate stabilization in emerging East Asia in the pre-crisis period, but that its dominant role naturally declined during the crisis. It also finds that, in the post-crisis period, some economies have reverted to a pre-crisis type of US dollar-based exchange rate regime, while others have allowed greater exchange rate flexibility. Several countries have shifted to a *de facto* currency basket arrangement with large weights on the US dollar and the yen. Section IV proposes a region-wide currency basket system where the US dollar, the yen and the euro would play more balanced roles. How tightly or loosely the exchange rate should be stabilized is left to each economy's specific conditions and preferences as least initially. It also argues that a currency basket system needs to be accompanied by closer regional coordination through financing and surveillance mechanisms, in a way commensurate with real sector integration. Section V summarizes the paper.

II. TRENDS IN EXCHANGE RATE ARRANGEMENTS IN THE DEVELOPING WORLD

1. "Official" Exchange Rate Arrangements

The International Monetary Fund (IMF) regularly publishes exchange rate arrangements formally reported by its member countries according to its own classification scheme. In 1999, the IMF started to classify member exchange rate arrangements based on *de facto* practices rather than formally reported arrangements. Table 1 summarizes such "official" arrangements for developing countries during 1980-2001.[2] In this table, exchange rate arrangements are classified broadly into three categories; a fixed rate arrangement, limited exchange rate flexibility, and a more flexible rate arrangement.[3]

While the number of IMF members in the developing world has increased over time (from 118 in 1980 to 163 in 2001), the number of countries under fixed exchange rate arrangements has decreased (from 90 to 76), and the number of countries under more flexible exchange rate arrangements has increased (from 25 to 83). As far as "official" exchange rate arrangements are concerned, many countries have shifted from fixed to more flexible arrangements over the last twenty years. Nonetheless, quite a few countries still attempt to

[2] See International Monetary Fund (1997), and Mussa, Masson, Swoboda, Jadresic, and Berg (2000) for discussions of exchange rate arrangements in developing countries. Table 1 is compiled from the IMF's *International Financial Statistics* (various issues) by removing industrialized countries.

[3] Beginning January 1999, the IMF introduced a new classification of categories that include: (a) exchange arrangements with no separate legal tender; (b) currency board arrangements; (c) other conventional fixed peg arrangements (including *de facto* peg arrangements under managed floating); (d) pegged exchange rates within horizontal bands; (e) crawling pegs; (f) exchange rates within crawling bands; (g) managed floating with no preannounced path for exchange rate; and (h) independently floating. As the new classification is not strictly comparable to earlier classifications, I have decided to compile Table 1 according to the earlier classification, assuming that (a), (b), and (c) belong to a "fixed rate arrangement," (d) is "limited exchange rate flexibility," (e), (f), and (g) belong to "managed floating," and (h) is "independently floating." The last two combined are a "more flexible rate arrangement."

stabilize their exchange rates. Indeed, 80 countries (49 percent of the total) were on "fixed exchange rate arrangements" and "limited exchange rate flexibility" in 2001. In addition, some countries under "more flexible arrangements" are known to have stabilized their exchange rates vis-à-vis a certain currency or a basket of currencies.

Focusing on the fixed rate arrangements in the developing world, as of December 2001, the US dollar is the most popular target currency (for 42 developing countries including 4 countries under "flexibility limited in terms of a single currency"), followed by the euro (formerly the French franc for 15 countries, the Deutsche mark for 4 countries and the Portuguese escudo and the Italian lire for 1 country each after January 1999), non-SDR currency baskets (for 9 countries), and the SDR (for 1 country).[4] It is noteworthy to observe that no developing country pegs its exchange rate any longer to the UK pound sterling, particularly since 1986, or to the Japanese yen throughout the period.

2. "Observed" Exchange Rate Arrangements: Quantitative Analyses

The "official" exchange rate arrangements provide information about the nature of the arrangements as reported by individual countries and, where appropriate, reclassified by the IMF when formally reported arrangements are different from the actual practices. However, these official arrangements still do not accurately describe the actual practice of exchange rate policies, nor do they offer sufficient information as to which currency or basket of currencies is chosen as a target for *de facto* exchange rate stabilization. To understand what exchange rate arrangements are actually in place, one must statistically examine the observed behavior of relevant variables, particularly exchange rates.[5]

One way to do this is through a regression analysis technique used by Frankel and Wei (1993, 1994, 1995) and to identify which major currency or currency basket is chosen as an anchor for a particular country's exchange rate stabilization and how closely such a relationship can be observed. In this section, we estimate the following type of regression equation:[6]

$$\Delta e^{j}_{t} = \alpha + \beta_1 \Delta e^{USD}_{t} + \beta_2 \Delta e^{DM}_{t} + \beta_3 \Delta e^{JY}_{t} + \beta_4 \Delta e^{FF}_{t} + \beta_5 \Delta e^{UKP}_{t} + u_t,$$

where Δe^{j}_{t} is the monthly change in the log exchange rate of currency j in month t, α is a constant term, β_k (k = 1, 2,...) is the coefficient on the monthly change in the log exchange rate of currency k, and u_t is the residual term. The superscripts, USD, DM, JY, FF, and UKP refer to the US dollar, the Deutsche mark, the Japanese yen, the French franc, and the UK pound sterling, respectively. The estimated standard error of regression residuals can be

[4] Other target currencies for single-currency pegs include the South African rand (for 3 countries), the Indian rupee (for 2 countries), the Australian dollar, and the Singapore dollar (for 1 country each). In the past, the UK pound sterling, the Spanish peseta, and the Russian ruble were also targets for single-currency pegs.

[5] A more detailed study would require analysis of changes in foreign exchange reserves, foreign exchange market pressure, and interest rates.

[6] This exercise is an extension of the studies conducted by the author for an earlier sample period (see Kawai and Akiyama 1998).

interpreted as a measure of exchange rate volatility. A monthly change in the exchange rate is defined by the first difference of the natural logarithm of the nominal exchange rate. For some countries, we use as right-hand side variables the exchange rates of the Special Drawing Rights (SDR), European Currency Unit (ECU), and other relevant minor, regional currencies, reflecting country-specific characteristics. Following Frankel and Wei (1994), we express all the exchange rates in terms of a numeraire currency, the Swiss franc.[7] In this exercise, we have decided to remove data observations with values of log first differences greater than 0.1 in order to minimize the impacts of discrete devaluations or revaluations.[8]

This exercise provides useful information on "observed" exchange rate arrangements for developing countries. The underlying hypothesis is that every country attempts to stabilize the exchange rate to a basket of multiple currencies. First, it can identify specific currencies that comprise a basket in each developing country's exchange rate stabilization policy in terms of the estimated coefficients in the regression equation. Exchange rate stabilization to a single currency can be interpreted as a special case in which only one currency is identified with a significant and large positive coefficient, while other currencies' coefficients are small and statistically insignificant. Second, it can identify the degree to which the authorities allow or limit exchange rate flexibility depending on the size of exchange rate volatility as measured by the estimated standard error of regression. A large size of the estimated standard error of regression implies that the authorities allow relatively large exchange rate flexibility while a small size indicates that they attempt to stabilize their exchange rates.

Based on the regression analysis, developing economies can be classified into three broad categories according to their "observed" exchange rate arrangements, that is, pegged, intermediate, and flexible, depending on the size of exchange rate volatility. Specifically, countries are classified to be under the "pegged" arrangement when volatility is less than 0.0075, "intermediate" when volatility is between 0.0075 and 0.0150, and "flexible" when volatility exceeds 0.0150.[9] Table 2 summarizes this information for the period 1980-1999 by dividing the whole sample into 5-year sub-samples. The size of exchange rate volatility is shown next to each country's name as well as the number of excluded observations due to large, discrete exchange rate changes. Economies in each category are further classified into three groups, that is, USD, other single currency, and a basket of currencies, depending on what currency or currency basket is assigned a significant weight in the regression equation.

[7] In other papers, Frankel and Wei (1993, 1995) use the SDR as a numeraire currency, but we do not follow this procedure because our study regards the SDR as a potential candidate for a nominal anchor.

[8] We have done so because countries often change their parities or central rates to accommodate persistent differences in inflation rates or productivities vis-à-vis their nominal anchor-currency country. Without eliminating the effects of such discrete devaluations or revaluations, it would be difficult to conclude the presence or absence of a nominal anchor currency for certain countries.

[9] The value 0.0100 is approximately a 1 percent change in monthly exchange rates.

In the table, emerging market economies other than those in East Asia are indicated with light shadows and those in East Asia with thick shadows.[10]

Table 2 reveals several interesting points. First, the number of countries under the "pegged" rate arrangement has declined as a trend, though there was some reversal in this trend in the second half of the 1990s. On the other hand, the number of countries under the "flexible" rate arrangement has risen as a trend. The number of countries under the "intermediate" rate arrangement has risen slightly. In the second half of the 1990s where 157 developing country currencies are examined, 75 countries (48 percent of the total) are under the "pegged" arrangement, 29 countries (18 percent) under the "intermediate" arrangement, and 53 countries (34 percent) under the "flexible" arrangement. Second, regardless of the extent of exchange rate flexibility, almost all developing countries appear to have their own preferred anchor in terms of a single currency or a basket of currencies. The US dollar is the most preferred anchor currency (for 84 countries or 54 percent of all developing countries in the second half of the 1990s), followed by a basket of currencies (for 41 countries or 26 percent) and other single currencies (for 31 countries or 20 percent). There were very few countries where anchor currencies could not be identified. Third, until the mid-1990s, a majority of non-East Asian emerging economies were under the "flexible" or "intermediate" arrangements, while most of the East Asian emerging economies were under the "pegged" or "intermediate" arrangements. That is, emerging economies in East Asia showed stronger preferences for exchange rate stability—or a stronger "fear of floating"—than those in non-East Asia. However, crisis-affected countries and Singapore were forced to shift to the "flexible" arrangement due to the outbreak of currency crisis in the second half of the 1990s.

While an increasing number of developing countries shifted away from fixed towards more flexible exchange rate arrangements on an "official" basis by the 1990s, almost all countries attempt to stabilize their exchange rates against a single currency or a currency basket, though the degree of rate stabilization varies considerably across countries. Many countries regard the US dollar as their anchor currency despite the absence of a formal commitment to a US dollar peg. Notable is the fact that quite a few economies are using currency baskets as their anchor without officially announcing it.

3. Formation of Tri-polar Currency Areas

Using the results in the preceding section, we can estimate the size of tri-polar currency areas, that is, currency areas formed by the US dollar, the new European single currency, euro, and the Japanese yen. The objective here is to gain insight into the current state and evolution of the international monetary system by quantitatively gauging the size of major currency areas. Particularly interesting is to evaluate the impact of the creation of the

[10] Non-East Asian emerging market economies include the following: Argentina, Brazil, Chile, Colombia, the Czeck Republic, Hungary, India, Israel, Mexico, Pakistan, Peru, Poland, Russian Federation, South Africa, Turkey and Venezuela.

European Economic and Monetary Union (EMU) and introduction of the euro on the international monetary system. The main question is whether the newly introduced euro is strong enough to seriously challenge the US dollar's dominance and to convert the US-dollar dominated international monetary system into a regime centered on both the US dollar and the euro. Another important question is what role the Japanese yen can play.[11]

Defining currency areas. In this section, we calculate the economic size of a currency area in terms of GDP and trade flows (exports plus imports), expressed as current US dollar values. By using different economic variables as the basis for measuring the size of currency areas, we can further our understanding of the importance of the major currencies as nominal anchors for the rest of the world. As major currencies, we again consider those of the G-5 countries (i.e., the United States, Germany, France, the United Kingdom, and Japan) in addition to the SDR and the ECU.

In this calculation, we undertake the following four steps: First, each of the G-5 currencies is assumed to form a currency area of its own. If any country rigidly pegs its exchange rate to a particular G-5 currency, its entire economy, measured by GDP or trade flows, is classified as belonging to the currency area formed by this particular currency. If a country stabilizes its exchange rate to a basket of multiple currencies, its economy is divided into fractions of major currency areas according to the weights assigned to these major currencies in a basket. The coefficients that were estimated in the previous section as statistically significant, at least at the 5% level, are interpreted as the weights assigned to the corresponding currencies. If a country does not stabilize its exchange rate against any single currency or currency basket, its economy is considered not to belong to any currency area; it adopts flexible exchange rates vis-à-vis the major currencies. In essence, we divide each individual country into different fractions of currency areas and then calculate the size of a currency area for the world as a whole by summing the corresponding fractions over all countries.[12]

Second, the weights assigned to anchor currencies are obtained from the estimated coefficients of a regression equation that are positive and statistically significant at the 5% level or above. If the sum of the estimated coefficients is equal to or less than one, their values are used as weights. If the sum exceeds unity, all the coefficients are proportionally

[11] See Alogoskoufis and Portes (1997) and Bergsten (1997) who argue that the introduction of the euro will challenge the US dollar dominance and convert the international monetary system into a bipolar system centered on both the US dollar and the euro. They do not see much potential for the Japanese yen to grow into another dominant international currency.

[12] We use annual data for the period from 1980 through 1999. Most data series are taken from the IFS and, if necessary, are supplemented by national sources. Data for GDP and trade flows are converted into US dollars at the annual average exchange rate. We have selected only those countries where data series for GDP and trade flows are available from 1980 through 1999. Transition countries in Central and Eastern Europe and in the former Soviet bloc are under-represented in our sample due to the lack of data in earlier periods. Many African countries are also absent in the sample. In terms of economic size, however, our sample of 99 countries covers a substantial amount of economic activity and trade flows throughout the world.

re-scaled downward to make the sum equal to one and the re-scaled coefficients are used as weights.

Third, using procedures similar to the first step, we also calculate the size of the currency area formed by the currency of a minor, regional country—like Australia, India, New Zealand, Portugal, Singapore, South Africa, and Spain. We next distribute the currency area formed by such a minor, regional currency to the larger currency areas formed by the G-5 currencies, the SDR and the ECU, by using the estimated regression coefficients for each minor, regional currency. We also distribute the currency areas formed by the SDR and the ECU to G-5 currency areas, by using the estimated regression coefficients for these composite currencies. In this way, a country can be divided into fractions of G-5 currency areas when it stabilizes its currency to a minor, regional currency, the SDR, or the ECU. The size of any G-5 currency area can be computed by aggregating the relevant fractions over all countries.

***Currency Areas formed by the euro, the US dollar, and the Japanese yen*.** Finally, we calculate the global size of the euro area, by adding the size of EMU members and the currency areas formed by the French franc (FF) and the Deutsche mark (DM)—and by the UK pound sterling depending on the definition of the euro area—for non-EMU countries.[13] A sample of 99 countries is used for such calculations. We consider two cases with regard to the scope of the euro area, depending on which countries form the EMU: the current case of the EU-Twelve (Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, and Spain) forming the EMU, and the prospective case of the EU-Fifteen (the EU-Twelve plus Denmark, Sweden, and the United Kingdom) forming the EMU. The latter case defines the maximum possible size of the EMU in the conceivable future because it also assumes that the transition economies in Central and Eastern Europe and the Baltic states also stabilize their currencies to the euro.[14] If EMU membership is expanded to include all European Union countries, the size of the euro area will be correspondingly larger while the size of the US dollar area will become smaller. The size of the Japanese yen area will probably not be affected much by the scale of EMU membership.

Table 3 summarizes the results of these calculations. The table reports the relative economic shares for each of the three major currency areas, based on GDP and total trade flows, for developing as well as developed countries. It shows that choice of measurement, GDP or trade flows, influences the size of the US dollar and euro areas. Taking the case of EMU-Fifteen, the GDP measure indicates that the US dollar area will become larger than the euro area. For example, 45 percent of the world economy is covered by the US dollar area,

[13] For this purpose, similar regressions have also been run for non-EMU developed countries. These countries have been divided into fractions of G-5 currency areas, and these fractions have been added to obtain global currency areas formed by G-5 currencies.

[14] Honohan and Lane (1999) claim that the Central and Eastern European countries and Former Soviet Union countries willing to be EU members are expected to stabilize their currencies vis-à-vis the euro if they have not done so already.

37 percent by the euro area, and 17 percent by the Japanese yen area. The US dollar area is large because many developing countries, particularly those in Asia and Latin America, regard the dollar as the most important nominal anchor. The size of the dollar area outside the United States is about 19 percent of the World's GDP, of which the developing world accounts for 16 percent. In contrast, the size of the euro area outside the EMU-15 members is 7.5 percent of the world's GDP, of which the developing world accounts for 5 percent. The Japanese yen area's share (17 percent) is only slightly bigger than the weight of the Japanese economy in the world (16 percent).[15] The yen area outside Japan is small and accounts for only 1 percent of the world's GDP, which underlines the fact that the yen is not yet a full-fledged, global nominal anchor currency.

The trade flow measure indicates that the euro area will be larger than the US dollar area. The euro area accounts for 50 percent of the world total trade flows, the US dollar area 40 percent and the yen area a meager 9 percent. Interpretation of trade-based economic size needs caution because the underlying trade flows do not net out intra-EMU trade flows, and the predominance of the euro area measured by trade activity may be exaggerated. Essentially, the relative economic size of the euro area depends on which economic activity will be considered more important to the world as a whole, real economic activity or trade activity.

4. Preference for Exchange Rate Stability in Emerging Market Economies

The results described above reveal that the "observed" exchange rate arrangements are largely consistent with the "official" exchange rate policies, with some exceptions. The results also provide several stylized facts and general conclusions about the individual developing economies' exchange rate arrangements.

First, many developing countries have shifted their "official" exchange rate arrangements from "fixed" to "more flexible" rate regimes. However, they often exhibit preferences toward stable exchange rates vis-à-vis a single currency or a currency basket. Countries facing large exchange rate fluctuations against major international currencies were those in economic transition in Eastern Europe or the former Soviet Union at an early stage or economies subject to chronically high inflation.

Second, non-East Asian emerging market economies tend to have the "flexible" or "intermediate" arrangement, while the East Asian emerging economies tend to choose the "pegged" or "intermediate" arrangement. The East Asian economies appear to exhibit greater preference for exchange rate stability or a greater fear of floating than their non-East Asian counterparts.

[15] These relative share numbers correspond to the figures estimated by other authors such as Bergsten (1997) and Masson and Turtleboom (1997).

Third, the US dollar is the most favored anchor currency for exchange rate stabilization in the developing world. However, significant diversity exists across regions globally in exchange rate arrangements. For African countries, their major exchange-rate stabilization anchors are the euro (formerly the French franc), the US dollar, and the SDR. Asian economies generally attempt to stabilize their exchange rates vis-à-vis the US dollar, the SDR and a few regional currencies. The Japanese yen has not played a major anchor currency role even in East Asia. The transition economies in Central and Eastern Europe and the former Soviet Union have not experienced stable exchange rates or stable arrangements in general, but many of them are expected to eventually stabilize the currencies to the euro. The Middle East includes countries that have successfully stabilized exchange rates vis-à-vis the US dollar and/or the SDR. The whole of Latin America is a *de facto* US dollar area, and even countries not officially pegging exchange rates to the US dollar do assign significantly positive, and close to unitary, weights to the dollar.

Fourth, a developing country's choice of anchor currency for exchange rate stabilization depends largely on which currency areas the country tends to trade with, as well as on the country's geographical location and its past colonial ties.[16] For example, a country that trades heavily with the US dollar area tends to choose the dollar as an exchange rate stabilization anchor. By implication, a country that trades with several currency areas with more or less equal shares is expected to choose a well-balanced currency basket as its anchor for exchange rate stabilization.

III. THE EAST ASIAN EXCHANGE RATE ARRANGEMENTS

In this section, we attempt to identify the exchange rate arrangements that have prevailed in East Asia, particularly in former crisis countries and the neighboring emerging economies, before and after the 1997-98 currency crisis. An important question is what the factors are behind the choice of exchange rate arrangements in the pre-crisis as well as post-crisis periods.

1. Changes in the Official Exchange Rate Arrangements in East Asia

In order to identify the exchange rate arrangements in emerging East Asia in the pre-crisis and post-crisis periods, it is useful first to take a look at the official exchange rate arrangements as published by the IMF. Table 4 summarizes changes in exchange rate arrangements in not only the former crisis countries—Indonesia, Korea, Malaysia, the Philippines, and Thailand—but also Japan, China, Hong Kong, Taiwan and other ASEAN countries.

Table 4 indicates several facts. First, emerging East Asia has exhibited a variety of exchange rate arrangements, ranging from a currency board system (Hong Kong) to independently floating (Philippines). In between these two polar cases, there are conventional

[16] See Kawai and Akiyama (2000) for such empirical evidence.

fixed pegs to a single currency (China and post-crisis Malaysia) or a currency basket (Singapore and pre-crisis Thailand) as well as managed floating (pre-crisis Korea, Indonesia and Singapore). Second, three (Korea, Indonesia, and Thailand) out of the five former crisis countries saw a change in their official exchange rate arrangements in the direction of greater exchange rate flexibility, while Malaysia moved in the opposite direction. Hong Kong, Singapore, Taiwan and the Philippines have maintained identical exchange rate arrangements in the pre- and post-crisis periods.

However, "official" exchange rate arrangements may not describe the accurate state and evolution of the exchange rate policies in emerging East Asia, particularly those in former crisis countries. First, countries under managed floating (Korea, Indonesia and Malaysia) or independently floating (the Philippines) in the pre-crisis period may have had a regime more akin to pegged arrangements because otherwise they would not have been subjected to currency speculation. Second, one may wonder whether countries, particularly former crisis nations that have adopted independently floating in the post-crisis period have really been floating their exchange rates. The "fear of floating" argument hypothesizes that despite the officially declared arrangement, the actual practice of exchange rate management is close to managed or pegged arrangements. Indeed McKinnon (2001) and others claim that the former crisis countries have reverted to pre-crisis, dollar-based exchange rate arrangements.

It is thus important to examine the actual behavior of the exchange rates for emerging economies in East Asia, particularly for former crisis countries, and empirically identify their pre-crisis arrangements and changes in such arrangements in the post-crisis period by looking at data in a more detailed way.

2. The Changing Roles of the US Dollar, the Yen and the Euro in East Asia

The hypothesis here is that the roles of the US dollar, the Japanese yen, and the euro (or its predecessor) as anchors for exchange rate stabilization have changed since the outbreak of the East Asian currency crisis. A Frankel-Wei type of regression of daily movements in each economy's exchange rate on the movements of three major international currencies facilitates a convenient comparison of the roles of the tri-polar currencies across major emerging East Asian economies as well as over time.

As in the previous case, the daily change in the log exchange rate of each East Asian currency is regressed on the daily changes in the log exchange rates of the US dollar, the Japanese yen, and the euro—or the ECU before the introduction of the euro on January 1, 1999. All exchange rates are again expressed vis-à-vis the Swiss franc. More specifically, we estimate the following regression equation:

$$\Delta e^{j}_{t} = \alpha + \beta_1 \Delta e^{USD}_{t} + \beta_2 \Delta e^{JY}_{t} + \beta_3 \Delta e^{EURO}_{t} + v_t,$$

where Δe^{j}_{t} is the daily change in the log exchange rate of currency j in day t, α is a constant term, β_k (k = 1, 2,...) is the coefficient on the daily change in the log exchange rate of currency k, and v_t is the residual term. The superscripts, USD, JY and EURO respectively

refer to the US dollar, the Japanese yen, and the euro. As in the previous case, the estimated coefficients are interpreted as the weights assigned by the authorities to the corresponding currencies in their exchange rate policies. Similarly, the estimated standard error of regression residuals can be interpreted as a measure of exchange rate volatility.

Table 5 summarizes the regression results for each emerging economy in East Asia over the sample period January 1990 through June 2002. The sample is divided into 18-month sub-samples. The mid-crisis period (July 1997 - December 1998) is indicated with shadows.

Pre-crisis period. Table 5 confirms that in the pre-crisis period (January 1990 - June 1997), the estimated coefficients of the US dollar were statistically significant and close to unity, the R^2-adjusted was close to 1, and the estimated standard errors of regression were small for almost all economies—particularly Hong Kong, Korea, Indonesia, and Thailand (for the first half of the 1990s). In the case of Singapore and Malaysia, the US dollar coefficients were somewhat lower, though generally greater than 0.75 and highly significant, due to their formal or informal currency basket arrangements. In the case of Taiwan, the Philippines, Thailand (for the eighteen months prior to the bhat crisis) and China (the first half of the 1990s), the R^2-adjusted is somewhat lower and the estimated standard error of regression somewhat higher. In Thailand, speculative activity that had begun in 1996 and mounted in February and May 1997 had already affected the currency movement prior to the outbreak of the baht crisis.

These results support the proposition that many emerging East Asian economies were on *de jure* or *de facto* US dollar-stabilization arrangements until the time of the crisis. Nonetheless, the estimated coefficients of the Japanese yen were also significant, for some sub-sample periods, in Singapore, Thailand, Korea, and Malaysia, though the size of its coefficients rarely exceeded 0.1. In this sense, the Japanese yen played a limited role as part of a currency basket in the pre-crisis period. The euro—more accurately, its predecessor ECU—also played some role in Singapore, Malaysia, and Thailand due to the nature of their currency basket arrangements though it was relatively insignificant in other countries.[17]

Mid-crisis period. Not surprisingly, many former crisis countries in East Asia experienced noticeable declines in US dollar weights and in the R^2-adjusted in the mid-crisis period (July 1997-December 1998). This was particularly pronounced in Indonesia and Thailand. In the case of Korea, Malaysia and the Philippines, the estimated coefficients on the US dollar did not decline noticeably, but the R^2-adjusted declined sharply and the estimated standard error of regression rose sharply.[18] Even countries not directly affected by

[17] The observed role of the Japanese yen and the euro in a currency basket for some countries such as Singapore, however, may reflect the fact that the authorities chose the SDR as a target in their exchange rate management. The Japanese yen and the European currencies making up the euro were important components of the SDR.

[18] The less noticeable decline in the US dollar coefficient in Malaysia may be explained by the authorities' move to fix the Malaysian ringgit to the US dollar on September 2, 1998. If the mid-crisis sample period were shortened to, say July 1997-August 1998, the decline in US dollar coefficients would be more pronounced. A

(continued)

the crisis, such as Singapore and Taiwan, also saw declines in the US dollar coefficients and in the R^2-adjusted. In the case of Singapore, the central rates were changed a few times in order to weather the currency crisis occurring in the neighboring countries. But these changes were much less pronounced than those for the former crisis country currencies. Hong Kong and China were relatively immune to currency speculation as far as the observed movements of spot exchange rates are concerned.[19]

As the US dollar weights declined in the mid-crisis period, the weights of the Japanese yen rose in a significant way in some countries, particularly in Indonesia, Singapore, Thailand, and Malaysia. The size of the yen coefficients jumped upwards to 0.7 in Indonesia and to 0.3 in other countries. Only in Korea and China, were the yen coefficients statistically insignificant. The euro coefficients were relatively unaffected by the crisis. Generally speaking, the importance of the Japanese yen in the currency baskets of many countries rose during the crisis, while the euro's importance did not.

Post-crisis period. The results for the post-crisis period (January 1999-June 2002) indicate a greater diversity in exchange rate arrangements than in the pre-crisis period. A few countries have returned to the pre-crisis pattern of US dollar-based exchange rate arrangement, while others have departed from the pre-crisis arrangement. At one extreme, economies under a stable US-dollar peg throughout the period, such as China and Hong Kong, have maintained US dollar coefficients at levels close to unity, the R^2-adjusted close to 1, and the estimated standard errors of regression even smaller than in the pre-crisis period. Malaysia returned to a formal US dollar-peg arrangement and the regression results indeed confirm it. Taiwan has been stabilizing the currency to the US dollar in a way tighter than in the pre-crisis period as judged from a larger size of the R^2-adjusted and a smaller size of the estimated standard error of regression.

Indonesia is at the other extreme where, despite large coefficients on the US dollar in some post-crisis sub-samples, the R^2-adjusted is much lower and the estimated standard error of regression much higher than in the pre-crisis period. In this sense, Indonesia has been maintaining an exchange rate arrangement that is most akin to freely floating among the

---

series of 3-month period rolling regressions strongly indicates this tendency (see the Appendix Table). The rolling regression procedure allows us to analyze the mid-crisis period more carefully because of regional contagion, delayed currency attacks (Indonesia and Korea) and large exchange rate depreciations at times of political uncertainty (Indonesia).

[19] Though the spot exchange rate movement does not reveal it, the Hong Kong dollar was under serious attack in August 1998. The authorities resorted to the unorthodox measure to contain speculative pressures, by intervening in the stock market and purchasing HK$ 118 billion of domestic equities in a period of about two weeks. They intervened in the stock market because speculators shorted the currency and stock markets simultaneously, hoping to profit from the lower stock price that could result from high interest rates needed to support the exchange rate under the pressure of short selling the Hong Kong dollar. This intervention was also accompanied by a variety of measures, including increases in the cost of speculation in financial markets—tighter enforcement of rules on short selling and settlement of trades, and higher margin requirements in the futures markets. Aided by an improvement in the external environment, the intervention eventually succeeded in calming markets.

emerging East Asian economies, despite the fact that Bank Indonesia has often intervened in the foreign exchange market to smooth the rupiah/US dollar exchange rate. Essentially, Indonesia has not been able to restore exchange rate stability despite interventions because of the country's difficult economic (and social and political) problems.

In between these two groups, there are countries that exhibit statistically significant US dollar coefficients but with a lower value (the Philippines) or with a lower R^2-adjusted (Korea, Singapore, Thailand and the Philippines). What is interesting for these countries is that the yen coefficients take values 0.2-0.3 and are statistically significant, except for the Philippines, and the US dollar coefficients in the most recent sub-sample periods are lower than in the pre-crisis period. For these economies, it is hard to conclude that they have reverted to pre-crisis US dollar-based exchange rate stabilization policies or that they have shifted to freely floating rate arrangements. Their exchange rates are more flexible than in the pre-crisis period, but more stable than those of a typical free floating industrial country. Korea and Thailand, in particular, appear to have shifted to *de facto* managed floating with a currency basket arrangement with a relatively large weight on the US dollar (in the order of 0.6-0.7) and a smaller, but significant, weight on the Japanese yen (in the order of 0.2-0.3). The observed pattern of these countries' *de facto* basket arrangements is very similar to that of Singapore, which is known to have maintained a managed float with a currency basket system. It remains to be seen whether this shift reflects a permanent change in these countries' exchange rate policies or a temporary adjustment of their exchange rates to rapid yen/US dollar rate movements.[20]

3. Rationale for and Problems of Dollar-based Stabilization Policy

Despite post-crisis divergence in exchange rate arrangements, the fact is that the US dollar continues to play a dominant anchor currency role in emerging economies in East Asia.[21] The East Asian currencies with a large weight on the US dollar in their currency baskets in the pre-crisis period, became overvalued on a real, effective basis due to both higher domestic inflation than in the United States and the US dollar's appreciation since mid-1995 vis-à-vis the major industrialized currencies, particularly the Japanese yen and the Deutsche mark. The emergence of real, effective overvaluation of the currencies was an important factor behind the mounting speculative pressure that developed in the foreign

[20] Kawai and Akiyama (2000) and McKinnon (2000, 2001) have observed a reversion of the post-crisis exchange rate arrangement of emerging East Asia to an arrangement akin to the pre-crisis *de facto* US dollar-based stabilization policies. Their analyses were based on data until 1999 or early 2000. But with longer time series data available, one can observe a variety of exchange rate arrangements in post-crisis East Asia, ranging from a US-dollar hard peg (Hong Kong) and a soft peg (China, Malaysia) to a managed float with currency basket arrangements (Singapore, Korea and Thailand), and to freely floating (Indonesia).

[21] The relatively high US dollar weights observed in the post-crisis regressions, with the exception of Indonesia, may indicate that the monetary authorities continue to regard the US dollar as the most relevant anchor currency for their exchange rate policies despite their stated objective of free floating (with the notable exception of Malaysia), or that the market is simply driving each country's exchange rate in parallel with the US dollar. Whatever the interpretation, the US dollar continues to play a dominant, reference currency role in the region.

exchange market in 1997.[22] Hence, the *de facto* US dollar-peg system was one of the underlying triggers of the currency crisis. The issue is whether the continued importance of the US dollar, including the post-crisis resurrection of the US dollar standard (McKinnon 2001) in some countries, is a desirable and sustainable arrangement for East Asia. We must discuss the issues of the "peg" and the "US dollar" separately.

***De facto currency stabilization*.** The first question is why many emerging East Asian economies have chosen *de jure* or *de facto* currency stabilization rather than "pure floating." First, emerging economies in East Asia preferred exchange rate stability reflecting their desire to promote trade and FDI for economic growth. Excessive exchange rate movements under free floating have been considered as inappropriate for outward-oriented economies, because of the harmful impacts on trade, investment and growth rates. Small, open and highly trade-dependent economies, like those in East Asia, benefit from exchange rate stability through creating stable environments for trade- and FDI-driven economic development and growth, and avoiding regional beggar-thy-neighbor policies of competitive depreciation. McKinnon (2000) claims that exchange rate stability was an important factor behind the remarkable economic performance during the East Asian Miracle period of the mid-1960s through the mid-1990s.

Second, the emerging economies in East Asia needed to establish a nominal anchor due to the lack of credible monetary policy, to rely on foreign currency for external financing due to the so-called "original sin" (Eichengreen and Hausmann 1999; Hausmann 2001), or simply to overcome their "fear of floating" (Calvo and Reinhart 2002). "Original sin" is a situation where emerging economy residents cannot borrow abroad in domestic currency nor borrow long term, even domestically. Hence domestic investments tend to have a currency mismatch or a maturity mismatch or both, thus creating balance sheet vulnerabilities to sharp exchange rate changes. Given that hedging instruments are not fully available in these markets, the government can stabilize exchange rates in order to mitigate the potential foreign exchange risk.

In economies like the United Sates, Japan, or Western Europe, free floating is less harmful because the financial markets are deeper and economic systems are more resilient. But emerging market economies with shallower financial and currency markets have limited ability to absorb large exchange rate fluctuations. In addition, currency futures and forward markets are not adequately developed in these emerging economies due to the lack of well-functioning domestic bond markets (McKinnon and Schnabl 2002). For these reasons, the authorities in the emerging market economies have preferred some degree of exchange rate stability.[23]

---

[22] This was compounded with weaknesses of the domestic financial institutions, particularly in Thailand, which triggered the twin crises in the domestic financial system and the external capital account.

[23] On the other hand, adoption of the two-corner solution" approach (Eichengreen 1994 and Obstfeld and Rogoff 1995) would be unrealistic, with a few exceptions (e.g., Hong Kong and Brunei). In the longer run, however, one of the corner solutions, that is, introducing a common currency through coordinated regional integration may be feasible and even desirable from optimum currency area criteria. For example, Bayoumi and

(continued)

De-facto US dollar-based stabilization. Rapid economic development and growth in the Asian NIEs, the ASEAN countries, and China in the ten years prior to the outbreak of the crisis had been stimulated by their stabilization to the US dollar. In the face of steep yen rate appreciation that began in the mid-1980s, the *de facto* US dollar-pegged system allowed these economies to receive FDI from Japan and to integrate themselves with the regional and global trading system. As Japan had already been gradually losing its international price competitiveness in the low- to mid-tech manufacturing products, yen rate appreciation accelerated this process by forcing Japanese firms to move their production facilities to emerging East Asia. From the latter's perspectives, their exchange rate depreciation vis-à-vis the Japanese yen helped transform them into attractive production bases and platforms, for Japanese multinationals, to export products to the US and European markets. This process promoted international division of labor in the manufacturing sector within the region and helped these economies industrialize and grow, at least until early 1995 when the yen rate started to depreciate rapidly.

Thus there is no doubt that the emerging East Asian economies had enjoyed large benefits, for a long time until the mid-1990s, by choosing the US dollar as an anchor for exchange rate stabilization. But it is hard to argue that these economies adopted a *de facto* US dollar-peg, expecting such developmental benefits. So the next question is why the East Asian economies have chosen the US dollar as an anchor currency for exchange rate stabilization. Several reasons can be given.

First, the US dollar has been chosen because it has been used extensively as an invoicing currency for international trade and as a vehicle currency for currency transactions in East Asia and in other parts of the world.[24] For each East Asian economy, stabilizing the value of its trade and transactions in terms of the US dollar was a reasonable policy given that its neighbors and many other countries in the world willingly used the US dollar for trade invoicing and foreign exchange market transactions.

Second, because the bond and forward exchange markets are incomplete in emerging East Asia, governments are induced to provide an informal hedge by stabilizing the exchange rate against the US dollar. This makes sense because spot and forward transactions are still possible in the US dollar markets.

Eichengreen (1994) found that Northeast Asia (Japan, Korea, and Taiwan) and Southeast Asia (Hong Kong, Indonesia, Malaysia, Singapore, and perhaps Thailand), in addition to Northern Europe (but not the entirety of Western Europe), were respectively plausible candidates for monetary union. Bayoumi, Eichengreen and Mauro (2000) concluded that in terms of preparedness for monetary union, Asia in 1995 was not much different from continental Europe in 1987. But the lack of political commitment and institutional capacity would make such a move difficult in the short to medium term.

[24] Commodities and primary products exported by many developing countries tend to be priced in the US dollar in the global markets.

Third, a US-dollar-based system was an arrangement that implicitly guaranteed intra-regional exchange rate stability for the East Asian economies. Several authors have noted that the *de facto* US dollar-based system helped promote intra-regional exchange rate stability, an important policy objective for a highly interdependent region such as East Asia (Bayoumi, Eichengreen, and Mauro, 2000; McKinnon, 2000). The arrangement essentially avoided harmful beggar-thy-neighbor exchange rate competition, thereby ensuring environments conducive to outward-oriented economic growth for the region as a whole.

Problems of US dollar-based stabilization. Even though some degree of exchange rate stability is desirable for the emerging East Asian economies, there are several problems associated with choosing the US dollar as the sole nominal anchor currency in these economies.

First, using the US dollar as the sole anchor is problematic given that the emerging East Asian economies have diverse economic relationships with the United States, Japan, and the European Union through trade (exports and imports), FDI inflows, and other forms of capital flows. For emerging East Asia, the United States is no longer the most dominant economic partner and that the relative importance of Japan and the European Union is as large as, and in some cases much larger than, that of the United States. The United States is not necessarily the most dominant partner country for emerging East Asia's trade (Table 6) and Japan is the most dominant partner as an import and FDI source country (Table 7).

Second, against the benefit of intra-regional exchange rate stability guaranteed by the informal dollar-based arrangements, there is a cost in terms of excessive movements in effective exchange rates induced by yen/dollar rate fluctuations. When the yen began to depreciate vis-à-vis the US dollar in the spring of 1995, emerging East Asian economies saw their international price competitiveness deteriorate. Growth driven by Japanese FDI inflows began to lose its momentum. In addition, yen depreciation dampened real economic activity in relatively advanced emerging East Asian economies (such as Korea, Taiwan, and Malaysia) that competed against Japan in third markets in the United States and Europe. If the Japanese yen had continued to experience the "ever higher yen syndrome" (McKinnon and Ohno 1997), then exchange rate stabilization vis-à-vis the US dollar would have been attractive to emerging East Asia. Once the yen/dollar exchange rate became volatile, however, US dollar-based exchange rate regimes began to produce wide fluctuations of economic activity, severely limiting its benefits. The reason for the close association between yen/dollar exchange rate movements and the real economic activity of some emerging East Asian economies is that they not only trade with Japan, but also compete with Japan in third markets in certain products.

The diverse economic linkages of emerging East Asia with the rest of the world suggest that exchange rate stabilization vis-à-vis the US dollar alone is not the best policy. Rate stabilization vis-à-vis a well-balanced currency basket comprising the US dollar, the Japanese yen and the euro is a more reasonable option. The reason is that exchange rate stabilization against a currency of a major trading partner means the lack of exchange rate stability against a currency of another major trading partner as long as the exchange rates of

these major countries fluctuate in a volatile way. A currency basket arrangement ensures relative stability on the average of a country's external currency value vis-à-vis major trading partners.[25] This approach offers a better buffer to an economy's exposure to yen/dollar and dollar/euro exchange rate volatility.[26]

IV. FUTURE OF THE EAST ASIAN EXCHANGE RATE ARRANGEMENT

1.Options for Possible Arrangements

While the popular "two corner solution" view gives exclusive attention to the objective of crisis prevention, emerging market economies can pursue other legitimate objectives such as growth, trade and investment promotion through their use of exchange rate policy. A desirable option for many merging market economies, including those in East Asia, would be neither a pure float because of the potential for excessive volatility and misalignment and the consequent "fear of floating," nor a hard peg except in a very small open economy like Hong Kong.

In view of the impossibility of any country achieving a trinity of simultaneously stable exchange rates, monetary policy autonomy, and free mobility of capital, the authorities must make a desirable trade-off. Given the open capital account in most of emerging East Asia (except in China), a desirable trade-off would be to ensure a certain degree of monetary policy autonomy and loose exchange rate stability. In China where capital account transactions are still limited, the authorities can pursue both stable exchange rates and monetary policy autonomy.

Numerous proposals have been made by several authors, including the US dollar standard (McKinnon 2001; MacKinnon and Schnabl 2002; Mundell 2001), a G-3 currency basket system (Williamson 1999a, 1999b, 2000, 2001; Kawai and Akiyama 2000; Kawai and Takagi 2000; Ogawa and Ito 2000; French and Japanese Staff 2001; Ito 2001), and regional monetary union (Wyplosz 2001).

A proposal for the US dollar standard emphasizes the advantage for the emerging East Asian economies to use the existing, most dominant international currency in the region, i.e., the US dollar, while minimizing the yen/US dollar exchange rate fluctuations. The US dollar standard is a formalization of the existing *de facto* arrangement, is simple and transparent, and involves no additional cost in ensuring both interregional and intra-regional exchange rate stability. However, the US dollar standard would result in undesirable fluctuations in effective exchange rates as long as yen/US dollar exchange rate fluctuations continue.

---

[25] As discussed in Kawai and Akiyama (2000), an economy that has diversified trade and FDI relationships with the major currency areas has strong potential for choosing a well-balanced currency basket.

[26] A basket system would have preserved more stable effective exchange rates at the time when the US dollar began to appreciate in the spring of 1995, without resulting in a loss of international price competitiveness or an overvaluation of currencies in emerging East Asia.

The G-3 currency basket system proposal claims that linking the central rate of a country's national currency to a basket of major G-3 currencies, i.e., the US dollar, the Japanese yen, and the euro, rather than the US dollar alone, is more desirable. The tightness of the link and the currency weights may initially be left to each country's choice, with the possibility for closer coordination as the authorities realize the importance of intra-regional exchange rate stability. The virtue of this system is that it would prevent excessive fluctuations in effective exchange rates in the face of volatile yen/dollar rate movements, while allowing their currency some flexibility to move within a certain range.

Advocates of regional monetary union claim that a G-3 currency basket system treats the Japanese yen asymmetrically relative to other East Asian currencies, thus providing the Bank of Japan with the ability to pursue an independent monetary policy, without paying formal attention to the external value of the yen. To the extent that this special position of Japan may jeopardize the goal of intra-regional exchange rate stability, Japan may also be encouraged to pay due attention to the external value of the yen. In the spirit of regional cooperation, a more symmetric approach may be taken, e.g., an Asian Monetary System (patterned after the European Monetary System) or even East Asia's own Economic and Monetary Union in a more distant future.

Such an approach makes sense but only in the long run. The region may eventually develop a common currency arrangement, like the euro in Europe. A common currency arrangement, however, cannot be expected to emerge in the near future because of the absence of political commitment within the region and of convergence in macroeconomic conditions and economic structure. A common currency would require a substantially closer coordination of economic policies and a much greater and sufficiently sustained build-up of market infrastructure. A more realistic approach would be for emerging East Asia to shift to a currency basket system now, thereby absorbing the impact of yen/US dollar volatility on their economies, and then to start institution building, strive for deeper economic interdependence, and achieve convergence needed for future monetary integration.

2. A Currency Basket System for Emerging East Asia

Under a currency basket arrangement, a reasonable choice of anchor for exchange rate stabilization is a currency basket that includes the US dollar, the yen and the euro in a more balanced way than in the pre-crisis period.[27] Actual currency weights in the basket will depend on: the relative importance of the United States, Japan and the European Union as trade partners and FDI sources for each East Asian economy; future expectations of trend movements of the yen/US dollar exchange rate; and the success of the newly introduced euro. The extent of exchange rate stability also depends on each economy's specific conditions and preferences.

[27] See also Williamson (1999a, b), Kawai and Akiyama (2000), French and Japanese Staff (2001) and Ito (2001) for similar proposals.

Intra-regional exchange rate stability. The rising intra-regional interdependence through trade and investment in East Asia suggests that economies in the region can benefit from avoiding large fluctuations in intra-regional exchange rates. This is particularly the case for the ASEAN members, which began to implement the ASEAN Free Trade Agreement (AFTA) in January 2002 through lowering tariffs on manufactured products below 5 percent. Essentially, large swings in exchange rates among the ASEAN countries would be counterproductive because they would alter international price competitiveness suddenly and make the prospective free trade agreement unsustainable. One way to maintain stable currencies within ASEAN is to adopt similar currency baskets consisting of the US dollar, the yen and the euro and to loosely stabilize their exchange rates to such baskets. This does not require formal agreements on common baskets or frequent, concerted joint actions in the foreign exchange markets. Instead, the countries have only to choose similar baskets.[28]

Consistency with inflation targeting. Monetary authorities in general cannot pursue simultaneously both nominal exchange rate and inflation targets, when the capital account is open. However, if inflation targeting is defined as a policy of achieving a weighted average of inflation rates of the United States, Japan and the European Union and if nominal exchange rate targeting is defined as a policy of stabilizing the nominal exchange rate vis-à-vis a basket of the US dollar, the Japanese yen and the euro, then these two policies are in fact one and the same as long as the same weights are chosen for inflation and exchange rate targeting, at least in the long run when purchasing power parity (PPP) tends to hold.[29] Nominal exchange rate targeting has one added advantage over inflation targeting cum free floating: By removing the problems associated with a floating rate regime (short-run volatility and medium-run misalignment of exchange rates), a policy of nominal exchange rate targeting (with some bands) can better ensure exchange rate stability in a way consistent with inflation targeting (with some bands). This is particularly the case for East Asia where the economies are small and relatively open so that domestic price inflation reflects international price movements. In essence, a loose peg to a basket of the tri-polar currencies can ensure stabilization of intra-regional exchange rates, while maintaining a targeted range of inflation rates.

A coordinated move to a currency basket system. Even when a currency basket system is desirable, it is not easy for any single emerging East Asian economy to move unilaterally away from the present, US-dollar based arrangement to a new arrangement in which the relative weight of the dollar is smaller and those of the yen and euro larger.[30] The reason is that when neighboring countries stabilize their exchange rates primarily against the US dollar, each economy may not have sufficient incentive to unilaterally alter its own

[28] As the degree of intra-regional integration becomes deeper, however, more concerted actions in the area of exchange rate, monetary and fiscal policies may be called for. And the choice of a "common" currency basket, or even adoption of a common currency, may become desirable. See Williamson (1999a, b, 2000).
[29] See Kawai and Takagi (2000).
[30] Honohan and Lane (1999) emphasized the existence of strategic interdependence in the choice of exchange rate regimes for neighboring countries that compete for exports in third markets and for FDI inflows.

exchange rate policy. Essentially the situation is one of a less desirable equilibrium due to a coordination failure.[31] This demonstrates the potential importance of collective action on the part of emerging East Asia. A coordinated simultaneous move to a currency basket system will result in a more desirable equilibrium situation (Ogawa and Ito 2000).

At least initially, exchange rate policy coordination would simply require emerging economies in the region to adopt a similar currency basket as anchor. The operation of the regional currency basket arrangement requires less formality and greater flexibility than the EMS of 1979-98 did in Europe because the proposed currency basket arrangement including currencies that are external to the region—in contrast to internal currencies in the case of Europe's ECU—does not demand a formal structure of monetary policy and exchange rate coordination. This consideration is important, given the current lack of a commitment to full-fledged regional financial cooperation in East Asia, the diversity in the level of economic and financial developments across countries, the dynamic nature of East Asian economies with rapid structural changes, and possibly differing inflationary tendencies. Economies with different rates of inflation and productivity growth can (and are expected to) adjust the central rates with respect to the basket differently over the medium term. In the absence of sufficient nominal convergence, adjustment for inflation may be just as important as the choice of the basket itself (Ohno 1999).

On a deeper level, as the region becomes more integrated and hence more prepared, in terms of both economic criteria and political climate, for a more permanent commitment to economic and monetary union, greater efforts should be made to build institutions capable of supporting such a commitment. Given the possible endogeneity of the optimum currency area criteria, the process can be self-promoting.

3. Regional Financial Cooperation

Given greater interdependence of the regional economies through trade and investment, intra-regional exchange rate stability, possibly supported by a regional currency basket arrangement, calls for some form of financial cooperation among the financial authorities in the region. One country's exchange rate adjustment can have serious, competitive implications for neighboring countries—hence a need for cooperative behavior. Another good reason for regional coordination is the fact that crisis contagion tends to be concentrated within a region.

Initiatives to strengthen regional financial cooperation in East Asia can be broken into two broad categories: financing arrangements and policy dialogue.[32]

[31] Williamson (1999a) has characterized this informal dollar-based arrangement as a classic collective action problem, whereby each country is compelled to stay close to the US dollar because if fears that appreciation against the dollar would weaken its competitiveness against its regional competitors.
[32] See Kuroda and Kawai (2002).

Financing arrangements. The experience of the 1997-98 crisis has convinced many economies in East Asia that the role of the IMF as an international lender of last resort is limited and that a regional financing facility can play a useful role for crisis prevention and management, through timely and adequate provision of international liquidity in the face of currency attack, contagion and crisis.

Inspired by the successful financial support package for Thailand in August 1997, Japan, with support from Korea and the ASEAN countries that participated in the Thai package, proposed to establish an Asian Monetary Fund (AMF) to supplement IMF resources for crisis prevention, management and resolution. However, the United States and the IMF opposed this proposition on grounds of moral hazard and duplication. They argued: that an East Asian country hit by a currency crisis would bypass the tough conditionality of the IMF and receive easy money from the AMF, thereby creating potential for moral hazard; and that an AMF would be redundant in the presence of an effective global crisis manager, the IMF.

Although an AMF was not created, the East Asian economies have recently agreed on the Chiang Mai Initiative (CMI). The CMI has two components: strengthening the long-standing ASEAN Swap Arrangement by extending its membership to all ASEAN members and increasing the size of swap arrangements; and creating a new network of bilateral swap and repurchase arrangements for the ASEAN+3 members, including China, Japan and Korea. The Initiative is currently in progress; several bilateral swap agreements have been reached and several negotiations are underway (see Table 8).

The basic framework and main principles of bilateral swap arrangements (BSAs) under the CMI include linkages to the IMF, maturity and interest. For example, countries can borrow liquidity collateralized by domestic currencies with government guarantees, rather than offering U.S. treasury bonds as collateral. Members requesting liquidity support can immediately obtain short-term financial assistance for the first 10 percent of the BSA facility without IMF programs, while the remaining 90 percent is provided to the requesting member under an IMF program or an activated Contingent Credit Line. The linkage to IMF conditionality is designed to address the concern that the problems leading to balance of payments difficulties may be fundamental in nature and that the potential moral hazard problem could be non-negligible.[33] Negotiations on the swap arrangements are to be concluded bilaterally, based on the agreed main principles.

Policy dialogue processes. Regional surveillance mechanisms are instrumental to the effective functioning of regional financing arrangements. There are several mechanisms developed for regional policy dialogue and economic surveillance. Three major initiatives include the ASEAN+3 Framework, the Manila Framework and EMEAP (Executive's Meeting of East Asia-Pacific Central Banks). In addition to these, there are other forums,

[33] The swap will be for a period of 90 days, renewable up to seven times, at an interest rate equivalent to the LIBOR plus 150 basis points for the first drawing and first renewal. Thereafter, the premium rises by 50 basis points every two renewals, subject to a maximum of 300 basis points.

including those for trans-regional policy dialogue under the Asia-Pacific Economic Cooperation (APEC) and Asia-Europe Meeting (ASEM).

The common objective of these processes is to strengthen policy dialogue and policymaking capacity through information exchanges, peer reviews and recommendations for action at the regional and national levels. For this purpose, each group monitors global economic conditions, regional macroeconomic developments, capital flows, exchange rates, financial sector conditions, and structural and social policies. Monitoring and analysis of the regional macroeconomic and structural conditions are indispensable both for crisis prevention because of the need to implement corrective policies and for crisis financing because of the need to understand causes of a crisis and to formulate appropriate policy responses.

The ASEAN+3 Economic Review and Policy Dialogue (ERPD) process is the most important among these, particularly given the introduction of the CMI. Its purpose is to strengthen policy dialogue, coordination and collaboration on the financial, monetary and fiscal issues of common interest, focusing initially on issues related to macroeconomic risk management, monitoring of regional capital flows, strengthening of the banking and financial systems, better corporate governance, reform of the international financial architecture, and enhancing self-help and support mechanisms in East Asia. Steps have been taken for cooperation in monitoring short-tem capital flows and developing a regional early warning system to assess regional financial vulnerabilities, with a view to preventing financial crises in the future.

4. Internationalization of the Japanese Yen

For the successful functioning of a currency basket system, and more broadly for regional financial stability, the role of the Japanese yen must be increased. For greater international use of the yen, sufficient incentives must be provided to the private sector in using the yen for international trade, investment, finance, and foreign exchange transactions. A greater role of the yen can in turn induce regional central banks to shift to a currency basket system.

Ideally, the yen would improve its international status and play a regional key currency role in a tri-polar international monetary system. In reality, the international role of the yen has been quite limited. On the contrary, the U.S. dollar continues to play a dominant role as the global key currency, reflecting not only the robust economic performance of the U.S. economy in the 1990s but also the dollar's historical role or inertia. The euro is emerging as a number two international currency.

The U.S. dollar accounts for close to 50 percent of international bonds issued, more than 40 percent of commercial banks' external assets, and 66 percent of foreign reserves held. The dollar is traded in almost 90 percent of foreign exchange transactions in the global market. The euro accounts for about 30 percent of international bonds issued, 27 percent of

commercial banks' external assets, and only 12 percent of foreign exchange reserves. The euro accounts for almost 40 percent of foreign exchange transactions.

In contrast, the yen accounts for less than 10 percent of international bonds issued and commercial banks' external assets, and 5 percent of foreign exchange reserves. The yen is traded in 23 percent of foreign exchange transactions. While the yen's share of Japanese trade with Asia has risen in the second half of the 1990s, there is no doubt that the international status of the yen is still too low to allow a tri-polar monetary system to emerge.

Several steps can be taken to increase the attractiveness of the Japanese yen for international use. The first is to resume strong economic growth in Japan and regain market confidence in its economy, which has been undermined during the past ten years of economic stagnation and price deflation. Priorities should be given to restoring the soundness of the financial system through acceleration of the disposal of non-performing loans, to enhancing total factor productivity growth through structural reform, in particular deregulation, and to ensuring sustainability of the nation's public finance through fiscal consolidation.

Second, further opening and liberalization of the Japanese economy that contributes to larger volumes of its trade with the rest of the world would naturally increase the trade-invoicing role of the yen. Japan's trade as a share of GDP, which is currently one of the lowest among the OECD countries, needs to be increased substantially. In addition, further integration of the Japanese economy with emerging East Asia would encourage intra-industry trade and the associated use of the yen. In manufacturing products, 50 percent of Japan's exports to, and 28 percent of its imports from, Asia are invoiced in the yen, and the yen invoicing ratios are also high for trade with Europe. These shares, though still low compared with those of the United States and Germany, are much higher than those for Japan's overall trade denominated in the yen. Greater manufacturing trade with Asia and Europe will lead to greater use of the yen as a trade invoicing currency.

Third, deeper foreign exchange and capital markets can induce the yen to serve as an attractive investment currency. In the Tokyo foreign exchange market, for instance, direct yen-euro trade comprises only one-fifth of euro-dollar trades in terms of volume. Development of direct transactions between the yen and non-dollar currencies, particularly East Asian currencies, can increase the role of the yen in the foreign exchange market. The recent approval of the Korean authority to allow Japanese banks to trade yen/won in Japan is a step toward this direction. In addition, liquid and deep capital markets can encourage yen-denominated investment and financing, where risks are easily diversified. A number of measures have been taken to improve the efficiency of the capital market in recent years, following the "Financial Big Bang." These attempts include rationalization of stock exchanges, corporatization and eventual listing of the Tokyo Stock Exchanges, introduction of withholding tax exemption for JGB interest payments on non-residents, a review of the syndicate underwriting system for the JGB, and an attempt to shorten the JGB settlement period T+1.

In the foreseeable future, the role of the US dollar will continue to be significant because of the effects of inertia and history. Nonetheless, there still is room for the yen to play a more important role as an international nominal anchor currency in East Asia in the post-crisis era. The yen may come to share the nominal anchor role with the dollar in East Asia, in the sense of receiving greater weights assigned by the East Asian authorities in their currency basket policies.[34]

V. CONCLUDING REMARKS

The recent currency crisis in East Asia created a common trend towards more flexible exchange rates at least as an "official" regime in the affected countries (except for Malaysia). During the crisis, the role of the US dollar as an anchor currency clearly declined in the former crisis countries. As the crisis subsided, East Asia's exchange rate arrangements began to diverge in comparison to the pre-crisis pattern of assigning a considerable weight to the US dollar. Malaysia has restored a US dollar-peg arrangement after a short period of crisis-driven floating, while Indonesia has allowed large fluctuations of the currency. In between these two polar cases, most countries have adopted managed floating. Korea and Thailand particularly appear to have shifted to a *de facto* managed-float, currency-basket arrangement with large weights on the US dollar and the Japanese yen, an arrangement akin to that of Singapore.

The rest of the paper has proposed that emerging economies in East Asia, in the short to medium term, should achieve real effective exchange rate stabilization by loosely tying their central rates to a currency basket, supported by consistent and sustainable macroeconomic policy. It has argued that: (a) a system that ensures intra-regional exchange rate stability will be beneficial for emerging East Asia to promote trade, FDI and economic growth; (b) given the high degree of intra-regional trade and the rising similarity of trade composition in East Asia, each economy's exchange rate policy should be directed towards maintaining intra-regional exchange rate stability; and (c) in view of the sub-optimality of the *de facto* dollar peg policy as an informal and uncoordinated mechanism of ensuring intra-regional stability, a coordinated action can be profitably employed to shift the target of nominal exchange rate stability to a similar currency basket, consisting of the US dollar, the Japanese yen and the euro, which is broadly representative of the region's diversity of trade and FDI structure.

At least initially, regional currency stabilization to the basket does not have to be rigid. Each economy may choose its own formal exchange rate arrangement, provided that a currency basket serves as the reference numeraire in the conduct of exchange rate policy, be it a currency board, a managed float or a basket peg with wide margins. After the initial phase, the East Asian economies may agree on a common basket and adopt policies that

[34] Hence, the yen's role in East Asia will not be as distinct as the one played by the Deutsche mark in the European Monetary System. Even in Western Europe, however, the nominal role of the Deutsche mark appears to have been shared by the French franc and the ECU in recent years (Kawai and Akiyama 1998).

ensure tighter exchange rate stability against the basket. Such an arrangement is likely to contribute to the simultaneous stabilization of intra-regional exchange rates as well as individual economies' effective exchange rates, in a way consistent with the continued medium-term objective of promoting trade, investment and growth in the region. It is a pragmatic policy option for emerging East Asia until greater political and institutional developments create an environment conducive to a more robust framework of monetary and exchange rate cooperation that is commensurate with trade and investment integration in the region. To that end, the regional economies are advised to strengthen financial cooperation through various regional forums, such as ASEAN+3, the Manila Framework Group and EMEAP, and trans-regional fora, such as APEC and ASEM, with a view towards enhanced financing and surveillance mechanisms, which will be supportive of fostering such a framework.

REFERENCES

Alogoskoufis, George and Richard Portes. "The Euro, the Dollar and the International Monetary System." Paul R. Masson, Thomas H. Krueger, and Bart G. Turtleboom, eds., *EMU and the International Monetary System* (Washington, DC: International Monetary Fund, 1997), pp. 58-78.

Bayoumi, Tamim, Barry Eichengreen and Paolo Mauro. "On Regional Monetary Arrangements for ASEAN." *Journal of the Japanese and International Economies*, 14 (June 2000), pp. 121-148.

Bergsten, C. Fred. "The Impact of the Euro on Exchange Rates and International Policy Cooperation." Paul R. Masson, Thomas H. Krueger, and Bart G. Turtleboom, eds., *EMU and the International Monetary System* (Washington, DC: International Monetary Fund, 1997), pp. 17-48.

Braga de Macedo, Jorge, Daniel Cohen and Helmut Reisen. *Don't Fix, Don't Float: The Excahnge Rate in Emerging Markets, Transition Economies and Developing Countries*. Development Centre Studies (2001), Organisation for Economic Co-operation and Development, Paris.

Calvo, Guillermo A. and Carmen M. Reinhart. "Fear of Floating." *Quarterly Journal of Economics*, 117 (2002), pp. 379-408.

Dornbusch, Rudiger and Yung Chul Park. "Flexibility or Nominal Anchors?" Stefan Colligan, Jean Pisani-Ferry and Yung Chul Park, eds., *Exchange Rate Policies in Emerging Asian Countries* (London and New York: Routledge, 1999), pp. 3-34.

Eichengreen, Barry. "The Euro as a Reserve Currency." *Journal of the Japanese and International Economies*, 12 (December 1998), pp. 483-506.

Eichengreen, Barry and Tamim Bayoumi. "Is Asia an Optimum Currency Area? Can It Become One? Regional, Global and Historical Perspectives on Asian Monetary Relations." Stefan Colligan, Jean Pisani-Ferry and Yung Chul Park, eds., *Exchange Rate Policies in Emerging Asian Countries* (London and New York: Routledge, 1999), pp. 347-366.

Eichengreen, Barry and Ricardo Hausmann. "Exchange Rates and Financial Fragility." *NBER Working Paper*, No. 7418 (November 1999), National Bureau of Economic Research, Cambridge.

Fischer, Stanley. "Exchange Rate Regimes: Is the Bipolar View Correct?" *Journal of Economic Perspectives*, 15 (Spring 2001), pp. 3-24.

Frankel, Jeffrey A. "No Single Currency Regime Is Right for All Countries or at All Times." *Essays In International Finance,* No. 215 (August 1999), International Finance Section, Princeton University, Princeton.

Frankel, Jeffrey A., Eduardo Fajnzylber, Sergio Schmukler, and Luis Serven. "Verifying Exchange Rate Regimes." *Policy Research Working Paper*, No. 2397 (May 2000), World Bank, Washington, DC.

Frankel, Jeffrey A. and Andrew K. Rose. "The Endogeneity of the Optimum Currency Area Criteria." *Economic Journal*, 108 (July 1998), pp. 1009-1025.

Frankel, Jeffrey A. and Shang-Jin Wei. "Is There a Currency Bloc in the Pacific?" Adrian Blundell-Wingnall and Stephen Grenville, eds., *Exchange Rates, International Trade and Monetary Policy* (Sydney: Reserve Bank of Australia, 1993), pp. 275-307.

Frankel, Jeffrey A. and Shang-Jin Wei. "Yen Bloc or Dollar Bloc?: Exchange Rate Policies of the East Asian Economies." Takatoshi Ito and Anne Krueger, eds., *Macroeconomic Linkage: Savings, Exchange Rates, and Capital Flows* (Chicago: University of Chicago Press, 1994), pp. 295-329.

Frankel, Jeffrey A. and Shang-Jin Wei. "Emerging Currency Blocks." Hans Genberg, ed., *The International Monetary System*, Spring 1995, pp.111-170.

French and Japanese Staff, Ministries of Finance. "Exchange Rate Regimes for Emerging Market Economies." Discussion Paper (January 14, 2001), Paris and Tokyo.

Fukuda, Shinichi. "Post-crisis Exchange Rate Regimes in East Asia." Mimeographed (February 2002), Faculty of Economics, University of Tokyo, Tokyo.

Goldstein, Morris. "Managed Floating Plus." *Policy Analyses in International Economics*, No. 66 (March 2002), Institute for International Economics, Washington, DC.

Goto, Junichi and Koichi Hamada. "Economic Preconditions for Asian Regional Integration." Takatoshi Ito and Anne O. Krueger, eds., *Macroeconomic Linkage: Savings, Exchange Rates, and Capital Flows* (Chicago: University of Chicago Press, 1994), pp. 359-385.

Hamada, Koichi and Akiyoshi Horiuchi. "Monetary, Financial and Real Effects of Yen Internationalization." S. W. Arndt and J. D. Richardson, eds., *Real-Financial Linkages among Open Economies* (Cambridge: MIT Press, 1987), pp. 167-191.

Hausmann, Rocardo. "The Dollarization Debate: Is It Over?" A paper presented to the international conference on "Monetary outlook on East Asia in an Integrating World Economy" (September 5-6, 2001), Chulalongkorn University, Bangkok

Hausmann, Ricardo, Ugo Panizza and Ernesto Stein. "Why Do Countries Float the Way They Float?" Mimeographed (November 1999), Inter-American Development Bank, Washington, DC.

Hernandez, Leonard and Peter Montiel. "Post-Crisis Exchange Rate Policy in Five Asian Countries: Filling in the 'Hollow Middle'?" *IMF Working Paper*, WP/01/170 (November 2001), International Monetary Fund, Washington, DC.

Honohan, Patrick and Philip R. Lane. "Pegging to the Dollar and the Euro." *International Finance*, 2:3 (1999), pp. 379-410.

International Monetary Fund. *World Economic Outlook* (1997). International Monetary Fund, Washington, DC.

Ito, Takatoshi. "The Role of the Yen in East Asia." A paper presented to the international conference on "Monetary Outlook on East Asia in an Integrating World Economy" (September 5-6, 2001), Chulalongkorn University, Bangkok.

Ito, Takatoshi, Eiji Ogawa, and Yuri Nagataki-Sasaki. "How Did the Dollar Peg Fail in Asia?" *Journal of the Japanese and International Economies*, 12 (December 1998), pp. 256-304.

Kawai, Masahiro. "The Japanese Yen as an International Currency: Performance and Prospects." Ryuzo Sato, Rama V. Ramachandran, and Hajime Hori, eds., *Organization, Performance and Equity: Perspectives on the Japanese Economy* (Kluwer Academic Publishers, 1996), pp. 305-355.

Kawai, Masahiro. "Japan's Trade and Investment in East Asia." David Robertson, ed., *East Asian Trade after the Uruguay Round* (Cambridge: Cambridge University Press, 1997), pp. 209-226.

Kawai, Masahiro and Shigeru Akiyama. "Roles of the World's Major Currencies in Exchange Rate Arrangements." *Journal of the Japanese and International Economies*, 12 (December 1998), pp. 334-387.

Kawai, Masahiro and Shigeru Akiyama. "Implications of Currency Crisis for Exchange rate Arrangements in Emerging East Asia." *Policy Research Working Paper*, No. 2502 (December 2000), World Bank, Washington, DC.

Kawai, Masahiro and Shinji Takagi. "Proposed Strategy for a regional Exchange Rate Arrangement in Post-crisis East Asia: Analysis, Review and Proposal." *Policy Research Working Paper*, No. 2503 (December 2000), World Bank, Washington, DC.

Kuroda, Haruhiko and Masahiro Kawai. "Strengthening Regional Financial Cooperation in East Asia." A paper presented to the Seminar on "Regional Economic, Financial and

Monetary Co-operation: The European and Asian Experiences" (April 15-16, 2002), European Central Bank, Frankfurt am Main.

Kwan, C. H. *Yen Bloc: Toward Economic Integration in Asia* (Washington, DC: Brookings Institution, 2001).

McCauley, Robert N. "Setting Monetary Policy in East Asia: Goals, Developments and Institutions." David Gruen and John Simon, eds., *Future Directions for Monetary Policies in East Asia* (Sydney: Reserve Bank of Australia, 2001), pp. 6-55.

McKinnon, Ronald I. "The East Asian Dollar Standard: Life after Death?" *Economic Notes*, 29 (February 2000), pp. 31-82.

McKinnon, Ronald I. "After the Crisis, the East Asian Dollar Standard Resurrected." A paper presented to the international conference on "Monetary Outlook on East Asia in an Integrating World Economy" (September 5-6, 2001), Chulalongkorn University, Bangkok.

McKinnon, Ronald I. and Kenichi Ohno. *Dollar and Yen: Resolving Economic Conflict between the United States and Japan* (Cambridge, MA: MIT Press, 1997).

McKinnon, Ronald I. and Gunther Schnabl. "Synchronized Business Cycles in East Asia: Fluctuations in the Yen/Dollar Exchange Rate and China's Stabilizing Role." Mimeographed (June 2002), Stanford University, Stanford.

Mundell, Robert. "Currency Area Formation and the Asian Region." A paper presented to the international conference on "Monetary Outlook on East Asia in an Integrating World Economy" (September 5-6, 2001), Chulalongkorn University, Bangkok

Mussa, Michael, Paul Masson, Alexander Swoboda, Esteban Jadresic, Paolo Mauro, and Andy Berg. "Exchange Rate Regimes in an Increasingly Integrated World Economy." *Occasional Paper*, 193 (August 2000), International Monetary Fund, Washington, DC.

Obstfeld, Maurice and Kenneth Rogoff. "The Mirage of Fixed Exchange Rates." *Journal of Economic Perspectives*, 9 (Fall 1995), pp. 73-96.

Ogawa, Eiji and Takatoshi Ito. "On the Desirability of a Regional Basket Currency Arrangement." *NBER Working Paper*, No. 8002 (November 2000), National Bureau of Economic Research, Cambridge.

Ohno, Kenichi. "Exchange Rate Management in Developing Asia: Reassessment of the Pre-crisis Soft Dollar Zone." *ADBI Working Paper*, 1 (January 1999), Asian Development Bank Institute, Tokyo.

Rogoff, Kenneth. "Why Not a Global Currency?" *American Economic Review Proceedings*, 91 (May 2001), pp. 243-247.

Sakakibara, Eisuke and Sharon Smith Yamakawa. “Regional Integration in East Asia: Challenges and Opportunities.” Mimeographed (December 2001), Global Security Research Center, Keio University, Tokyo.

Takagi, Shinji. “A Basket Peg Policy: Operational Issues for Developing Countries.” *World Development*, 16 (February 1988), pp. 271-279.

Takagi, Shinji. “The Yen and Its East Asian Neighbors, 1980-1995.” Takatoshi Ito and Anne O. Krueger, eds., *Changes in Exchange Rates in Rapidly Developing Countries: Theory, Practice, and Policy Issues* (Chicago: University of Chicago Press, 1999), pp. 185-207.

Tavlas, George S. and Yuzuru Ozeki. “The Internationalization of Currencies: An Appraisal of the Japanese Yen.” *Occasional Paper*, 90 (January 1992), International Monetary Fund, Washington, DC.

Williamson, John. “The Case for a Common Basket Peg for East Asian Currencies.” Stefan Collignon, Jean Pisani-Ferry and Yung Chul Park, eds., *Exchange Rate Policies in Emerging Asian Countries* (London and New York: Routledge, 1999a), pp. 327-343.

Williamson, John. “Future Exchange Rate Regimes for Developing East Asia: Exploring the Policy Options.” A paper presented to the conference on “Asia in Economic Recovery: Policy Options for Growth and Stability” (June 21-22, 1999b), Institute of Policy Studies, Singapore.

Williamson, John. “Exchange Rate Regimes for Emerging Markets: Reviving the Intermediate Option.” *Policy Analyses in International Economics*, 60 (2000), Institute for International Economics, Washington, DC.

Williamson, John. “The Case for a Basket, Band and Crawl (BBC) Regime for East Asia.” David Gruen and John Simon, eds., *Future Directions for Monetary Policies in East Asia* (Sydney: Reserve Bank of Australia, 2001), pp. 96-111.

Wyplosz, Charles. “A Monetary Union in Asia? Some European Lessons.” David Gruen and John Simon, eds., *Future Directions for Monetary Policies in East Asia* (Sydney: Reserve Bank of Australia, 2001), pp. 124-155.

Table 1. Summary of Official Exchange Rate Arrangements of IMF-member Developing Countries 1980-2001

	Dec. 1980	Dec. 1985	Dec. 1990	Dec. 1991	Dec. 1992	Dec. 1993	Dec. 1994	Dec. 1995	Dec. 1996	Dec. 1997	Sept. 1998	Jan. 1999	Dec. 1999	Dec. 2000	Dec. 2001
Fixed exchange rate arrangement	**90**	**89**	**81**	**75**	**82**	**71**	**70**	**65**	**65**	**65**	**63**	**73**	**79**	**79**	**76**
Pegged to the US dollar	39	31	25	24	24	21	23	22	21	20	20	31	38	37	38
Pegged to the Euro	15	14	15	15	15	16	16	17	17	19	20	21	21	22	21
Pegged to the French franc	14	14	14	14	14	14	14	14	14	15	15	15	15	15	15
Pegged to the Deutsche mark	0	0	1	1	1	1	1	2	2	3	3	4	4	5	4
Pegged to other EMU currency	1	0	0	0	0	1	1	1	1	1	2	2	2	2	2
Pegged to the UK pound sterling	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Pegged to the Russian ruble	0	0	0	0	6	1	1	0	0	0	0	0	0	0	0
Pegged to other currency	2	4	5	3	5	5	6	5	6	7	7	7	7	7	7
Pegged to SDR	15	11	6	6	5	4	4	3	2	3	4	2	2	2	1
Pegged to other currency composite	18	28	30	27	27	24	20	18	19	16	12	12	11	11	9
Limited exchange rate flexibility	**a**	**5**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**9**	**3**	**4**	**4**
More flexible exchange rate arrangement	**3+b+c**	**32**	**46**	**54**	**58**	**77**	**81**	**88**	**89**	**89**	**92**	**80**	**80**	**80**	**83**
Adjusted according to a set of indicators	3	4	5	5	3	4	3	2	2	--	--	--	--	--	--
Other managed floating	b	17	21	25	22	28	30	42	43	44	55	41	37	42	52
Independently floating	c	11	20	24	33	45	48	44	44	45	37	39	43	38	31
Unclassified	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0
Total	**118**	**127**	**132**	**134**	**144**	**152**	**155**	**157**	**158**	**158**	**159**	**162**	**162**	**163**	**163**

Notes: (1) Several IMF-member and non-member developing economies are not always included in this table, e.g., Hong Kong (1980-1998), Taiwan, and Cambodia (1980 and 1992).

(2) The sum of a, b, and c in the table in 1980 is 25.

(3) A new classification of exchange rate arrangements was introduced, starting from January 1, 1999. To try to maintain consistency with the earlier classification, several assumptions are made: a **"fixed exchange rate arrangement"** includes "exchange arrangements with no separate legal tender," "currency board arrangements" and "other conventional fixed peg arrangements (including *de facto* peg arrangements under managed floating)"; "**limited exchange rate flexibility"** corresponds to "pegged exchange rates within horizontal bands"; **"managed floating"** includes "crawling pegs," "exchange rates within crawling bands" and "managed floating with no preannounced path for exchange rate"; and **"independently floating"** in the table corresponds to "independently floating" under the new classification.

(4) The number of countries under "fixed exchange rate arrangement" jumped upwards in January 1999 because 9 countries began to be reclassified as under "other conventional fixed peg arrangements (including *de facto* peg arrangements under managed floating)" rather than as managed or independently floating, and 3 economies (Aruba, Hong Kong, and Netherlands Antilles) were newly added to the list.

Sources: IMF, International Financial Statistics, various issues.

Table 2-A. Summary of Observed Exchange Rate Arrangements of Developing Countries, 1980.01-1984.12

(a) Pegged: 0 < Volatility < 0.0075; Number of Countries = 83

USD (39)	Volatility	Excl/Incl	Other Single Currency (23)	Volatility	Excl/Incl	Basket of Currencies (21)	Volatility	Excl/Incl
Angola #	0.0000	0/60	Benin (FF#)	0.0000	0/60	Sao Tome and Principe (SDR#)	0.0000	0/60
Antigua and Barbuda #	0.0000	0/60	Bhutan (IR#)	0.0000	0/60	Guinea (SDR#)	0.0000	0/60
Bahamas, The #	0.0000	0/60	Brunei (SID#)	0.0000	0/60	Qatar (USD#,UKP)	0.0012	0/60
Barbados #	0.0000	0/60	Burkina Faso (FF#)	0.0000	0/60	United Arab Emirates (USD#,UKP)	0.0014	0/60
Belize #	0.0000	0/60	Cameroon (FF#)	0.0000	0/60	Mozambique (USD,SDR,DM,PE,UKP)	0.0021	0/60
Djibouti #	0.0000	0/60	Central African Republic (FF#)	0.0000	0/60	Saudi Arabia (USD#,UKP)	0.0023	0/60
Dominica #	0.0000	0/60	Chad (FF#)	0.0000	0/60	Kuwait (USD#,UKP,JY)	0.0030	0/60
Dominican Republic #	0.0000	0/60	Comoros (FF#)	0.0000	0/60	Fiji (USD,UKP,SID,AD,NZD,JY)	0.0036	0/60
Egypt, Arab Rep. #	0.0000	0/60	Congo, Rep. (FF#)	0.0000	0/60	Jordan (SDR,USD,FF)	0.0041	0/60
El Salvador #	0.0000	0/60	Cote d'Ivoire (FF#)	0.0000	0/60	Indonesia (USD#,UKP)	0.0041	1/59
Ethiopia #	0.0000	0/60	Equatorial Guinea (SP#)	0.0000	2/58	Cyprus (ECU,UKP,USD,FF)	0.0045	0/60
Grenada #	0.0000	0/60	Gabon (FF#)	0.0000	0/60	Iran, Islamic Rep. (USD,ECU,JY)	0.0046	0/60
Guatemala #	0.0000	0/60	Kiribati (AD#)	0.0000	0/60	Myanmar (SDR,USD)	0.0047	0/60
Haiti #	0.0000	0/60	Mali (FF#)	0.0000	0/60	Algeria (USD,FF)	0.0047	0/60
Honduras #	0.0000	0/60	Namibia (SAR#)	0.0000	1/59	Singapore (USD,JY)	0.0060	0/60
Lao PDR #	0.0000	2/58	Niger (FF#)	0.0000	0/60	Sierra Leone (SDR#,USD)	0.0060	1/59
Liberia #	0.0000	0/60	San Marino (ITL#)	0.0000	0/60	India (USD,UKP,FF)	0.0061	0/60
Micronesia, Fed. Sts. #	0.0000	0/60	Senegal (FF#)	0.0000	0/60	Mauritius (USD,DM,UKP,SAR,JY)	0.0062	1/59
Netherlands Antilles #	0.0000	0/60	Togo (FF#)	0.0000	0/60	Malta (USD,ECU,UKP)	0.0064	0/60
Panama #	0.0000	0/60	Tonga (AD#)	0.0000	0/60	Cape Verde (FF,PE,USD,UKP)	0.0066	0/60
Paraguay #	0.0000	2/58	Lesotho (SAR#)	0.0001	1/59	Malaysia (SID#,USD)	0.0069	0/60
St. Kitts and Nevis #	0.0000	0/60	Gambia, The (UKP#)	0.0002	1/59			
St. Lucia #	0.0000	0/60	Swaziland (SAR#)	0.0011	1/59			
St. Vincent and the Grenadines #	0.0000	0/60						
Sudan #	0.0000	4/56						
Suriname #	0.0000	0/60						
Syrian Arab Republic #	0.0000	0/60						
Trinidad and Tobago #	0.0000	0/60						
Libya #	0.0000	0/60						
Oman #	0.0000	0/60						
Nicaragua #	0.0002	0/60						
Venezuela #	0.0002	2/58						
Bahrain #	0.0003	0/60						
Bolivia #	0.0016	12/48						
Colombia #	0.0042	0/60						
Iraq #	0.0047	0/60						
Taiwan #	0.0060	0/60						
Afghanistan #	0.0067	0/60						
Rwanda #	0.0073	0/60						

(b) Intermediate: 0.0075 < Volatility < 0.015; Number of Countries = 25

USD (10)	Volatility	Excl/Incl	Other Single Currency (0)	Volatility	Excl/Incl	Basket of Currencies (15)	Volatility	Excl/Incl
Korea, Rep. #	0.0084	1/59				Maldives (USD#,DM)	0.0083	0/60
Guyana #	0.0088	3/57				Thailand (USD#,UKP)	0.0084	1/59
Ghana #	0.0103	4/56				Samoa (NZD,AD)	0.0094	2/58
Tanzania #	0.0112	4/56				Nepal (USD,IR)	0.0099	0/60
Burundi #	0.0117	1/59				Vanuatu (SDR,DM)	0.0101	0/60
Somalia #	0.0122	3/57				Tunisia (FF#,USD)	0.0105	0/60
Mexico #	0.0126	7/53				Pakistan (USD#,JY)	0.0117	0/60
Philippines #	0.0137	2/58				Botswana (SAR,USD)	0.0120	1/59
Mauritania #	0.0138	0/60				Seychelles (USD,DM)	0.0123	0/60
Ecuador #	0.0148	3/57				Morocco (ECU#,USD)	0.0125	0/60
						Solomon Islands (AD,USD,JY)	0.0128	0/60
						Sri Lanka (SDR,USD)	0.0129	0/60
						China (SDR#)	0.0129	0/60
						Guinea-Bissau (USD,JY)	0.0142	3/57
						Israel (USD#,FF)	0.0146	17/43

(c) Flexible: Volatility > 0.015; Number of Countries = 24

USD (12)	Volatility	Excl/Incl	Other Single Currency (1)	Volatility	Excl/Incl	Basket of Currencies (10)	Volatility	Excl/Incl
Jamaica #	0.0159	3/57	Papua New Guinea (AD#)	0.0170	0/60	Zimbabwe (USD,SAR,UKP)	0.0150	1/59
Costa Rica #	0.0162	4/56				Nigeria (SDR#,UKP)	0.0150	0/60
Hungary #	0.0177	0/60				Bangladesh (SDR#)	0.0150	0/60
Congo, Dem. Rep.	0.0181	6/54				Romania (USD,DM,UKP)	0.0152	3/57
Hong Kong #	0.0195	0/60				Zambia (USD,SAR)	0.0156	1/59
Brazil #	0.0204	9/51				Malawi (USD,SAR)	0.0160	0/60
Peru #	0.0210	3/57				Turkey (USD,FF)	0.0165	2/58
Chile #	0.0229	3/57				South Africa (UKP,USD,JY)	0.0183	1/59
Uruguay #	0.0232	2/58				Kenya (SDR#,UKP)	0.0200	0/60
Poland	0.0233	1/58				Madagascar (SDR)	0.0204	1/59
Uganda	0.0291	7/53						
Argentina #	0.0365	30/30						

Note: 1) Total number of countries is 132.

2) Countries are classified into three categories of exchange rate arrangements (pegged, intermediate, and flexible), depending on the size of exchange rate volatility as measured by the standard error of regression. Countries are classified as "pegged" when the volatility is less than 0.005, "intermediate" when the volatility is between 0.0075 and 0.015, and "flexible" when the volatility is greater than 0.015. The size of exchange rate volatility is shown next to each country7s name. In each category, countries are further classified into three groups, depending on what currency or basket of currencies is assigned a significant weight in the regression equation. Countries in the "USD" group are those for which the US dollar appears as the only significant currency in the regression equation. Countries in the "other single currency" group are those for which other single currency appears as the only significant currency in the regression equation, with the name of the currency shown in each parenthesis. Countries in the "basket of currencies" group are those for which multiple currencies appear as significant in the regression equation, with the names of currencies shown in each parenthesis. The pound sign "#" is attached to a currency if its estimated coefficient exceeds 0.80 on an adjusted basis; when the sum of the estimated coefficients on multiple currencies is greater than unity, adjustment is made by proportionally re-scaling the estimated coefficients downward so as to make the sum of the adjusted coefficients equal to one.

3) Data observations with values of log first differences greater than 0.1 have been excluded. The column, excl/incl, shows the number of observations excluded from and includedin the regression equation.

4) The currency names are abbreviated as: USD = US dollar, FF = French franc, SAR = South African rand, SID = Singapore dollar, DM = Deutsche mark, AD = Australian dollar,JY = Japanese yen, UKP = UK pound, NZD = New Zealand dollar, SDR = Special drawing rights, ECU = European currency unit.

5) There is no currency weight for Lebanon, with the volatility of 0.0319 and Excl/Incl being 3/57.

Table 2-B. Summary of Observed Exchange Rate Arrangements of Developing Countries, 1985.01-1989.12

(a) Pegged: 0 < Volatility < 0.0075; Number of Countries = 69

USD (32)	Volatility	Excl/Incl	Other Single Currency (22)	Volatility	Excl/Incl	Basket of Currencies (15)	Volatility	Excl/Incl
Afghanistan #	0.0000	0/60	Benin (FF#)	0.0000	0/60	Hong Kong (USD#,ECU)	0.0014	0/60
Angola #	0.0000	0/60	Bhutan (IR#)	0.0000	0/60	Myanmar (SDR#)	0.0020	0/60
Antigua and Barbuda #	0.0000	0/60	Brunei (SID#)	0.0000	0/60	Seychelles (SDR#)	0.0021	0/60
Aruba #	0.0000	0/47	Burkina Faso (FF#)	0.0000	0/60	Malta (SDR,DM,UKP,USD)	0.0022	0/60
Bahamas, The #	0.0000	0/60	Cameroon (FF#)	0.0000	0/60	Iran, Islamic Rep. (SDR#)	0.0022	0/60
Bahrain #	0.0000	0/60	Central African Republic (FF#)	0.0000	0/60	Thailand (USD,SID,UKP)	0.0036	0/60
Barbados #	0.0000	0/60	Chad (FF#)	0.0000	0/60	Mauritius (SDR,DM)	0.0049	0/60
Belize #	0.0000	0/60	Congo, Rep. (FF#)	0.0000	0/60	Cape Verde (PE,USD)	0.0054	0/60
Djibouti #	0.0000	0/60	Cote d'Ivoire (FF#)	0.0000	0/60	Rwanda (SDR#)	0.0057	0/60
Dominica #	0.0000	0/60	Equatorial Guinea (FF#)	0.0000	1/59	Samoa (USD,NZD,JY,AD)	0.0063	0/60
Egypt, Arab Rep. #	0.0000	1/59	Gabon (FF#)	0.0000	0/60	Kuwait (USD,FF,JY)	0.0066	0/60
El Salvador #	0.0000	2/58	Kiribati (AD#)	0.0000	0/60	Fiji (USD,FF,AD,JY,UKP,NZD)	0.0067	2/58
Ethiopia #	0.0000	0/60	Lesotho (SAR#)	0.0000	6/54	Pakistan (USD,IR)	0.0069	0/60
Grenada #	0.0000	0/60	Mali (FF#)	0.0000	0/60	Libya (SDR#)	0.0075	0/60
Haiti #	0.0000	0/60	Namibia (SAR#)	0.0000	6/54	Cyprus (FF,USD,UKP)	0.0075	0/60
Honduras #	0.0000	0/60	Niger (FF#)	0.0000	0/60			
Iraq #	0.0000	0/60	San Marino (ITL#)	0.0000	0/60			
Liberia #	0.0000	0/60	Senegal (FF#)	0.0000	0/60			
Micronesia, Fed. Sts. #	0.0000	0/60	Togo (FF#)	0.0000	0/60			
Panama #	0.0000	0/60	Comoros (FF#)	0.0000	0/60			
Qatar #	0.0000	0/60	Tonga (AD#)	0.0014	0/60			
St. Kitts and Nevis #	0.0000	0/60	Swaziland (SAR#)	0.0050	7/53			
St. Lucia #	0.0000	0/60						
St. Vincent and the Grenadines #	0.0000	0/60						
Suriname #	0.0000	0/60						
Syrian Arab Republic #	0.0000	1/59						
United Arab Emirates #	0.0000	0/60						
Netherlands Antilles #	0.0007	0/60						
Indonesia #	0.0030	2/58						
Saudi Arabia #	0.0038	0/60						
Sudan #	0.0047	2/58						
Costa Rica #	0.0065	0/60						

(b) Intermediate: 0.0075 < Volatility < 0.015; Number of Countries = 29

USD (14)	Volatility	Excl/Incl	Other Single Currency (1)	Volatility	Excl/Incl	Basket of Currencies (14)	Volatility	Excl/Incl
Bangladesh #	0.0075	0/60	Nepal (IR#)	0.0091	1/59	India (USD,UKP)	0.0077	0/60
Colombia #	0.0076	0/60				Morocco (USD,SP)	0.0077	0/60
China #	0.0079	2/58				Botswana (SAR,USD)	0.0087	4/56
Korea, Rep. #	0.0080	0/60				Kenya (USD,ECU,JY)	0.0089	0/60
Singapore #	0.0085	0/60				Mauritania (USD,SP)	0.0090	1/59
Guyana #	0.0087	3/57				Malaysia (USD,SID)	0.0091	0/60
Sri Lanka #	0.0122	0/60				Algeria (SDR#)	0.0098	0/60
Philippines #	0.0124	0/60				Oman (USD#,UKP)	0.0106	0/60
Guinea	0.0125	4/56				Solomon Islands (SID,JY,AD)	0.0115	0/60
Taiwan #	0.0128	0/60				Papua New Guinea (AD,USD)	0.0122	0/60
Guatemala #	0.0132	2/58				Zimbabwe (USD,SAR,UKP)	0.0131	0/60
Venezuela #	0.0147	2/58				Madagascar (FF,USD)	0.0132	3/57
Mozambique #	0.0149	4/56				Sao Tome and Principe (USD,JY)	0.0136	5/55
Vietnam #	0.0149	8/44				Tunisia (FF,UKP,USD)	0.0144	0/60

(c) Flexible: Volatility > 0.015; Number of Countries = 36

USD (24)	Volatility	Excl/Incl	Other Single Currency (2)	Volatility	Excl/Incl	Basket of Currencies (10)	Volatility	Excl/Incl
Trinidad and Tobago #	0.0153	2/58	Gambia, The (UKP#)	0.0192	3/57	Paraguay (USD#,JY)	0.0162	3/57
Uruguay #	0.0161	2/58	Zambia (IR#)	0.0334	11/49	Vanuatu (SDR#)	0.0169	1/59
Bolivia #	0.0165	8/52				Chile (USD#,JY)	0.0186	0/60
Turkey	0.0168	0/60				Jordan (SDR#)	0.0205	1/59
Hungary	0.0175	0/60				Burundi (SDR#)	0.0227	0/60
Maldives #	0.0181	1/59				Peru (USD,JY)	0.0248	22/38
Romania	0.0195	0/60				Malawi (SDR#)	0.0269	2/58
Ghana #	0.0196	4/56				Argentina (USD,JY)	0.0272	25/35
Congo, Dem. Rep.	0.0200	6/54				South Africa (SDR#)	0.0274	6/54
Israel	0.0210	5/55				Somalia (SDR#)	0.0278	15/45
Lao PDR #	0.0219	4/56						
Tanzania #	0.0224	7/53						
Jamaica #	0.0224	0/60						
Nicaragua #	0.0228	20/40						
Poland	0.0228	13/47						
Guinea-Bissau	0.0229	6/54						
Ecuador #	0.0233	5/55						
Uganda #	0.0247	9/51						
Dominican Republic #	0.0272	5/55						
Mexico #	0.0276	2/58						
Sierra Leone	0.0319	12/48						
Nigeria #	0.0321	6/54						
Brazil #	0.0361	38/22						
Lebanon #	0.0488	24/36						

Note: 1) Total number of countries is 134.
2-4) Same as in Table 2-A.

Table 2-C. Summary of Observed Exchange Rate Arrangements of Developing Countries, 1990.01-1994.12

(a) Pegged: 0 < Volatility < 0.0075; Number of Countries = 67

USD (31)	Volatility	Excl/Incl	Other Single Currency (22)	Volatility	Excl/Incl	Basket of Currencies (14)	Volatility	Excl/Incl
Afghanistan #	0.0000	1/59	Brunei (SID#)	0.0000	0/60	Thailand (USD#,SDR,JY)	0.0006	0/60
Antigua and Barbuda #	0.0000	0/60	Equatorial Guinea (FF#)	0.0000	1/59	Turkmenistan (USD,UKP,RR)	0.0014	3/10
Aruba #	0.0000	0/60	Kiribati (AD#)	0.0000	0/60	Czech Republic (DM,USD)	0.0020	0/23
Bahamas, The #	0.0000	0/60	Lesotho (SAR#)	0.0000	0/60	Indonesia (USD#,SDR)	0.0024	0/60
Bahrain #	0.0000	0/60	Namibia (SAR#)	0.0000	0/60	Lao PDR (USD,THB)	0.0030	0/60
Barbados #	0.0000	0/60	San Marino (ITL#)	0.0000	1/59	Fiji (USD,AD,UKP,JY,NZD)	0.0031	0/60
Belize #	0.0000	0/60	Swaziland (SAR#)	0.0000	0/60	Jordan (USD#,ECU,JY)	0.0045	0/60
Djibouti #	0.0000	0/60	Benin (FF#)	0.0000	1/59	Singapore (SDR,USD)	0.0052	0/60
Dominica #	0.0000	0/60	Burkina Faso (FF#)	0.0000	1/59	Tonga (AD,USD,NZD)	0.0053	0/60
Grenada #	0.0000	0/60	Cameroon (FF#)	0.0000	1/59	Mauritius (ECU,SDR)	0.0058	0/60
Iraq #	0.0000	0/60	Central African Republic (FF#)	0.0000	1/59	Cyprus (ECU#,SDR)	0.0063	0/60
Liberia #	0.0000	0/60	Chad (FF#)	0.0000	1/59	Tunisia (DM,ITL,USD)	0.0066	0/60
Micronesia, Fed. Sts. #	0.0000	0/60	Comoros (FF#)	0.0000	1/59	Moldova (SDR#)	0.0071	0/7
Netherlands Antilles #	0.0000	0/60	Congo, Rep. (FF#)	0.0000	1/59	Cape Verde (FF,PE)	0.0073	1/59
Oman #	0.0000	0/60	Cote d'Ivoire (FF#)	0.0000	1/59			
Panama #	0.0000	0/60	Gabon (FF#)	0.0000	1/59			
Qatar #	0.0000	0/60	Mali (FF#)	0.0000	1/59			
Saudi Arabia #	0.0000	0/60	Niger (FF#)	0.0000	1/59			
St. Kitts and Nevis #	0.0000	0/60	Senegal (FF#)	0.0000	1/59			
St. Lucia #	0.0000	0/60	Togo (FF#)	0.0000	1/59			
St. Vincent and the Grenadines #	0.0000	0/60	Bhutan (IR#)	0.0002	2/58			
Syrian Arab Republic #	0.0000	0/60	Estonia (DM#)	0.0039	0/30			
United Arab Emirates #	0.0000	0/60						
Yemen, Rep. #	0.0000	0/55						
Hong Kong #	0.0013	0/60						
Suriname #	0.0022	4/56						
Bolivia #	0.0035	0/60						
Egypt, Arab Rep. #	0.0040	2/58						
Trinidad and Tobago #	0.0043	1/59						
Korea, Rep. #	0.0048	0/60						
Bangladesh #	0.0075	0/60						

(b) Intermediate: 0.0075 < Volatility < 0.015; Number of Countries = 34

USD (10)	Volatility	Excl/Incl	Other Single Currency (1)	Volatility	Excl/Incl	Basket of Currencies (23)	Volatility	Excl/Incl
India #	0.0085	2/58	Slovak Republic (FF#)	0.0124	0/23	Seychelles (SDR#)	0.0076	0/60
Colombia #	0.0087	1/59				Taiwan (USD#,FF)	0.0078	0/60
Mexico #	0.0093	1/59				El Salvador (USD#,UKP)	0.0081	2/58
China #	0.0107	2/58				Pakistan (USD,FF,IR)	0.0082	0/60
Costa Rica #	0.0127	0/60				Kuwait (USD#,JY)	0.0084	0/51
Mongolia #	0.0136	5/48				Libya (USD,FF,JY,UKP)	0.0092	1/59
Paraguay #	0.0138	0/60				South Africa (USD,FF,UKP)	0.0097	0/60
Guinea #	0.0140	0/60				Botswana (SAR#,USD)	0.0098	2/58
Ethiopia #	0.0141	1/59				Vanuatu (AD,USD)	0.0103	0/60
Chile #	0.0146	0/60				Myanmar (ECU,USD,JY)	0.0105	0/60
						Iran, Islamic Rep. (SDR#)	0.0106	2/58
						Malta (FF,ITL,USD)	0.0108	0/60
						Solomon Islands (USD#,JY)	0.0109	0/60
						Malaysia (USD#,DM)	0.0111	0/60
						Israel (SDR#)	0.0116	0/60
						Morocco (FF#,USD)	0.0126	0/60
						Hungary (USD,ECU)	0.0129	1/59
						Burundi (SDR#)	0.0133	1/59
						Samoa (SID,AD)	0.0133	0/60
						Madagascar (ECU,USD)	0.0140	2/58
						Mauritania (SP,USD)	0.0144	1/59
						Argentina (USD,DM)	0.0144	6/54
						Guyana (USD,DM)	0.0149	4/56

(c) Flexible: Volatility > 0.015; Number of Countries = 53

USD (29)	Volatility	Excl/Incl	Other Single Currency (7)	Volatility	Excl/Incl	Basket of Currencies (17)	Volatility	Excl/Incl
Maldives #	0.0154	0/60	Latvia (JY)	0.0202	5/29	Gambia, The (FF,JY,UKP)	0.0156	0/60
Somalia #	0.0156	0/5	Macedonia, FYR (DM#)	0.0224	0/12	Nepal (USD,IR)	0.0165	0/60
Sri Lanka #	0.0165	0/60	Croatia (FF#)	0.0234	10/14	Papua New Guinea (USD,AD)	0.0166	1/59
Poland	0.0167	3/57	Slovenia (DM#)	0.0236	1/36	Nicaragua (USD,DM)	0.0168	16/44
Algeria	0.0168	6/54	Armenia (RR)	0.0309	21/9	Turkey (SDR#)	0.0177	4/56
Uruguay #	0.0174	0/60	Cambodia (SID#)	0.0329	12/23	Malawi (SAR,UKP,JY)	0.0180	7/53
Honduras #	0.0178	4/56	Brazil (FF#)	0.0517	46/14	Ghana (USD,ITL)	0.0196	0/60
Dominican Republic #	0.0179	3/57				Rwanda (SDR#)	0.0197	5/50
Kazakhstan #	0.0183	7/6				Sao Tome and Principe (ECU#,USD)	0.0205	6/52
Vietnam #	0.0185	2/58				Kenya (SDR#)	0.0213	4/56
Philippines #	0.0193	0/60				Guatemala (USD,ECU,JY)	0.0220	2/58
Venezuela #	0.0194	2/58				Mozambique (SDR#)	0.0238	7/53
Ecuador #	0.0194	1/59				Sudan (USD,ITL)	0.0246	6/54
Tanzania #	0.0213	2/58				Tajikistan (UKP#,RR)	0.0297	15/15
Zimbabwe	0.0214	3/57				Lithuania (USD#,RR)	0.0315	3/21
Sierra Leone #	0.0217	6/54				Romania (USD,ITL)	0.0334	12/48
Lebanon #	0.0241	16/44				Angola (SDR#)	0.0400	32/28
Albania	0.0243	2/33						
Ukraine #	0.0245	14/10						
Guinea-Bissau #	0.0260	3/57						
Peru #	0.0262	16/44						
Haiti #	0.0274	4/56						
Uganda #	0.0309	2/58						
Nigeria #	0.0312	3/57						
Jamaica #	0.0331	3/57						
Bulgaria #	0.0332	8/40						
Zambia #	0.0345	15/45						
Congo, Dem. Rep. #	0.0376	44/16						
Russian Federation #	0.0378	14/16						

Note: 1) Total number of countries is 154.
2-4) Same as in Table 2-A.

Table 2-D. Summary of Observed Exchange Rate Arrangements of Developing Countries, 1995.01-1999.12

(a) Pegged: 0 < Volatility < 0.0075; Number of Countries = 75

USD (37)	Volatility	Excl/Incl	Other Single Currency (24)	Volatility	Excl/Incl	Basket of Currencies (14)	Volatility	Excl/Incl
Afghanistan #	0.0000	2/58	Benin (FF#)	0.0000	0/60	Morocco (FF,DM,USD,UKP,SP)	0.0015	0/60
Antigua and Barbuda #	0.0000	0/60	Bhutan (IR#)	0.0000	0/60	Latvia (SDR#)	0.0015	0/60
Aruba #	0.0000	0/60	Brunei (SID#)	0.0000	0/60	Cyprus (FF,DM,UKP,ITL)	0.0025	0/60
Bahamas, The #	0.0000	0/60	Burkina Faso (FF#)	0.0000	0/60	Myanmar (SDR#)	0.0025	0/60
Bahrain #	0.0000	0/60	Cameroon (FF#)	0.0000	0/60	Fiji (USD,NZD,AD,UKP,JY)	0.0025	1/59
Barbados #	0.0000	0/60	Central African Republic (FF#)	0.0000	0/60	Kuwait (USD#,UKP,JY)	0.0027	0/60
Belize #	0.0000	0/60	Chad (FF#)	0.0000	0/60	Libya (SDR#)	0.0030	1/59
Djibouti #	0.0000	0/60	Congo, Rep. (FF#)	0.0000	0/60	Jordan (USD#,SDR)	0.0032	0/60
Dominica #	0.0000	0/60	Cote d'Ivoire (FF#)	0.0000	0/60	Sri Lanka (USD,SDR)	0.0033	0/60
Grenada #	0.0000	0/60	Equatorial Guinea (FF#)	0.0000	0/60	Botswana (SAR#,USD)	0.0048	1/59
Lithuania #	0.0000	0/60	Gabon (FF#)	0.0000	0/60	Malta (FF,USD,UKP)	0.0054	0/60
Maldives #	0.0000	0/60	Kiribati (AD#)	0.0000	0/60	Nepal (IR#,USD)	0.0059	0/60
Micronesia, Fed. Sts. #	0.0000	0/60	Lesotho (SAR#)	0.0000	1/59	Tonga (USD,NZD,AD)	0.0061	0/60
Netherlands Antilles #	0.0000	0/60	Mali (FF#)	0.0000	0/60	Cape Verde (ECU,USD)	0.0072	0/60
Panama #	0.0000	0/60	Namibia (SAR#)	0.0000	1/59			
Qatar #	0.0000	0/60	Niger (FF#)	0.0000	0/60			
Saudi Arabia #	0.0000	0/60	San Marino (ITL#)	0.0000	0/60			
St. Kitts and Nevis #	0.0000	0/60	Senegal (FF#)	0.0000	0/60			
St. Lucia #	0.0000	0/60	Swaziland (SAR#)	0.0000	1/59			
St. Vincent and the Grenadines #	0.0000	0/60	Togo (FF#)	0.0000	0/60			
Syrian Arab Republic #	0.0000	0/60	Comoros (FF#)	0.0000	0/60			
Iraq #	0.0000	0/60	Estonia (DM#)	0.0033	0/60			
United Arab Emirates #	0.0001	0/60	Slovenia (DM#)	0.0063	0/60			
El Salvador #	0.0002	0/60	Croatia (DM#)	0.0069	2/58			
Oman #	0.0002	0/60						
Argentina #	0.0005	0/60						
Egypt, Arab Rep. #	0.0005	0/60						
Hong Kong #	0.0005	0/60						
Lebanon #	0.0010	0/60						
Iran, Islamic Rep. #	0.0015	0/60						
China #	0.0018	0/60						
Costa Rica #	0.0023	0/60						
Bolivia #	0.0023	0/60						
Trinidad and Tobago #	0.0038	0/60						
Nicaragua #	0.0047	0/60						
Bangladesh #	0.0060	0/60						
Gambia, The #	0.0064	0/60						

(b) Intermediate: 0.0075 < Volatility < 0.015; Number of Countries= 29

USD (16)	Volatility	Excl/Incl	Other Single Currency (1)	Volatility	Excl/Incl	Basket of Currencies (12)	Volatility	Excl/Incl
Ethiopia #	0.0080	0/60	Czech Republic (DM#)	0.0148	0/60	Mauritius (USD,DM)	0.0079	1/59
Nigeria #	0.0083	1/59				Tunisia (FF,USD)	0.0084	0/60
Venezuela #	0.0084	4/56				Uruguay (USD#,JY)	0.0084	0/60
Dominican Republic #	0.0089	0/60				Seychelles (USD,SDR)	0.0092	0/60
Azerbaijan #	0.0097	1/59				Hungary (DM,USD,ITL)	0.0093	0/60
Mauritania #	0.0097	1/59				Macedonia, FYR (DM#,ITL)	0.0093	1/59
Peru #	0.0107	0/60				Samoa (SDR,NZD,AD)	0.0107	0/60
Honduras #	0.0110	0/60				Algeria (USD,UKP)	0.0115	0/60
Guyana #	0.0110	0/60				Slovak Republic (DM#,USD)	0.0119	0/60
Vietnam #	0.0111	0/49				Vanuatu (SDR,AD)	0.0128	0/60
Guinea #	0.0114	2/51				Taiwan (USD#,JY)	0.0143	0/60
Yemen, Rep. #	0.0115	3/55				India (USD#,JY)	0.0149	0/60
Armenia #	0.0130	0/60						
Brazil #	0.0134	3/57						
Turkey	0.0136	0/60						
Jamaica #	0.0143	0/60						

(c) Flexible: Volatility > 0.015; Number of Countries = 53

USD (31)	Volatility	Excl/Incl	Other Single Currency (6)	Volatility	Excl/Incl	Basket of Currencies (15)	Volatility	Excl/Incl
Solomon Islands #	0.0150	4/56	Thailand (SID#)	0.0170	6/54	Ghana (USD,DM)	0.0153	1/59
Pakistan #	0.0154	0/56	Malaysia (SID#)	0.0211	3/57	Chile (USD#,JY)	0.0155	0/60
Liberia #	0.0156	4/56	Tajikistan (ITL#)	0.0281	12/45	Singapore (USD,JY)	0.0157	0/60
Rwanda #	0.0169	3/56	Papua New Guinea (AD)	0.0290	0/60	Guinea-Bissau (ITL,UKP)	0.0182	3/57
Suriname #	0.0170	2/51	Belarus (RR#)	0.0307	2/23	Romania (USD,RR)	0.0201	4/56
Paraguay #	0.0173	0/60	Indonesia (SID#)	0.0369	12/48	Bulgaria (ECU#)	0.0213	9/51
Israel #	0.0175	0/60				Poland (DM,USD)	0.0214	0/60
Mongolia #	0.0179	2/58				Cambodia (USD#,THB)	0.0214	1/59
Uganda #	0.0183	0/60				Madagascar (SDR)	0.0222	1/59
Turkmenistan #	0.0192	8/52				Korea, Rep. (SDR#)	0.0251	3/57
South Africa #	0.0201	1/59				Ukraine (USD,ITL)	0.0255	5/55
Guatemala #	0.0205	0/60				Philippines (USD#,JY)	0.0255	1/59
Russian Federation #	0.0206	3/51				Kyrgyz Republic (USD#,RR)	0.0257	4/56
Moldova #	0.0210	4/56				Lao PDR (USD#,THB)	0.0285	10/50
Angola #	0.0216	25/35				Sao Tome and Principe (SDR#)	0.0346	5/55
Haiti #	0.0218	1/59						
Georgia #	0.0218	3/47						
Mozambique #	0.0220	0/60						
Burundi #	0.0223	1/59						
Kenya #	0.0223	2/58						
Tanzania #	0.0229	0/60						
Mexico #	0.0233	3/57						
Zimbabwe	0.0234	6/54						
Colombia #	0.0235	0/60						
Kazakhstan #	0.0241	1/59						
Sudan #	0.0252	5/55						
Malawi #	0.0256	2/58						
Zambia #	0.0257	3/57						
Ecuador #	0.0267	6/54						
Albania	0.0305	3/57						
Sierra Leone	0.0334	4/56						

Note: 1) Total number of countries is 157.
2-4) Same as in Table 2-A.
5) There is no currency weight for Congo, Dem. Rep., with the volatility of 0.0553 and Excl/Incl being 11/12.

Table 3. The Estimated Size of the Currency Areas for the US Dollar, the Japanese Yen and the Euro

Percentage Averages Based on 1990-99 Data

(1) Measured by Gross Domestic Product (GDP) in Current US Dollars; Billion US Dollars in Parentheses

	Case of EMU-12					Case of EMU-15					Regional Total	
	US dollar Area	Japanese Yen Area	Euro Area	UK Pound Area	Other	US dollar Area	Japanese Yen Area	Euro Area	UK Pound Area	Other		
INDUSTRIAL COUNTRIES	29.8	15.8	26.4	4.9	0.1	29.6	15.8	31.5	0.0	0.0	76.9	(20,182)
EUROPEAN UNION-15	0.2	0.0	24.8	4.4	0.1	0.0	0.0	29.5	0.0	0.0	29.5	(7,727)
EMU-12	0.0	0.0	23.7	0.0	0.0	0.0	0.0	23.7	0.0	0.0	23.7	(6,214)
3 Other EU Members	0.2	0.0	1.1	4.4	0.1	0.0	0.0	5.8	0.0	0.0	5.8	(1,513)
UNITED STATES	26.5	0.0	0.0	0.0	0.0	26.5	0.0	0.0	0.0	0.0	26.5	(6,962)
JAPAN	0.0	15.7	0.0	0.0	0.0	0.0	15.7	0.0	0.0	0.0	15.7	(4,117)
OTHER	3.0	0.1	1.6	0.4	0.0	3.0	0.1	2.1	0.0	0.0	5.2	(1,377)
DEVELOPING COUNTRIES	18.2	0.9	2.3	0.5	1.2	15.6	0.8	5.4	0.0	1.2	23.1	(6,050)
AFRICA	0.9	0.0	0.4	0.1	0.1	0.9	0.0	0.5	0.0	0.1	1.5	(405)
ASIA	7.3	0.8	0.9	0.3	0.3	7.3	0.8	1.1	0.0	0.3	9.5	(2,492)
EUROPE	2.8	0.0	0.7	0.1	0.4	0.3	0.0	3.4	0.0	0.4	4.0	(1,059)
MIDDLE EAST	1.6	0.0	0.0	0.1	0.1	1.6	0.0	0.1	0.0	0.1	1.9	(491)
WESTERN HEMISPHERE	5.5	0.1	0.3	0.0	0.3	5.5	0.1	0.3	0.0	0.3	6.1	(1,603)
WORLD TOTAL	47.9	16.7	28.7	5.4	1.3	45.2	16.7	36.9	0.0	1.2	100.0	(26,233)
	(12,570)	(4,376)	(7,523)	(1,413)	(351)	(11,859)	(4,374)	(9,691)	(0)	(309)	(26,233)	

(2) Measured by Total Trade Flows (Exports plus Imports) in Current US Dollars; Billion US Dollars in Parentheses

	Case of EMU-12					Case of EMU-15					Regional Total	
	US dollar Area	Japanese Yen Area	Euro Area	UK Pound Area	Other	US dollar Area	Japanese Yen Area	Euro Area	UK Pound Area	Other		
INDUSTRIAL COUNTRIES	18.5	7.3	35.9	6.1	0.1	18.3	7.3	42.4	0.0	0.5	68.0	(6,267)
EUROPEAN UNION-15	0.3	0.0	33.6	4.5	0.1	0.0	0.0	39.4	0.0	0.0	39.4	(3,634)
EMU-12	0.0	0.0	31.9	0.0	0.0	0.0	0.0	31.9	0.0	0.0	31.9	(2,939)
3 Other EU Members	0.3	0.0	1.7	5.5	0.1	0.0	0.0	7.5	0.0	0.0	7.5	(695)
UNITED STATES	14.0	0.0	0.0	0.0	0.0	14.0	0.0	0.0	0.0	0.0	14.0	(1,289)
JAPAN	0.0	7.2	0.0	0.0	0.0	0.0	7.2	0.0	0.0	0.0	7.2	(662)
OTHER	4.3	0.1	2.3	0.7	0.0	4.3	0.1	3.0	0.0	0.0	7.4	(681)
DEVELOPING COUNTRIES	24.2	1.8	3.9	0.8	1.3	21.6	1.7	7.5	0.0	1.2	32.0	(2,950)
AFRICA	1.1	0.0	0.5	0.2	0.2	1.1	0.0	0.7	0.0	0.2	2.0	(185)
ASIA	12.9	1.6	1.7	0.4	0.4	12.9	1.6	2.1	0.0	0.4	17.0	(1,569)
EUROPE	2.9	0.0	1.5	0.1	0.4	0.3	0.0	4.3	0.0	0.3	4.9	(454)
MIDDLE EAST	2.8	0.1	0.1	0.1	0.2	2.8	0.1	0.2	0.0	0.2	3.3	(302)
WESTERN HEMISPHERE	4.5	0.0	0.1	0.0	0.1	4.5	0.0	0.1	0.0	0.1	4.8	(440)
WORLD TOTAL	42.8	9.1	39.8	6.9	1.5	39.9	9.1	49.9	0.0	1.2	100.0	(9,216)
	(3,942)	(835)	(3,670)	(634)	(135)	(3,674)	(835)	(4,596)	(0)	(112)	(9,216)	

Note: (a) The EMU-12 includes Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, and Spain.

(b) Three other EU Members include Denmark, Sweden, and the United Kingdom.

(c) The case of EMU-15 also assumes that Central and European countries in transition (e.g., Hungary, Poland and Romania) stabilize exchange rates to the Euro.

Table 4. Official Exchange Rate Arrangements in the East Asian Economies

Country	Article VIII (Date Accepted)	Pre-crisis and Mid-crisis Exchange Rate Arrangements (Dates of Change)	Post-crisis Exchange Rate Arrangement (December 2001)
Japan	1964/04/01	Independently floating (1982/07-present)	Independently floating
Korea	1988/11/01	Managed floating (1982/06-1997/11); Independently floating (1997/11-present)	Independently floating
China, P.R.	1996/12/01	Managed floating (1986/10-1998/09); Conventional fixed peg to the US dollar (1999/01-present)	Conventional fixed peg to the US dollar
Hong Kong	1961/02/15	Currency board arrangement with a peg to the US dollar (1983/10-present)	Currency board arrangement with a peg to the US dollar
Taiwan (a)	--	Managed floating (1989/04-present)	Managed floating
Indonesia	1988/05/07	Managed floating (1983/12-1997/07); Independently floating (1997/08-2001/09)	Managed floating with no pre-announced path for exchange rate (2001/09-present)
Malaysia	1968/11/11	Peg to other currency composite (1975/09-1993/06); Managed floating (1993/06-1998/09); Peg to the US dollar (1998/09-present)	Conventional fixed peg to the US dollar
Philippines	1995/09/08	Independently floating (1984/11-present)	Independently floating
Singapore	1968/11/09	Managed floating (1987/12-present)	Managed floating with no pre-announced path for exchange rate
Thailand	1990/05/04	Peg to other currency composite (1984/11-1997/06); Independently floating (1997/07-2001/09)	Managed floating with no pre-announced path for exchange rate (2001/09-present)
Brunei	1995/10/10	Currency board arrangement with a peg to the Singapore dollar (1996/03-present)	Currency board arrangement with a peg to the Singapore dollar
Cambodia	2002/01/01	Managed floating (1993/06-present))	Managed floating with no pre-announced path for exchange rate
Lao, P.D.R.	Article XIV	Managed floating (1989/03-1995/09); Independently floating (1995/09-1997/06); Managed floating (1997/06-present)	Managed floating with no pre-announced path for exchange rate
Myanmar	Article XIV	Peg to the SDR (1975/02-2001/12)	Managed floating with no pre-announced path for exchange rate (2001/12-present)
Vietnam	Article XIV	Peg to the US dollar (1989/03-1990/03); Managed floating (1993/03-1998/09);	Pegged exchange rate within horizontal bands (1999/01-2001/12); Managed floating with no pre-announced path for exchange rate (2001/12-present)

Notes: (a) Information on Taiwan is based on Fisher (2001).
Source: International Monetary Fund, *International Financial Statistics*, various issues; and *Annual Report on Exchange Arrangements and Exchange Restrictions 2001*.

Table 5.
Regression Results of Exchange Rate Movements for Major Emerging East Asian Economies: Pre-crisis, Mid-crisis, and Post-crisis Periods

(a) Hong Kong Dollar

Period	Const	USD	JY	EURO	R2-adj	D.W.	Std-res	No. obs.
90/01-91/06	-0.014	0.993 **	-0.001	0.007	0.9973	1.566	0.000425	389
91/07-92/12	-0.008	0.998 **	-0.011	0.006	0.9956	2.579	0.000597	394
93/01-94/06	-0.004	0.995 **	0.000	0.003	0.9975	2.147	0.000358	390
94/07-95/12	0.002	0.997 **	0.000	0.002	0.9994	2.018	0.000204	391
96/01-97/06	0.004	0.997 **	0.009 **	-0.007	0.9977	2.598	0.000277	391
97/07-98/12	0.000	1.001 **	0.006 *	0.000	0.9938	2.773	0.000528	393
99/01-00/06	0.016 **	0.993 **	0.001	0.003	0.9998	2.116	0.000087	390
00/07-01/12	0.000	1.004 **	0.000	-0.002	0.9999	2.054	0.000061	392
02/01-02/06	0.002	0.998 **	0.000	0.001	0.9999	2.124	0.000024	124

(b) Korean Won

Period	Const	USD	JY	EURO	R2-adj	D.W.	Std-res	No. obs.
90/01-91/06	0.172	1.004 **	-0.013	-0.011	0.9336	1.968	0.002149	389
91/07-92/12	0.210	1.026 **	-0.016	-0.006	0.8098	2.005	0.004458	394
93/01-94/06	0.045	1.014 **	-0.021 *	-0.002	0.9720	2.255	0.001208	390
94/07-95/12	-0.127	0.983 **	0.081 **	-0.045 *	0.9329	2.008	0.002205	391
96/01-97/06	0.354 **	0.960 **	0.065 **	0.020	0.8583	1.804	0.002378	391
97/07-98/12	0.758	1.149 **	0.039	0.084	0.0921	1.607	0.024301	393
99/01-00/06	-0.172	1.044 **	0.063 *	-0.036	0.7220	1.645	0.004023	390
00/07-01/12	0.256	0.982 **	0.284 **	-0.056	0.7550	2.107	0.004476	392
02/01-02/06	-0.510 *	0.654 *	0.175 **	0.101	0.7504	2.092	0.002783	124

(c) Singapore Dollar

Period	Const	USD	JY	EURO	R2-adj	D.W.	Std-res	No. obs.
90/01-91/06	-0.212	0.739 **	0.065 **	0.199 **	0.9167	2.309	0.002188	389
91/07-92/12	-0.140	0.758 **	0.077 **	0.185 **	0.9482	2.309	0.001857	394
93/01-94/06	-0.160	0.865 **	0.049 **	0.098 **	0.9199	2.131	0.001960	390
94/07-95/12	-0.189	0.789 **	0.098 **	0.117 **	0.9383	2.052	0.001915	391
96/01-97/06	-0.019	0.798 **	0.096 **	0.144 **	0.9294	2.167	0.001503	391
97/07-98/12	0.381	0.635 **	0.342 **	0.190 *	0.4851	2.181	0.006911	393
99/01-00/06	0.103	1.219 **	0.123 **	-0.194 **	0.8505	1.925	0.002547	390
00/07-01/12	0.035	0.948 **	0.197 **	-0.089 *	0.8975	1.942	0.002236	392
02/01-02/06	-0.170	0.610 **	0.223 **	0.064	0.8731	2.019	0.000346	124

(d) New Taiwan Dollar

Period	Const	USD	JY	EURO	R2-adj	D.W.	Std-res	No. obs.
90/01-91/06	0.040	0.840 **	-0.017	0.240 **	0.4605	2.849	0.008475	389
91/07-92/12	-0.154	0.967 **	0.033	-0.003	0.6336	2.913	0.006803	394
93/01-94/06	0.193	1.012 **	0.055	-0.019	0.6664	2.875	0.005199	390
94/07-95/12	0.023	0.948 **	0.060 *	0.028	0.8956	2.022	0.002807	391
96/01-97/06	0.024	0.946 **	0.036	-0.001	0.8264	2.734	0.002573	391
97/07-98/12	0.382	0.867 **	0.090 **	0.068	0.5698	1.702	0.005472	393
99/01-00/06	-0.131	0.999 **	-0.007	-0.012	0.8920	2.289	0.002128	390
00/07-01/12	0.322 **	1.019 **	0.000	-0.017	0.9030	1.799	0.002248	392
02/01-02/06	-0.200 #	0.990 **	0.109 **	-0.053	0.9320	2.475	0.001307	124

(e) Indonesian Rupiah

Period	Const	USD	JY	EURO	R2-adj	D.W.	Std-res	No. obs.
90/01-91/06	0.227	0.962 **	0.029	0.030	0.9094	2.084	0.002555	389
91/07-92/12	0.145 **	0.997 **	-0.006	0.016	0.9903	2.292	0.000900	394
93/01-94/06	0.131 *	0.995 **	0.010	-0.002	0.9739	2.044	0.001161	390
94/07-95/12	0.153 *	0.994 **	-0.015	0.011	0.9710	2.004	0.001438	391
96/01-97/06	0.156 *	1.009 **	0.001	0.002	0.9372	2.165	0.001528	391
97/07-98/12	2.982	0.512	0.692 *	-0.067	0.0167	1.961	0.053151	393
99/01-00/06	0.290	2.147 *	0.270 **	-0.643	0.1880	1.689	0.015509	390
00/07-01/12	0.354	1.423 **	0.140	-0.138	0.3370	1.719	0.012363	392
02/01-02/06	-1.410 *	0.289	0.012	0.300	0.2870	1.752	0.006755	124

Table 5. (Continued)

(f) Malaysian Ringgit

Period	Const	USD	JY	EURO	R2-adj	D.W.	Std-res	No. obs.
90/01-91/06	0.072	0.892 **	0.027 **	0.096 **	0.9739	2.207	0.001279	389
91/07-92/12	-0.138	0.874 **	0.025	0.090 **	0.9487	2.006	0.001944	394
93/01-94/06	0.004	0.906 **	0.001	0.020	0.8170	1.507	0.003072	390
94/07-95/12	-0.062	0.869 **	0.059 **	0.084 **	0.9532	1.970	0.001738	391
96/01-97/06	-0.049	0.885 **	0.034 *	0.086 **	0.9226	2.018	0.001611	391
97/07-98/12	1.032	0.883 **	0.300 **	-0.035	0.1862	1.742	0.014911	393
99/01-00/06	0.000	1.043 **	0.000	-0.019 **	0.9980	2.943	0.000265	390
00/07-01/12	0.000	1.000 **	0.000	0.000 #	1.0000	3.040	0.000000	392
02/01-02/06	0.000	1.000 **	0.000	0.000	1.0000	2.919	0.000000	124

(g) Philippines Peso

Period	Const	USD	JY	EURO	R2-adj	D.W.	Std-res	No. obs.
90/01-91/06	0.571	1.054 **	0.043	-0.048	0.6891	2.011	0.005762	389
91/07-92/12	-0.363	1.048 **	-0.110	0.101	0.6700	1.991	0.006458	394
93/01-94/06	0.309	0.973 **	-0.006	-0.026	0.6154	2.013	0.005375	390
94/07-95/12	-0.045	0.986 **	0.062	-0.059	0.7805	2.221	0.004306	391
96/01-97/06	0.020	1.004 **	-0.005	-0.002	0.9936	2.202	0.000469	391
97/07-98/12	0.998	0.876 **	0.285 **	-0.022	0.1924	1.716	0.014420	393
99/01-00/06	0.268	1.410 **	0.085 **	-0.243 *	0.7190	1.968	0.006247	390
00/07-01/12	0.406	0.779 *	0.116	0.093	0.4460	2.067	0.008187	392
02/01-02/06	-0.150	0.628 *	0.031	0.150	0.7460	1.947	0.002744	124

(h) Thai Baht

Period	Const	USD	JY	EURO	R2-adj	D.W.	Std-res	No. obs.
90/01-91/06	0.014	0.961 **	0.031 *	0.023	0.9543	2.034	0.001766	389
91/07-92/12	-0.017	0.957 **	0.019	0.043 **	0.9782	2.007	0.001334	394
93/01-94/06	-0.037	0.972 **	0.012	0.006	0.9778	2.040	0.001049	390
94/07-95/12	0.017	0.877 **	0.069 **	0.049 **	0.9882	2.410	0.000848	391
96/01-97/06	-0.053	0.823 **	0.178 **	0.154	0.4746	1.978	0.006179	391
97/07-98/12	1.014	0.608 **	0.311 **	0.099	0.1046	1.877	0.017221	393
99/01-00/06	0.178	1.432 **	0.130 **	-0.297 *	0.6291	1.933	0.008783	390
00/07-01/12	0.189	0.971 **	0.197 **	-0.069	0.7902	1.980	0.003625	392
02/01-02/06	-0.310 *	0.697 **	0.176 **	0.070	0.9030	1.861	0.001558	124

(i) Chinese Renminbi

Period	Const	USD	JY	EURO	R2-adj	D.W.	Std-res	No. obs.
90/01-91/06	0.317	1.025 **	-0.036	0.007	0.7145	2.007	0.005179	389
91/07-92/12	0.211	1.037 **	-0.041	-0.032	0.8889	2.042	0.003212	394
93/01-94/06	1.037	0.969 **	0.082	0.064	0.1159	2.007	0.019926	390
94/07-95/12	-0.113 *	1.030 **	-0.001	-0.030 **	0.9829	2.082	0.001116	391
96/01-97/06	0.000	1.018 **	-0.010	-0.012	0.9335	2.832	0.001569	391
97/07-98/12	-0.008	0.996 **	0.001	-0.002	0.9919	2.471	0.000597	393
99/01-00/06	0.000	1.002 **	0.000	-0.001	0.9999	2.019	0.000033	390
00/07-01/12	0.000	0.998 **	0.000	0.001	1.0000	2.326	0.000043	392
02/01-02/06	0.000	1.001 **	-0.001 *	0.000	1.0000	2.121	0.000018	124

Note: Double asterisks (**) and a single asterisk (*) indicate that the estimated coefficients are statistically significant at the 1% and 5% levels, respectively.

Table 6. Regional Breakdown of East Asian Trade, Average for 1990-98 (% Share of Total)

(1) Exports

(percent)

Exporters \ Exports to	ASEAN	Other EA	EA-14	EA-14 & J.	Japan	US	EU	ROW
Brunei Darussalam	21.1	16.3	37.4	93.0	55.6	2.7	2.2	2.1
Cambodia	56.8	5.5	62.3	69.0	6.7	6.0	18.6	6.4
Indonesia	14.2	16.6	30.8	60.1	29.3	13.8	14.5	11.5
Laos	46.5	5.3	51.9	62.6	10.7	2.6	18.0	16.8
Malaysia	28.2	13.6	41.7	54.9	13.2	19.2	14.8	11.0
Myanmar	22.2	20.4	42.6	50.0	7.4	7.2	8.4	34.4
Philippines	10.1	11.4	21.5	38.5	17.0	36.5	18.2	6.7
Singapore	26.1	17.2	43.2	50.9	7.7	19.6	14.4	15.1
Thailand	17.3	11.0	28.3	44.8	16.5	20.7	18.2	16.3
Vietnam	20.3	18.1	38.4	62.8	24.4	2.0	12.2	23.0
China	6.3	35.4	41.7	58.4	16.7	15.1	12.2	14.2
Hong Kong SAR	6.6	36.2	42.8	48.5	5.7	22.7	16.1	12.7
Korea	12.4	16.4	28.8	42.8	14.0	21.4	12.8	23.0
Taiwan Province of China	11.7	22.6	34.3	45.2	11.0	27.0	15.0	12.8
ASEAN	22.1	14.9	37.0	52.4	15.4	19.1	15.2	13.3
EA-14	13.6	23.7	37.2	50.1	12.9	20.7	14.5	14.6
EA-14 & Japan	13.8	23.2	37.0	45.4	8.3	23.7	15.6	15.3

(2) Imports

(percent)

Importers\ Imports from	ASEAN	Other EA	EA-14	EA-14 & J.	Japan	US	EU	ROW
Brunei Darussalam	41.5	6.3	47.8	58.6	10.8	14.0	21.4	6.0
Cambodia	57.5	13.6	71.2	81.1	9.9	1.6	9.7	7.6
Indonesia	11.5	15.6	27.2	49.2	22.1	11.8	20.2	18.7
Laos	61.8	8.8	70.6	80.0	9.4	0.5	3.7	15.8
Malaysia	19.9	13.7	33.7	58.5	24.9	16.6	14.2	10.6
Myanmar	41.7	31.6	73.2	82.7	9.5	1.4	9.0	7.0
Philippines	11.3	17.6	28.9	50.1	21.2	19.5	11.0	19.4
Singapore	21.2	13.9	35.2	55.2	20.0	16.3	13.4	15.1
Thailand	13.1	13.0	26.1	54.6	28.4	12.1	15.2	18.2
Vietnam	28.4	26.4	54.8	64.7	9.9	1.0	10.2	24.0
China	7.0	29.2	36.1	55.6	19.5	11.7	15.0	17.7
Hong Kong SAR	9.1	50.7	59.9	75.1	15.2	7.6	10.3	7.0
Korea	8.0	7.5	15.5	38.5	23.0	22.2	13.1	26.2
Taiwan Province of China	9.9	7.9	17.7	46.2	28.5	21.0	14.9	17.8
ASEAN	18.0	14.6	32.7	55.2	22.6	14.8	14.5	15.5
EA-14	12.1	22.5	34.6	56.0	21.4	14.6	13.5	15.8
EA-14 & Japan	12.7	21.5	34.2	49.4	15.3	17.0	13.8	19.8

(3) Total Trade (Exports plus Imports)

(percent)

Trading Economies\ Trade with	ASEAN	Other EA	EA-14	EA-14 & J.	Japan	US	EU	ROW
Brunei Darussalam	30.2	11.8	42.0	78.4	36.4	7.3	10.4	3.9
Cambodia	58.8	10.6	69.4	78.4	9.0	3.5	11.6	6.5
Indonesia	12.9	16.2	29.1	55.1	26.0	13.0	17.1	14.8
Laos	55.3	7.6	62.9	74.0	11.1	1.2	8.5	16.3
Malaysia	24.0	13.6	37.7	56.6	19.0	17.9	14.6	10.8
Myanmar	34.8	27.8	62.6	71.3	8.7	3.3	8.7	16.6
Philippines	10.8	15.1	25.9	45.4	19.5	26.3	13.9	14.3
Singapore	23.5	15.5	39.1	53.1	14.1	17.9	13.9	15.1
Thailand	15.1	12.1	27.2	50.2	23.0	16.0	16.6	17.3
Vietnam	24.8	23.0	47.8	64.1	16.3	1.4	11.0	23.5
China	6.6	32.4	39.0	57.1	18.1	13.5	13.5	15.9
Hong Kong SAR	7.9	43.7	51.6	62.1	10.6	15.0	13.1	9.8
Korea	10.1	11.9	22.0	40.6	18.6	21.7	13.0	24.6
Taiwan Province of China	10.8	15.6	26.5	45.7	19.2	24.2	15.0	15.1
ASEAN	19.9	14.7	34.7	53.8	19.1	16.9	14.8	14.5
EA-14	12.8	23.1	35.9	53.0	17.2	17.7	14.1	15.2
EA-14 & Japan	13.3	22.4	35.6	47.3	11.7	20.5	14.8	17.5

Notes: (a) Other EA includes China, Hong Kong SAR, Korea and Taiwan POC. EA-14 includes ASEAN and other EA.
(b) ROW is the rest of the world.

Source: Kawai and Takagi (2000). Constructed from IMF, *Direction of Trade Statistics* .

Table 7. FDI Inflows to East Asia, 1990-98

(Millions of $US; Percent of Total)

Recipients / Investors	ASEAN (a)	China	Korea	Taiwan	Total
Japan	57,693	29,715	2,769	4,935	95,112
	(19.2)	(5.5)	(10.5)	(22.7)	(10.7)
USA	35,082	42,658	9,331	3,885	90,956
	(11.7)	(7.9)	(35.3)	(17.8)	(10.3)
Europe (b)	40,375	27,311	8,935	2,484	79,105
	(13.4)	(5.1)	(33.8)	(11.4)	(8.9)
ASEAN	27,493	33,421	3,271	1,108	65,293
	(9.1)	(6.2)	(12.4)	(5.1)	(7.4)
Other East Asia (c)	46,731	336,132	551	1,571	384,985
	(15.5)	(62.4)	(2.1)	(7.2)	(43.4)
Total, including others	301,074	538,477	26,422	21,778	887,751
	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)

Notes: (a) 1991-98 for Brunei and Vietnam; 1992-98 for the Philippines; and 1994-98 for Cambodia
(b) Authors' estimates. These figures underestimate the actual volumes because some countries with small volumes are not included.
(c) Hong Kong, Korea, and Taiwan only.

Source: Kawai and Takagi (2000). Constructed from ASEAN Secretariat, *ASEAN Investment Report 1999: Trends and Developments in Foreign Direct Investment*, Jakarta, 1999; Japan External Trade Organization

Table 8. Progress on the Chiang Mai Initiative

BSA	Currencies	Conclusion Dates	Size
Japan-Korea	USD/Won	July 4, 2001	US$ 7 billion (a)
Japan-Thailand	USD/Baht	July 30, 2001	US$ 3 billion
Japan-Philippines	USD/Peso	August 27, 2001	US$ 3 billion
Japan-Malaysia	USD/Ringgit	October 5, 2001	US$ 3.5 billion (a)
China-Thailand	USD/Baht	December 6, 2001	US$ 2 billion
Japan-China	Yen/Renminbi	March 28, 2002	US$ 3 billion equivalent
China-Korea	Renminbi/Won	June 24, 2002	US$ 2 billion equivalent
Korea-Thailand	USD/Won or Baht	June 25, 2002	US$ 1 billion
Korea-Malaysia	Under negotiation		
Korea-Philippines	Under negotiation		
Japan-Singapore	Under negotiation		
Japan-Indonesia	Under negotiation		
China- Philippines	Under negotiation		
China- Malaysia	To be negotiated in the near future		

Note: (a) The US dollar amounts include the amounts committed under the New Miyazawa Initiative, US$5 billion for Korea and US$2.5 billion for Malaysia.
Source: Kuroda and Kawai (2002).

Appendix Table. Rolling Regressions of Exchange Rate Movements

(a) Hong Kong Dollar

Period	Const	USD	JY	EURO	R2-adj	D.W.	Std-res	No. obs.
1996/01-96/03	-0.012	0.993 **	0.011	-0.028	0.9900	2.514	0.000455	65
1996/02-96/04	0.005	0.996 **	0.001	0.002	0.9996	2.233	0.000093	64
1996/03-96/05	0.008	0.988 **	0.003	0.009 *	0.9995	2.129	0.000092	66
1996/04-96/06	0.014	0.992 **	0.007 #	0.001	0.9993	1.943	0.000125	65
1996/05-96/07	-0.002	0.991 **	0.006	-0.002	0.9995	1.762	0.000130	66
1996/06-96/08	-0.008	1.000 **	-0.002	-0.011	0.9992	2.100	0.000156	65
1996/07-96/09	-0.015	0.997 **	-0.007 #	0.001	0.9995	2.536	0.000134	66
1996/08-96/10	-0.001	1.003 **	-0.007 #	-0.003	0.9993	2.678	0.000122	66
1996/09-96/11	-0.001	1.000 **	0.000	-0.001	0.9998	2.595	0.000072	65
1996/10-96/12	-0.003	0.997 **	0.000	-0.002	0.9997	1.964	0.000096	66
1996/11-97/01	0.035 #	1.001 **	0.000	0.000	0.9994	1.956	0.000157	66
1996/12-97/02	0.023	0.994 **	0.011 #	-0.001	0.9989	2.045	0.000209	65
1997/01-97/03	0.030	0.999 **	0.012 *	-0.002	0.9990	2.180	0.000203	64
1997/02-97/04	-0.010	0.995 **	0.016 **	-0.006	0.9987	2.597	0.000227	63
1997/03-97/05	0.012	0.998 **	0.021 *	-0.006	0.9974	2.984	0.000389	65
1997/04-97/06	0.030	1.006 **	0.022 **	-0.016	0.9971	2.910	0.000406	65
1997/05-97/07	0.019	1.001 **	0.019 *	-0.005	0.9967	2.791	0.000415	66
1997/06-97/08	0.004	0.999 **	0.007	0.011	0.9976	2.162	0.000287	65
1997/07-97/09	-0.026	0.992 **	0.005	0.013 #	0.9985	1.929	0.000245	66
1997/08-97/10	-0.052	0.995 **	0.023	0.019	0.9789	2.648	0.001015	66
1997/09-97/11	-0.070	0.985 **	0.025	0.011	0.9759	2.760	0.001029	65
1997/10-97/12	-0.004	0.992 **	0.022	0.009	0.9755	2.713	0.001034	66
1997/11-98/01	0.018	1.009 **	0.015	-0.025	0.9892	2.917	0.000663	65
1997/12-98/02	0.048	1.016 **	0.024 *	-0.036	0.9906	2.965	0.000643	65
1998/01-98/03	0.005	1.022 **	0.023 #	-0.052 *	0.9915	3.040	0.000641	64
1998/02-98/04	0.014	1.008 **	0.006	-0.025 *	0.9980	2.568	0.000273	64
1998/03-98/05	0.011	1.004 **	-0.001	-0.009	0.9980	2.759	0.000245	65
1998/04-98/06	-0.004	0.997 **	0.006	-0.001	0.9966	3.003	0.000255	65
1998/05-98/07	-0.012	0.997 **	0.007 *	0.003	0.9977	2.883	0.000212	66
1998/06-98/08	-0.004	0.997 **	0.007 *	0.003	0.9987	2.870	0.000215	66
1998/07-98/09	-0.003	1.001 **	-0.001	0.011	0.9988	2.037	0.000221	66
1998/08-98/10	-0.004	0.998 **	0.000	0.006	0.9993	1.980	0.000221	65
1998/09-98/11	-0.011	1.000 **	0.000	0.003	0.9991	2.133	0.000239	65
1998/10-98/12	-0.004	1.000 **	0.000	-0.001	0.9997	2.313	0.000163	66
1998/11-99/01	0.007	1.002 **	-0.001	-0.003	0.9997	2.415	0.000155	65
1998/12-99/02	0.006	0.999 **	-0.001	0.001	0.9999	2.142	0.000105	64
1999/01-99/03	0.002	0.997 **	-0.001	0.001	0.9999	2.435	0.000082	64
1999/02-99/04	0.001	0.998 **	-0.001	0.001	0.9997	2.157	0.000087	65
1999/03-99/05	0.014	0.999 **	0.001	0.000	0.9997	2.308	0.000085	66
1999/04-99/06	0.019 *	1.000 **	0.001	0.000	0.9998	2.056	0.000074	65
1999/05-99/07	0.022 **	1.001 **	0.000	-0.003	0.9999	1.994	0.000058	65
1999/06-99/08	0.021 **	0.988 **	0.001	0.007	0.9999	1.917	0.000050	66
1999/07-99/09	0.020 **	0.971 **	0.002 *	0.015 #	0.9999	2.133	0.000055	66
1999/08-99/10	0.018 **	0.976 **	0.001 #	0.013	0.9999	2.053	0.000052	65
1999/09-99/11	0.004	0.977 **	0.000	0.012	0.9997	1.104	0.000099	65
1999/10-99/12	0.010	1.002 **	0.002	-0.003	0.9994	2.100	0.000143	66
1999/11-00/01	0.020	0.995 **	0.002	0.001	0.9994	2.099	0.000150	66
1999/12-00/02	0.029 #	1.014 **	0.004	-0.009	0.9997	1.690	0.000125	65
2000/01-00/03	0.028 **	0.983 **	0.001	0.009	0.9999	1.696	0.000068	65
2000/02-00/04	0.018 *	0.992 **	0.001	0.004	0.9999	2.202	0.000055	64
2000/03-00/05	0.018 **	0.994 **	0.000	0.001	1.0000	2.108	0.000047	66
2000/04-00/06	0.017 *	1.006 **	0.000	-0.003	0.9999	1.610	0.000063	65
2000/05-00/07	0.016 #	1.013 **	0.000	-0.006 #	0.9999	1.737	0.000066	66
2000/06-00/08	0.013 #	1.021 **	0.001	-0.010 *	0.9999	1.815	0.000064	66
2000/07-00/09	0.001	1.013 **	-0.001	-0.006 *	0.9999	2.235	0.000064	65
2000/08-00/10	0.002	1.005 **	-0.005 *	0.000	0.9999	2.413	0.000086	66
2000/09-00/11	0.004	1.004 **	-0.005	0.000	0.9998	2.055	0.000102	65
2000/10-00/12	0.007	0.999 **	-0.001	0.001	0.9997	1.932	0.000113	65
2000/11-01/01	-0.001	1.013 **	0.002	-0.008	0.9998	1.672	0.000087	66
2000/12-01/02	0.001	1.008 **	0.001	-0.005	0.9999	1.854	0.000067	64
2001/01-01/03	-0.001	1.004 **	0.000	-0.002	1.0000	2.137	0.000035	65
2001/02-01/04	0.000	0.998 **	-0.001	0.001	1.0000	2.378	0.000045	63
2001/03-01/05	0.000	0.993 **	0.000	0.004	1.0000	2.522	0.000042	66
2001/04-01/06	0.001	0.998 **	0.000	0.001	1.0000	2.408	0.000039	65
2001/05-01/07	0.002	0.997 **	0.000	0.001	1.0000	2.034	0.000020	66
2001/06-01/08	0.000	0.998 **	0.001	0.001	1.0000	1.667	0.000023	66
2001/07-01/09	-0.001	1.004 **	0.000	-0.002 *	1.0000	2.311	0.000029	65
2001/08-01/10	0.000	1.005 **	-0.001	-0.002	1.0000	2.052	0.000044	66
2001/09-01/11	-0.002	1.003 **	-0.001	-0.002	1.0000	2.318	0.000046	65
2001/10-01/12	-0.001	0.994 **	-0.001	0.004	0.9999	1.972	0.000050	66
2001/11-02/01	-0.001	0.994 **	0.000	0.004 *	1.0000	1.868	0.000040	66
2001/12-02/02	0.004	0.997 **	-0.001	0.003	1.0000	1.659	0.000037	64
2002/01-02/03	0.004	0.998 **	0.000	0.001	1.0000	2.077	0.000028	64
2002/02-02/04	0.000	0.997 **	-0.001	0.001	1.0000	2.314	0.000024	63
2002/03-02/05	0.002	0.996 **	0.000	0.002	1.0000	2.105	0.000023	66
2002/04-02/06	0.001	0.998 **	0.000	0.001	1.0000	2.248	0.000019	60

Note: Double asterisks (**), a single asterisk (*) and a pound (#) indicate that the estimated coefficients are statistically significant at the 1%, 5%, and 10% levels, respectively.

Appendix Table (Continued)

(b) Korean Won

Period	Const	USD	JY	EURO	R2-adj	D.W.	Std-res	No. obs.
1996/01-96/03	0.069	0.832 **	0.193 *	0.015	0.7622	2.024	0.002447	65
1996/02-96/04	-0.138	0.812 **	0.091 #	0.053	0.8885	1.945	0.001466	64
1996/03-96/05	0.051	0.897 **	0.063	0.025	0.8871	1.788	0.001416	66
1996/04-96/06	0.510 #	0.831 **	0.087	0.073	0.7971	1.400	0.002152	65
1996/05-96/07	0.733 *	0.720 **	0.112	0.190	0.7784	1.821	0.002697	66
1996/06-96/08	0.669 #	0.680 **	0.144	0.184	0.7761	1.778	0.002690	65
1996/07-96/09	0.255	0.807 **	0.068	0.083	0.8271	2.067	0.002448	66
1996/08-96/10	0.168	0.924 **	0.062	-0.016	0.8087	1.769	0.002222	66
1996/09-96/11	0.151	0.921 **	0.127 #	0.000	0.8475	2.007	0.002275	65
1996/10-96/12	0.410	0.836 **	0.192 **	0.149 #	0.8965	1.318	0.001995	66
1996/11-97/01	0.678 **	0.929 **	0.081	0.070	0.9303	1.932	0.001780	66
1996/12-97/02	0.852 *	1.049 **	0.065	0.066	0.8352	1.653	0.003096	65
1997/01-97/03	1.136 *	1.184 **	0.044	-0.067	0.8306	1.656	0.003311	64
1997/02-97/04	0.592	1.183 **	0.028	-0.058	0.8264	1.655	0.003303	63
1997/03-97/05	0.495 #	1.068 **	0.022	-0.088	0.9383	1.783	0.001994	65
1997/04-97/06	-0.137	0.988 **	-0.008	0.006	0.9838	2.354	0.000960	65
1997/05-97/07	-0.060	0.982 **	0.000	0.025	0.9771	2.335	0.001093	66
1997/06-97/08	0.175	0.983 **	-0.016	0.049	0.9374	2.539	0.001500	65
1997/07-97/09	0.441 *	0.968 **	-0.011	0.053	0.9331	2.617	0.001624	66
1997/08-97/10	1.035	1.019 **	0.070	0.347 *	0.6314	2.091	0.006180	66
1997/09-97/11	4.177 #	1.100 *	-0.061	-0.579	0.0445	2.491	0.019299	65
1997/10-97/12	10.149	1.925	-0.645	-0.150	-0.0109	1.466	0.050732	66
1997/11-98/01	8.484	2.650 #	-0.631	-1.045	0.0056	1.437	0.054698	65
1997/12-98/02	5.371	2.043	-0.245	0.509	0.0250	1.453	0.052364	65
1998/01-98/03	-2.909	1.367 #	-0.174	0.134	0.0797	1.840	0.025593	64
1998/02-98/04	-1.956	0.639	0.109	0.463	0.0594	1.464	0.017073	64
1998/03-98/05	-2.020	-0.172	0.094	1.488 #	0.0537	1.729	0.015661	65
1998/04-98/06	0.194	0.391	0.143	1.327 *	0.1797	2.020	0.010588	65
1998/05-98/07	-1.235	0.828 *	-0.020	1.032 #	0.1590	2.177	0.011850	66
1998/06-98/08	-0.754	1.225 **	-0.021	0.086	0.2411	1.818	0.012569	66
1998/07-98/09	-0.136	1.263 **	-0.057	0.009	0.2712	1.857	0.012377	66
1998/08-98/10	1.296	1.057 **	0.158 #	-0.014	0.4539	1.795	0.010380	65
1998/09-98/11	-1.041	1.084 **	0.133 *	0.112	0.6333	1.797	0.007217	65
1998/10-98/12	-1.491	1.197 **	0.205 *	-0.046	0.6078	1.850	0.008804	66
1998/11-99/01	-1.593	1.149 **	0.120	-0.251	0.5299	1.841	0.009098	65
1998/12-99/02	-0.307	0.785 **	0.133	0.159	0.4859	1.796	0.009096	64
1999/01-99/03	0.083	0.737 **	0.104	0.071	0.6011	1.423	0.005550	64
1999/02-99/04	0.041	0.840 **	0.063	0.116	0.5258	1.347	0.004461	65
1999/03-99/05	-0.469	0.951 **	0.084	0.014	0.6562	1.655	0.003688	66
1999/04-99/06	-0.956 *	0.889 **	0.053	0.121	0.6585	1.780	0.003719	65
1999/05-99/07	0.233	0.963 **	0.023	-0.071	0.7142	1.623	0.003635	65
1999/06-99/08	-0.049	0.425	0.032	0.275	0.7598	1.717	0.003569	66
1999/07-99/09	0.771	-0.523	0.027	0.818 #	0.8298	1.844	0.003240	66
1999/08-99/10	0.045	0.430	0.052	0.308	0.8728	1.822	0.002460	65
1999/09-99/11	-0.140	0.652	0.017	0.248	0.8512	1.659	0.002755	65
1999/10-99/12	-1.128 *	1.765 *	-0.049	-0.379	0.7149	1.833	0.003567	66
1999/11-00/01	-0.885	2.589 *	0.085	-0.798	0.6569	1.904	0.004849	66
1999/12-00/02	-0.470	1.813 #	0.128	-0.449	0.6737	1.990	0.005111	65
2000/01-00/03	-0.280	0.412	0.113	0.292	0.7666	2.126	0.004335	65
2000/02-00/04	-0.125	0.863 #	0.058	0.073	0.8549	2.143	0.003009	64
2000/03-00/05	0.025	1.024 **	-0.013	0.059	0.9015	1.462	0.002486	66
2000/04-00/06	0.113	1.066 **	-0.002	0.004	0.8745	1.541	0.002694	65
2000/05-00/07	0.094	0.890 **	-0.021	0.094	0.8847	1.609	0.002442	66
2000/06-00/08	-0.277	1.012 **	0.101 *	-0.055	0.9238	1.956	0.001774	66
2000/07-00/09	0.024	0.866 **	0.073	0.047	0.8869	1.781	0.002608	65
2000/08-00/10	0.309	1.081 **	-0.013	-0.018	0.8384	2.145	0.003162	66
2000/09-00/11	1.371 *	0.998 *	0.061	-0.012	0.7040	1.541	0.004648	65
2000/10-00/12	1.419 *	1.077 #	0.235	0.006	0.7367	1.694	0.005083	65
2000/11-01/01	0.709	0.145	0.299 *	0.461	0.7473	1.628	0.005519	66
2000/12-01/02	0.019	0.521	0.186	0.330	0.8072	2.002	0.005224	64
2001/01-01/03	0.308	1.385 *	0.427 **	-0.344	0.7142	2.488	0.005308	65
2001/02-01/04	0.435	2.393 *	0.534 **	-0.892	0.6994	2.204	0.005951	63
2001/03-01/05	0.191	1.707 #	0.621 **	-0.611	0.6989	2.250	0.005408	66
2001/04-01/06	-0.218	0.087	0.522 **	0.267	0.6837	2.161	0.005229	65
2001/05-01/07	-0.310	1.005 #	0.325 **	-0.069	0.7807	2.517	0.003809	66
2001/06-01/08	-0.171	1.298 *	0.202 *	-0.197	0.7774	2.645	0.003547	66
2001/07-01/09	-0.035	1.150 *	0.064	-0.059	0.8231	2.446	0.003806	65
2001/08-01/10	-0.106	1.153 **	0.030	-0.059	0.8537	2.306	0.003141	66
2001/09-01/11	-0.020	1.173 **	-0.098	-0.029	0.8772	1.823	0.003013	65
2001/10-01/12	-0.364	0.860 *	0.329 *	-0.014	0.7952	1.685	0.003520	66
2001/11-02/01	-0.208	0.564	0.394 **	0.090	0.7731	1.876	0.003575	66
2001/12-02/02	0.154	0.101	0.400 **	0.306	0.7764	2.087	0.003286	64
2002/01-02/03	0.186	0.457	0.196 **	0.251	0.8169	2.086	0.002379	64
2002/02-02/04	-0.164	0.617 #	0.143 **	0.137	0.8102	1.557	0.001963	63
2002/03-02/05	-0.962	1.471 **	0.101 #	-0.333	0.7775	2.011	0.002405	66
2002/04-02/06	-1.122 **	1.136 *	0.086	-0.156	0.7217	2.364	0.002966	60

Note: Double asterisks (**), a single asterisk (*) and a pound (#) indicate that the estimated coefficients are statistically significant at the 1%, 5%, and 10% levels, respectively.

Appendix Table (Continued)

(c) Singapore Dollar

Period	Const	USD	JY	EURO	R2-adj	D.W.	Std-res	No. obs.
1996/01-96/03	-0.201	0.610 **	0.180 *	0.337 **	0.7856	1.868	0.002194	65
1996/02-96/04	-0.201	0.642 **	0.034	0.242 **	0.8447	1.738	0.001636	64
1996/03-96/05	-0.105	0.797 **	0.061 *	0.122 **	0.9410	2.061	0.000965	66
1996/04-96/06	0.001	0.847 **	0.069 **	0.074 *	0.9708	2.154	0.000750	65
1996/05-96/07	0.130	0.840 **	0.057 *	0.095 *	0.9719	2.108	0.000892	66
1996/06-96/08	0.010	0.889 **	0.040	0.065	0.9677	2.150	0.000995	65
1996/07-96/09	-0.044	0.885 **	0.052	0.076	0.9656	2.282	0.001087	66
1996/08-96/10	-0.103	0.857 **	0.080 *	0.103 *	0.9563	2.036	0.001008	66
1996/09-96/11	-0.115	0.791 **	0.138 **	0.120 *	0.9621	1.937	0.001022	65
1996/10-96/12	-0.120	0.773 **	0.138 **	0.141 **	0.9708	1.625	0.000921	66
1996/11-97/01	-0.165	0.826 **	0.094 **	0.116 **	0.9790	1.893	0.000891	66
1996/12-97/02	0.072	0.836 **	0.046	0.121 **	0.9476	2.316	0.001367	65
1997/01-97/03	0.346	0.849 **	0.029	0.130 #	0.9033	2.254	0.001931	64
1997/02-97/04	0.281	0.794 **	0.098 #	0.105	0.8778	2.314	0.002085	63
1997/03-97/05	0.059	0.872 **	0.118 **	0.055	0.9388	2.171	0.001819	65
1997/04-97/06	-0.064	0.862 **	0.116 **	0.056	0.9612	2.128	0.001397	65
1997/05-97/07	0.255	0.850 **	0.054	0.063	0.8825	1.550	0.002355	66
1997/06-97/08	0.757	0.812 **	0.071	0.074	0.6014	1.763	0.004104	65
1997/07-97/09	0.986 #	0.812 **	0.054	0.053	0.5864	1.999	0.004430	66
1997/08-97/10	1.165 #	0.777 **	0.070	0.239 #	0.5858	2.032	0.005168	66
1997/09-97/11	0.722	1.005 **	0.039	0.040	0.5579	2.316	0.005978	65
1997/10-97/12	1.293	0.900 **	0.128	0.170	0.5250	2.029	0.006627	66
1997/11-98/01	1.221	0.888 **	0.389 *	-0.163	0.3984	2.086	0.008720	65
1997/12-98/02	0.342	0.644 **	0.502 **	0.237	0.3861	2.171	0.009107	65
1998/01-98/03	-0.763	0.751 **	0.385 *	-0.217	0.2845	2.206	0.009231	64
1998/02-98/04	-1.592 #	0.816 **	0.271 *	-0.302	0.3711	2.076	0.006480	64
1998/03-98/05	0.074	0.588 **	0.285 **	-0.073	0.3667	1.577	0.005242	65
1998/04-98/06	0.471	0.170	0.682 **	0.820 *	0.4939	2.215	0.007185	65
1998/05-98/07	0.313	0.183	0.762 **	0.638 #	0.4798	2.153	0.007884	66
1998/06-98/08	0.665	0.233	0.725 **	0.394	0.5184	2.345	0.007838	66
1998/07-98/09	-0.033	0.571 **	0.429 **	0.441 #	0.5591	2.177	0.007380	66
1998/08-98/10	-0.199	0.749 **	0.264 **	0.333 #	0.6677	1.972	0.006689	65
1998/09-98/11	-0.546	0.658 **	0.254 **	0.476 *	0.6262	1.633	0.006518	65
1998/10-98/12	0.121	0.713 **	0.159 **	0.175	0.8271	1.751	0.003559	66
1998/11-99/01	0.468	0.620 **	0.187 **	0.304 **	0.8828	2.003	0.003186	65
1998/12-99/02	0.759 *	0.874 **	0.112 **	0.105	0.9353	2.221	0.002457	64
1999/01-99/03	0.551	0.880 **	0.121 **	0.157 #	0.9010	2.461	0.002865	64
1999/02-99/04	0.067	0.872 **	0.136 **	0.194 *	0.7173	2.262	0.003423	65
1999/03-99/05	-0.078	0.823 **	0.136 *	0.185 #	0.6898	2.319	0.003516	66
1999/04-99/06	-0.304	0.866 **	0.099 #	0.015	0.6887	2.228	0.003385	65
1999/05-99/07	-0.137	0.941 **	0.040	-0.006	0.8328	2.215	0.002599	65
1999/06-99/08	-0.173	1.271 *	0.104 *	-0.239	0.8178	2.444	0.002662	66
1999/07-99/09	0.164	2.488 **	0.069	-0.863 *	0.8224	2.342	0.002793	66
1999/08-99/10	-0.117	2.228 *	0.060 *	-0.725	0.7859	2.015	0.002961	65
1999/09-99/11	0.002	1.055	0.039	-0.048	0.7999	1.966	0.002918	65
1999/10-99/12	-0.291	1.016 *	0.057	-0.045	0.8333	1.939	0.002505	66
1999/11-00/01	0.171	0.505	0.111 *	0.146	0.8295	2.207	0.002525	66
1999/12-00/02	0.184	0.714	0.122 *	0.032	0.8707	2.341	0.002469	65
2000/01-00/03	0.341	0.849 #	0.126 **	-0.035	0.8626	2.171	0.002622	65
2000/02-00/04	0.051	0.828 *	0.116 **	0.023	0.9107	1.817	0.002152	64
2000/03-00/05	0.165	0.718 **	0.145 **	0.088	0.9307	1.606	0.001903	66
2000/04-00/06	0.112	0.900 **	0.102 **	0.011	0.9314	1.548	0.001838	65
2000/05-00/07	0.206	0.973 **	0.074 *	-0.014	0.9306	1.716	0.001755	66
2000/06-00/08	-0.125	1.201 **	0.055	-0.129	0.9253	1.661	0.001746	66
2000/07-00/09	0.027	1.047 **	0.090 #	-0.078	0.9380	1.862	0.001792	65
2000/08-00/10	0.141	1.138 **	0.081 #	-0.120 #	0.9396	2.112	0.001756	66
2000/09-00/11	0.191	0.917 **	0.132 *	-0.069	0.9204	2.258	0.001866	65
2000/10-00/12	-0.080	0.993 **	0.132 *	-0.109	0.8995	2.283	0.001967	65
2000/11-01/01	-0.179	1.044 **	0.175 **	-0.140	0.9134	2.222	0.002015	66
2000/12-01/02	-0.118	1.313 **	0.129 **	-0.233 *	0.9498	2.214	0.001728	64
2001/01-01/03	0.373	1.403 **	0.172 **	-0.296	0.9427	2.302	0.001745	65
2001/02-01/04	0.521	1.167 **	0.204 **	-0.181	0.9426	2.394	0.001920	63
2001/03-01/05	0.531	0.704 *	0.228 **	0.043	0.9169	2.201	0.002097	66
2001/04-01/06	0.189	0.479 #	0.217 **	0.173	0.9333	1.818	0.001780	65
2001/05-01/07	-0.199	0.864 **	0.182 **	-0.013	0.9056	1.505	0.001978	66
2001/06-01/08	-0.629 **	1.115 **	0.372 **	-0.227	0.8585	1.855	0.002453	66
2001/07-01/09	-0.363	0.971 **	0.303 **	-0.126	0.8303	1.895	0.003256	65
2001/08-01/10	0.265	0.865 **	0.300 **	-0.098	0.7668	1.924	0.003394	66
2001/09-01/11	0.726 *	0.821 **	0.115	0.003	0.8443	1.700	0.002834	65
2001/10-01/12	0.357	0.641 **	0.210 *	0.066	0.8685	1.780	0.002307	66
2001/11-02/01	-0.282	0.751 **	0.294 **	-0.014	0.9209	2.002	0.001759	66
2001/12-02/02	-0.370 #	0.696 **	0.296 **	0.013	0.9316	2.113	0.001547	64
2002/01-02/03	-0.044	0.705 **	0.217 **	0.060	0.8877	2.002	0.001627	64
2002/02-02/04	-0.086	0.534 #	0.217 **	0.144	0.8584	1.905	0.001635	63
2002/03-02/05	-0.051	0.793 **	0.193 **	-0.036	0.8520	2.061	0.001692	66
2002/04-02/06	-0.191	0.615 *	0.213 **	0.034	0.8573	2.100	0.001745	60

Note: Double asterisks (**), a single asterisk (*) and a pound (#) indicate that the estimated coefficients are statistically significant at the 1%, 5%, and 10% levels, respectively.

Appendix Table (Continued)

(d) New Taiwan Dollar

Period	Const	USD	JY	EURO	R2-adj	D.W.	Std-res	No. obs.
1996/01-96/03	-0.098	0.883 **	0.028	0.015	0.7915	2.452	0.002119	65
1996/02-96/04	-0.215	0.882 **	0.004	0.016	0.8061	2.454	0.002040	64
1996/03-96/05	-0.011	0.707 **	0.125 #	0.138	0.6961	2.101	0.002421	66
1996/04-96/06	0.054	0.635 **	0.131 *	0.210 *	0.7518	2.118	0.002292	65
1996/05-96/07	0.290	0.655 **	0.136	0.253 #	0.7539	2.522	0.002857	66
1996/06-96/08	-0.085	0.893 **	0.037	0.078	0.8866	2.702	0.001965	65
1996/07-96/09	-0.019	0.938 **	0.022	0.051	0.9116	2.845	0.001825	66
1996/08-96/10	-0.013	0.979 **	0.044 *	-0.003	0.9884	2.068	0.000524	66
1996/09-96/11	0.010	0.976 **	0.042 **	0.003	0.9916	2.191	0.000498	65
1996/10-96/12	0.018	0.952 **	0.050 **	0.042 *	0.9950	1.952	0.000400	66
1996/11-97/01	-0.116	0.954 **	0.014	0.018	0.9864	1.912	0.000729	66
1996/12-97/02	-0.059	0.954 **	-0.002	0.019	0.9789	1.802	0.000880	65
1997/01-97/03	-0.010	0.968 **	-0.010	0.021	0.9696	2.134	0.001084	64
1997/02-97/04	0.120	0.980 **	0.007	-0.004	0.9772	2.452	0.000933	63
1997/03-97/05	0.274	1.080 **	0.048	-0.184	0.6783	2.884	0.005113	65
1997/04-97/06	0.283	1.067 **	0.055	-0.184	0.6723	2.884	0.005097	65
1997/05-97/07	0.721	1.050 **	0.063	-0.146	0.6255	2.591	0.005400	66
1997/06-97/08	0.453 #	1.014 **	-0.018	0.016	0.8843	0.876	0.002141	65
1997/07-97/09	0.449 #	1.034 **	-0.035	-0.001	0.9016	0.772	0.002079	66
1997/08-97/10	1.250	0.894 **	0.007	0.007	0.4760	1.053	0.006288	66
1997/09-97/11	1.811 #	0.726 **	0.112	0.050	0.2907	1.242	0.008161	65
1997/10-97/12	1.824	0.659 **	0.120	0.036	0.2166	1.321	0.008924	66
1997/11-98/01	1.315	0.845 **	0.080	0.042	0.3162	1.489	0.008132	65
1997/12-98/02	-0.062	0.800 **	0.160	0.011	0.4001	1.414	0.006980	65
1998/01-98/03	0.062	0.796 **	0.209 #	0.068	0.5234	1.255	0.005960	64
1998/02-98/04	-0.646	0.779 **	0.211 **	-0.033	0.6796	1.097	0.003644	64
1998/03-98/05	0.737 #	0.820 **	0.087	0.010	0.6856	2.526	0.003163	65
1998/04-98/06	0.759	0.791 **	0.111	0.494	0.2731	2.747	0.007072	65
1998/05-98/07	0.490	0.867 **	0.100	0.324	0.2629	2.711	0.007082	66
1998/06-98/08	0.287	0.846 **	0.101	0.308	0.4587	2.657	0.006662	66
1998/07-98/09	-0.012	0.986 **	0.035 #	0.002	0.9351	1.648	0.001717	66
1998/08-98/10	-0.644	0.918 **	0.078 **	0.096	0.8845	1.484	0.003090	65
1998/09-98/11	-0.930 *	0.913 **	0.079 **	0.086	0.8800	1.646	0.002922	65
1998/10-98/12	-0.652 #	0.865 **	0.107 **	0.124	0.9093	1.702	0.002717	66
1998/11-99/01	-0.071	0.956 **	0.059 **	-0.004	0.9814	2.194	0.001244	65
1998/12-99/02	0.208	0.857 **	0.022	0.151	0.9219	1.785	0.002580	64
1999/01-99/03	0.326	0.902 **	0.025	0.078	0.8935	1.818	0.002690	64
1999/02-99/04	0.082	0.889 **	0.026	0.087	0.7589	1.733	0.002706	65
1999/03-99/05	-0.129	1.004 **	0.046 *	-0.012	0.9573	1.974	0.001096	66
1999/04-99/06	-0.384 **	0.996 **	0.039 *	0.006	0.9735	1.459	0.000909	65
1999/05-99/07	-0.224 *	0.971 **	0.022	0.040	0.9805	1.694	0.000844	65
1999/06-99/08	-0.348 **	0.855 **	0.041 *	0.049	0.9759	1.760	0.000993	66
1999/07-99/09	-0.232	1.117 **	0.003	-0.069	0.9713	2.538	0.001141	66
1999/08-99/10	-0.216 #	1.278 **	0.003	-0.150	0.9762	2.559	0.000963	65
1999/09-99/11	-0.098	1.164 **	-0.009	-0.080	0.9815	2.934	0.000812	65
1999/10-99/12	-0.220 *	1.134 **	-0.006	-0.070	0.9824	1.711	0.000760	66
1999/11-00/01	-0.648	0.375 **	-0.106 #	0.295	0.7077	2.513	0.003260	66
1999/12-00/02	-0.400	0.039	-0.136 *	0.503	0.7736	2.400	0.003377	65
2000/01-00/03	-0.462	0.423	-0.085	0.293	0.7577	2.453	0.003610	65
2000/02-00/04	-0.017	0.976 **	-0.030	0.030	0.9358	2.378	0.001814	64
2000/03-00/05	0.047	0.918 **	-0.031	0.054	0.9206	2.556	0.001951	66
2000/04-00/06	0.223	0.911 **	-0.032	0.055	0.9485	2.441	0.001539	65
2000/05-00/07	0.216	0.841 **	-0.008	0.075	0.9589	2.549	0.001303	66
2000/06-00/08	0.134	0.881 **	0.011	0.047	0.9758	2.532	0.000954	66
2000/07-00/09	0.250	1.045 **	-0.019	-0.020	0.9746	2.365	0.001112	65
2000/08-00/10	0.649	0.886 **	-0.038	0.071	0.8611	1.277	0.002778	66
2000/09-00/11	0.996 *	0.931 **	-0.038	0.036	0.8084	1.380	0.003294	65
2000/10-00/12	0.946 *	0.745 *	-0.053	0.125	0.7889	1.351	0.003277	65
2000/11-01/01	0.010	0.935 **	0.006	0.026	0.8727	1.845	0.002665	66
2000/12-01/02	-0.368	0.855 **	-0.002	0.075	0.9453	2.313	0.001865	64
2001/01-01/03	-0.222	1.129 **	0.059	-0.110	0.9198	2.133	0.002045	65
2001/02-01/04	0.217	1.474 **	0.080 **	-0.274 *	0.9689	2.312	0.001377	63
2001/03-01/05	0.606	1.868 **	0.021	-0.451 #	0.8251	2.235	0.002983	66
2001/04-01/06	0.717 #	1.138 *	-0.024	-0.061	0.7888	2.281	0.003223	65
2001/05-01/07	0.810 *	1.354 **	-0.118 #	-0.123	0.7868	2.088	0.003217	66
2001/06-01/08	0.244	1.028 **	0.008	-0.002	0.9124	1.613	0.002003	66
2001/07-01/09	-0.038	1.078 **	-0.020	-0.013	0.9560	1.678	0.001704	65
2001/08-01/10	-0.112	1.003 **	0.015	0.002	0.9768	2.334	0.001118	66
2001/09-01/11	-0.010	0.963 **	-0.015	0.034	0.9812	2.398	0.001054	65
2001/10-01/12	0.098	0.868 **	0.074 #	0.026	0.9726	1.505	0.001067	66
2001/11-02/01	0.042	0.778 **	0.110 **	0.054	0.9613	1.985	0.001184	66
2001/12-02/02	0.136	0.770 **	0.109 **	0.052	0.9511	2.011	0.001216	64
2002/01-02/03	0.015	0.715 **	0.078 **	0.126 *	0.9637	2.581	0.000900	64
2002/02-02/04	-0.104	0.710 **	0.068 **	0.141	0.9519	2.535	0.000965	63
2002/03-02/05	-0.270 #	1.123 **	0.075 **	-0.130	0.9322	2.279	0.001239	66
2002/04-02/06	-0.239	1.560 **	0.136 **	-0.379 **	0.9192	2.514	0.001494	60

Note: Double asterisks (**), a single asterisk (*) and a pound (#) indicate that the estimated coefficients are statistically significant at the 1%, 5%, and 10% levels, respectively.

Appendix Table (Continued)

(e) Indonesian Rupiah

Period	Const	USD	JY	EURO	R2-adj	D.W.	Std-res	No. obs.
1996/01-96/03	0.337	1.106 **	-0.043	-0.042	0.8368	2.466	0.002143	65
1996/02-96/04	0.257	1.041 **	-0.014	-0.021	0.8399	2.470	0.002080	64
1996/03-96/05	0.137	1.026 **	-0.009	0.022	0.9480	2.035	0.001018	66
1996/04-96/06	-0.085	0.987 **	-0.009	-0.001	0.9563	1.854	0.000967	65
1996/05-96/07	0.166	0.949 **	-0.005	0.043	0.8860	2.350	0.001957	66
1996/06-96/08	0.087	0.918 **	0.040	0.041	0.8798	2.302	0.002037	65
1996/07-96/09	-0.035	0.943 **	0.034	0.025	0.8733	2.157	0.002223	66
1996/08-96/10	-0.180	0.937 **	0.038	0.026	0.9279	1.598	0.001311	66
1996/09-96/11	-0.014	0.996 **	-0.037	0.003	0.9491	1.582	0.001223	65
1996/10-96/12	0.240 **	1.023 **	-0.039 *	-0.026	0.9887	1.757	0.000594	66
1996/11-97/01	0.353 **	1.015 **	-0.003	0.017	0.9780	1.619	0.000980	66
1996/12-97/02	0.361 *	1.006 **	0.011	0.001	0.9678	1.800	0.001150	65
1997/01-97/03	0.292 #	1.023 **	0.004	0.019	0.9670	2.002	0.001203	64
1997/02-97/04	0.334 #	0.975 **	0.030	0.019	0.9497	2.100	0.001429	63
1997/03-97/05	0.196	1.000 **	0.019	0.041	0.9667	2.027	0.001456	65
1997/04-97/06	0.205	0.997 **	0.021	0.040	0.9674	2.022	0.001417	65
1997/05-97/07	1.351	1.050 **	0.130	-0.133	0.4837	2.058	0.007348	66
1997/06-97/08	2.807	1.178 **	0.362	-0.891 #	0.1602	1.510	0.016127	65
1997/07-97/09	4.569 #	0.723	0.293	-0.610	0.0448	1.536	0.018647	66
1997/08-97/10	4.681	0.900 #	0.253	-0.551	0.0438	1.689	0.022541	66
1997/09-97/11	3.354	1.463 *	-0.077	-0.100	0.0863	1.905	0.023370	65
1997/10-97/12	5.270	1.913	-0.731	-0.039	-0.0049	1.762	0.047121	66
1997/11-98/01	18.471	2.980	1.706	-3.085	0.0203	1.846	0.090207	65
1997/12-98/02	15.686	0.075	3.778 *	-2.277	0.0396	1.880	0.097554	65
1998/01-98/03	10.436	-1.123	5.528 **	-1.895	0.1183	1.613	0.088583	64
1998/02-98/04	-6.523	-2.951 *	2.944 **	-0.055	0.1681	1.797	0.045455	64
1998/03-98/05	0.265	-1.584	2.069 #	-1.159	0.0093	2.355	0.064019	65
1998/04-98/06	9.025	-0.780	0.100	2.535	-0.0376	2.457	0.066767	65
1998/05-98/07	7.788	-0.937	-0.125	0.543	-0.0448	2.419	0.067745	66
1998/06-98/08	0.205	-0.601	-0.260	1.720	-0.0241	1.782	0.035084	66
1998/07-98/09	-4.617	0.765	0.112	0.080	0.0021	1.821	0.026168	66
1998/08-98/10	-8.249 *	1.114 *	0.379	1.423 #	0.2976	2.078	0.027497	65
1998/09-98/11	-5.687	0.818	0.172	2.117 *	0.2227	1.863	0.029594	65
1998/10-98/12	-3.369	0.174	0.355	1.753 #	0.1546	2.066	0.029402	66
1998/11-99/01	2.161	0.501	0.049	0.448	0.0502	1.946	0.024037	65
1998/12-99/02	3.215	1.086 #	0.352	-0.415	0.1891	2.430	0.019004	64
1999/01-99/03	1.337	0.869 #	0.316	0.354	0.2491	2.067	0.018137	64
1999/02-99/04	-1.924	0.732 #	0.138	0.808 *	0.2525	1.786	0.012604	65
1999/03-99/05	-1.336	0.672	0.196	0.982 **	0.2612	2.117	0.013092	66
1999/04-99/06	-3.969 #	1.137 *	0.171	0.209	0.1246	2.181	0.016715	65
1999/05-99/07	-2.502	1.223 **	-0.017	-0.198	0.1053	2.199	0.017376	65
1999/06-99/08	-0.915	-4.309	0.072	2.714	0.0823	1.755	0.020867	66
1999/07-99/09	4.056	1.561	0.606 #	-0.560	0.0905	1.680	0.021072	66
1999/08-99/10	1.183	0.471	0.833 *	-0.174	0.0636	1.430	0.024531	65
1999/09-99/11	-0.396	2.242	0.393	-0.875	0.0517	1.279	0.020757	65
1999/10-99/12	-2.849	0.452	0.223	-0.048	0.0025	1.131	0.015968	66
1999/11-00/01	1.306	1.837	-0.063	-0.391	0.2776	1.975	0.009219	66
1999/12-00/02	0.399	4.058 #	-0.025	-1.469	0.3666	1.999	0.009791	65
2000/01-00/03	1.090	2.589	0.055	-0.742	0.4455	2.150	0.009302	65
2000/02-00/04	0.675	2.937 #	0.051	-0.968	0.3808	1.996	0.009792	64
2000/03-00/05	2.604 *	-0.524	0.243	0.779	0.4406	2.163	0.009644	66
2000/04-00/06	2.320 #	0.085	0.036	0.533	0.3566	2.067	0.010495	65
2000/05-00/07	1.593	0.532	0.207	0.339	0.3425	1.989	0.012200	66
2000/06-00/08	-0.581	4.430 **	-0.054	-1.415	0.4096	1.984	0.011714	66
2000/07-00/09	0.018	3.867 **	0.118	-1.260	0.4245	2.059	0.012359	65
2000/08-00/10	0.951	2.651 **	-0.043	-0.655	0.4185	2.143	0.010658	66
2000/09-00/11	1.866 #	1.448 *	0.192	-0.335	0.3636	2.331	0.008685	65
2000/10-00/12	0.972	0.801	0.439 #	-0.041	0.4101	2.204	0.008541	65
2000/11-01/01	-0.101	1.358	0.123	-0.190	0.4478	2.348	0.008346	66
2000/12-01/02	0.506	1.193	-0.103	0.033	0.5463	2.325	0.007978	64
2001/01-01/03	1.375	1.866	-0.041	-0.328	0.4364	1.886	0.009195	65
2001/02-01/04	3.762 *	1.875	-0.009	-0.149	0.4954	1.669	0.011955	63
2001/03-01/05	2.479	2.591	0.496 *	-0.631	0.4470	1.589	0.013428	66
2001/04-01/06	1.882	-0.249	0.574 *	0.688	0.4293	1.647	0.012610	65
2001/05-01/07	-3.348 #	2.845	0.295	-0.992	0.1612	1.687	0.015236	66
2001/06-01/08	-3.347	4.830 #	-0.873 *	-1.545	0.2024	1.351	0.016860	66
2001/07-01/09	-3.023	1.832	-0.558	-0.101	0.2351	1.358	0.017896	65
2001/08-01/10	1.257	0.879	0.043	0.235	0.2526	1.632	0.015231	66
2001/09-01/11	2.456 #	0.286	0.350	0.412	0.3785	1.688	0.011126	65
2001/10-01/12	0.504	-0.278	0.454	0.604	0.3251	1.565	0.010415	66
2001/11-02/01	-0.554	0.349	0.251	0.217	0.3479	1.587	0.007815	66
2001/12-02/02	-0.729	0.516	0.191	0.144	0.5211	1.659	0.005078	64
2002/01-02/03	-0.900	0.628	0.050	0.119	0.4146	1.657	0.004697	64
2002/02-02/04	-1.463 #	0.736	-0.024	0.066	0.2295	2.045	0.006152	63
2002/03-02/05	-2.342 **	1.134	-0.076	-0.065	0.3595	2.052	0.006514	66
2002/04-02/06	-2.185 #	-0.464 **	0.053	0.737	0.2178	1.778	0.008527	60

Note: Double asterisks (**), a single asterisk (*) and a pound (#) indicate that the estimated coefficients are statistically significant at the 1%, 5%, and 10% levels, respectively.

Appendix Table (Continued)

(f) Malaysian Ringgit

Period	Const	USD	JY	EURO	R2-adj	D.W.	Std-res	No. obs.
1996/01-96/03	-0.104	0.862 **	0.138 **	0.183 **	0.9087	1.751	0.001509	65
1996/02-96/04	-0.369 #	0.876 **	0.064	0.148 *	0.8775	2.107	0.001743	64
1996/03-96/05	-0.350 #	0.864 **	-0.023	0.136 #	0.8500	2.023	0.001673	66
1996/04-96/06	-0.255	0.873 **	0.007	0.072	0.8746	2.071	0.001620	65
1996/05-96/07	0.083	0.923 **	-0.030	0.048	0.9589	2.400	0.001089	66
1996/06-96/08	0.008	0.935 **	0.012	0.015	0.9786	2.059	0.000803	65
1996/07-96/09	0.071	0.945 **	-0.015	0.016	0.9816	2.036	0.000774	66
1996/08-96/10	0.144	0.985 **	-0.002	-0.039	0.9533	1.912	0.001019	66
1996/09-96/11	0.118	0.929 **	0.040	-0.020	0.9579	2.024	0.001063	65
1996/10-96/12	0.088	0.886 **	0.081 *	0.046	0.9678	1.825	0.000988	66
1996/11-97/01	-0.353	0.895 **	0.087 #	0.004	0.9193	2.202	0.001794	66
1996/12-97/02	-0.400	0.893 **	0.049	0.044	0.8997	2.221	0.001961	65
1997/01-97/03	-0.410	0.900 **	0.048	0.027	0.8888	2.204	0.002091	64
1997/02-97/04	0.033	0.840 **	0.021	0.148 **	0.9410	1.865	0.001457	63
1997/03-97/05	0.155	0.793 **	0.011	0.210 **	0.9170	1.765	0.002121	65
1997/04-97/06	0.206	0.834 **	-0.002	0.169 *	0.9174	1.922	0.002110	65
1997/05-97/07	0.443	0.742 **	-0.088	0.246	0.6468	1.935	0.004566	66
1997/06-97/08	2.329 **	1.090 **	-0.070	-0.220	0.4104	1.359	0.006933	65
1997/07-97/09	4.018 **	1.089 **	-0.156	-0.175	0.2979	1.533	0.008848	66
1997/08-97/10	4.175 *	0.955 **	-0.176	0.125	0.1442	1.634	0.013391	66
1997/09-97/11	3.087	1.420 **	-0.309	-0.097	0.1396	1.853	0.016360	65
1997/10-97/12	2.672	1.338 **	0.039	-0.014	0.1848	1.893	0.016795	66
1997/11-98/01	3.847	1.725 **	0.485	-0.497	0.2246	1.273	0.020895	65
1997/12-98/02	1.308	1.025 #	1.127 **	-0.011	0.2109	1.522	0.023513	65
1998/01-98/03	-0.967	0.909	1.040 *	-0.715	0.0917	1.641	0.026334	64
1998/02-98/04	-3.136	1.061 #	0.931 *	-1.441	0.1147	2.240	0.020542	64
1998/03-98/05	-0.309	0.365	0.693 *	-0.162	0.0725	2.324	0.015947	65
1998/04-98/06	1.865	0.382	0.743 **	0.821	0.2996	1.937	0.011703	65
1998/05-98/07	0.615	0.236	0.777 **	0.316	0.3032	1.811	0.010927	66
1998/06-98/08	1.218	0.187	0.631 **	0.222	0.3567	1.970	0.008952	66
1998/07-98/09	-1.293	0.672 *	0.244 #	0.299	0.2641	1.780	0.010769	66
1998/08-98/10	-1.104	0.837 **	0.052	0.308	0.4483	1.292	0.009446	65
1998/09-98/11	-1.393	0.940 **	0.035	0.289	0.4880	0.906	0.008758	65
1998/10-98/12	0.001	0.999 **	0.000	0.001	1.0000	2.873	0.000031	66
1998/11-99/01	-0.003	0.997 **	0.001	0.009	0.9987	2.527	0.000330	65
1998/12-99/02	0.013	1.018 **	-0.001	-0.015	0.9967	2.575	0.000523	64
1999/01-99/03	-0.003	1.003 **	-0.001	0.009	0.9950	2.636	0.000576	64
1999/02-99/04	0.012	1.011 **	-0.001	0.005	0.9917	2.610	0.000467	65
1999/03-99/05	-0.007	0.989 **	0.001	0.017 **	0.9981	2.767	0.000223	66
1999/04-99/06	0.000	1.000 **	0.000	0.001 *	1.0000	2.252	0.000013	65
1999/05-99/07	0.000	1.000 **	0.000	0.001 *	1.0000	2.191	0.000013	65
1999/06-99/08	-0.001	1.005 **	-0.001	-0.003	0.9999	2.878	0.000060	66
1999/07-99/09	0.001	1.018 **	0.000	-0.011	0.9999	2.871	0.000060	66
1999/08-99/10	-0.001	0.990 **	-0.001	0.005	0.9999	3.003	0.000045	65
1999/09-99/11	-0.001	1.006 **	0.000	-0.004	1.0000	3.240	0.000021	65
1999/10-99/12	0.000	1.007 **	0.000	-0.003	1.0000	3.127	0.000023	66
1999/11-00/01	-0.001	1.005 **	0.000	-0.003	1.0000	3.198	0.000019	66
1999/12-00/02	0.000	1.003 **	0.000	-0.001	1.0000	3.392	0.000015	65
2000/01-00/03	-0.001	1.000 **	0.000	0.000	1.0000	1.148	0.000003	65
2000/02-00/04	0.000	1.000 **	0.000 #	0.000 *	1.0000	2.656	0.000000	64
2000/03-00/05	0.000	1.000 **	0.000	0.000	1.0000	3.039	0.000000	66
2000/04-00/06	0.000	1.000 **	0.000	0.000	1.0000	2.955	0.000000	65
2000/05-00/07	0.000	1.000 **	0.000	0.000	1.0000	3.110	0.000000	66
2000/06-00/08	0.000	1.000 **	0.000	0.000	1.0000	3.057	0.000000	66
2000/07-00/09	0.000	1.000 **	0.000	0.000	1.0000	3.135	0.000000	65
2000/08-00/10	0.000	1.000 **	0.000	0.000	1.0000	2.870	0.000000	66
2000/09-00/11	0.000	1.000 **	0.000	0.000	1.0000	2.752	0.000000	65
2000/10-00/12	0.000	1.000 **	0.000	0.000	1.0000	2.815	0.000000	65
2000/11-01/01	0.000	1.000 **	0.000	0.000	1.0000	2.759	0.000000	66
2000/12-01/02	0.000	1.000 **	0.000	0.000	1.0000	2.772	0.000000	64
2001/01-01/03	0.000	1.000 **	0.000	0.000	1.0000	2.852	0.000000	65
2001/02-01/04	0.000	1.000 **	0.000	0.000	1.0000	3.001	0.000000	63
2001/03-01/05	0.000	1.000 **	0.000	0.000 #	1.0000	3.027	0.000000	66
2001/04-01/06	0.000	1.000 **	0.000 **	0.000	1.0000	3.156	0.000000	65
2001/05-01/07	0.000	1.000 **	0.000	0.000	1.0000	3.284	0.000000	66
2001/06-01/08	0.000	1.000 **	0.000	0.000	1.0000	2.942	0.000000	66
2001/07-01/09	0.000	1.000 **	0.000	0.000	1.0000	2.895	0.000000	65
2001/08-01/10	0.000	1.000 **	0.000	0.000	1.0000	2.869	0.000000	66
2001/09-01/11	0.000	1.000 **	0.000	0.000	1.0000	2.925	0.000000	65
2001/10-01/12	0.000	1.000 **	0.000	0.000	1.0000	2.911	0.000000	66
2001/11-02/01	0.000	1.000 **	0.000	0.000	1.0000	2.901	0.000000	66
2001/12-02/02	0.000	1.000 **	0.000	0.000	1.0000	2.768	0.000000	64
2002/01-02/03	0.000	1.000 **	0.000	0.000	1.0000	2.797	0.000000	64
2002/02-02/04	0.000	1.000 **	0.000	0.000	1.0000	2.871	0.000000	63
2002/03-02/05	0.000	1.000 **	0.000	0.000	1.0000	3.042	0.000000	66
2002/04-02/06	0.000	1.000 **	0.000	0.000	1.0000	2.990	0.000000	60

Note: Double asterisks (**), a single asterisk (*) and a pound (#) indicate that the estimated coefficients are statistically significant at the 1%, 5%, and 10% levels, respectively.

Appendix Table (Continued)

(g) Philippines Peso

Period	Const	USD	JY	EURO	R2-adj	D.W.	Std-res	No. obs.
1996/01-96/03	0.023	1.023 **	-0.015	-0.006	0.9722	2.304	0.000783	65
1996/02-96/04	0.000	1.024 **	0.004	-0.002	0.9876	1.707	0.000536	64
1996/03-96/05	0.015	0.998 **	-0.015	0.003	0.9903	1.968	0.000413	66
1996/04-96/06	-0.010	1.014 **	-0.018	-0.021	0.9883	2.066	0.000497	65
1996/05-96/07	0.045	1.021 **	-0.021	-0.034	0.9929	2.127	0.000470	66
1996/06-96/08	0.009	1.005 **	-0.008	-0.007	0.9931	2.006	0.000475	65
1996/07-96/09	0.023	0.994 **	0.001	-0.001	0.9952	2.036	0.000414	66
1996/08-96/10	0.015	0.990 **	0.012	-0.005	0.9930	2.042	0.000403	66
1996/09-96/11	0.032	1.005 **	0.000	-0.014	0.9942	1.892	0.000412	65
1996/10-96/12	0.035	0.998 **	-0.004	0.004	0.9961	1.941	0.000352	66
1996/11-97/01	0.042	0.998 **	-0.007	0.016	0.9964	1.673	0.000386	66
1996/12-97/02	0.035	0.996 **	0.001	0.010	0.9972	1.908	0.000332	65
1997/01-97/03	0.040	0.999 **	-0.004	0.008	0.9970	2.035	0.000346	64
1997/02-97/04	0.006	0.992 **	0.003	0.005	0.9976	2.556	0.000302	63
1997/03-97/05	0.023	1.011 **	-0.002	-0.009	0.9981	2.466	0.000331	65
1997/04-97/06	0.007	1.004 **	0.002	0.003	0.9984	2.424	0.000306	65
1997/05-97/07	0.892	0.198	-0.295	0.649	0.0563	1.295	0.014258	66
1997/06-97/08	1.647	0.380	-0.029	-0.152	-0.0318	1.497	0.016089	65
1997/07-97/09	3.967 #	0.267	0.308	-0.348	-0.0124	1.763	0.018857	66
1997/08-97/10	1.826	0.909 *	0.483 #	-0.205	0.2002	2.041	0.015833	66
1997/09-97/11	1.752	0.865 #	0.286	-0.188	0.1188	1.963	0.016314	65
1997/10-97/12	2.146	0.860 #	0.095	0.019	0.0608	1.359	0.018436	66
1997/11-98/01	3.219	1.016 #	0.392	-0.048	0.1153	1.258	0.019988	65
1997/12-98/02	2.664	0.874 #	0.953 **	-0.204	0.1975	1.266	0.019928	65
1998/01-98/03	-0.489	1.109 *	0.876 **	-0.248	0.2993	1.418	0.015934	64
1998/02-98/04	-1.667	1.345 **	0.688 **	-0.778	0.2804	2.063	0.013908	64
1998/03-98/05	-0.757	1.325 **	0.288	-0.170	0.2547	2.281	0.012295	65
1998/04-98/06	1.640	0.685	0.383 *	1.225 #	0.1840	2.340	0.013616	65
1998/05-98/07	0.380	0.476	0.250 #	0.510	0.0926	2.313	0.010424	66
1998/06-98/08	1.591	0.516 #	0.346 *	0.709	0.2861	2.237	0.010688	66
1998/07-98/09	0.402	1.000 **	0.225 *	0.081	0.5322	1.665	0.007322	66
1998/08-98/10	-0.383	1.022 **	0.167 *	0.085	0.6208	1.604	0.007639	65
1998/09-98/11	-1.430	1.076 **	0.148 *	-0.030	0.6214	2.089	0.007045	65
1998/10-98/12	-1.405 #	1.089 **	0.122 #	-0.226	0.6481	2.075	0.006533	66
1998/11-99/01	-0.536	0.930 **	0.339 **	-0.376	0.6443	2.331	0.006621	65
1998/12-99/02	-0.003	0.783 **	0.264 **	-0.092	0.6547	1.874	0.006136	64
1999/01-99/03	-0.298	0.767 **	0.248 **	-0.026	0.6419	1.904	0.005649	64
1999/02-99/04	-0.136	0.944 **	0.147 *	0.036	0.5786	1.838	0.004426	65
1999/03-99/05	-0.381	0.903 **	0.133 *	-0.059	0.7383	2.351	0.002914	66
1999/04-99/06	-0.252	1.015 **	0.063	-0.125	0.8036	2.138	0.002700	65
1999/05-99/07	0.183	0.994 **	0.006	0.037	0.8116	1.915	0.002899	65
1999/06-99/08	0.800 *	0.164	0.101 #	0.339	0.8371	2.080	0.002571	66
1999/07-99/09	1.176 *	0.839	0.031	0.048	0.7237	2.246	0.003934	66
1999/08-99/10	0.642	1.826	0.003	-0.451	0.5621	2.023	0.005289	65
1999/09-99/11	0.486	1.896	-0.034	-0.424	0.5993	2.020	0.005114	65
1999/10-99/12	-0.251	1.397 #	-0.039	-0.187	0.6535	1.956	0.004133	66
1999/11-00/01	0.095	1.506 *	0.081	-0.313	0.7482	2.146	0.003431	66
1999/12-00/02	-0.200	1.407 *	0.156 *	-0.304	0.8212	2.283	0.003191	65
2000/01-00/03	0.281	1.243 *	0.062	-0.161	0.8272	2.134	0.003226	65
2000/02-00/04	0.263	1.110 **	-0.018	-0.047	0.9592	2.029	0.001424	64
2000/03-00/05	0.652 #	0.670 *	0.008	0.151	0.8565	1.009	0.002667	66
2000/04-00/06	0.812 *	0.673 *	0.022	0.131	0.8400	1.053	0.002780	65
2000/05-00/07	1.347 **	0.712	-0.022	0.124	0.7013	1.608	0.003918	66
2000/06-00/08	0.869 *	1.032 *	-0.034	0.019	0.7887	1.976	0.003282	66
2000/07-00/09	1.085 *	0.955 **	-0.067	0.066	0.8178	2.020	0.003328	65
2000/08-00/10	1.990 **	0.618	-0.001	0.187	0.6735	1.403	0.004816	66
2000/09-00/11	1.721	0.197	-0.143	0.444	0.2891	2.203	0.010153	65
2000/10-00/12	1.713	-0.664	-0.361	0.936	0.2716	2.191	0.010219	65
2000/11-01/01	-1.630	0.273	0.317	0.438	0.2286	2.107	0.017520	66
2000/12-01/02	-0.861	1.502	0.248	-0.143	0.3261	1.968	0.015618	64
2001/01-01/03	0.021	2.239	0.226	-0.491	0.2967	1.943	0.015560	65
2001/02-01/04	0.867	1.474 #	0.041	-0.196	0.7587	2.079	0.004829	63
2001/03-01/05	0.714	0.005	0.110	0.431	0.6512	2.165	0.004915	66
2001/04-01/06	0.949 #	-0.743	0.245 **	0.769 *	0.7173	1.990	0.004290	65
2001/05-01/07	0.689	-0.043	0.242 *	0.413	0.6531	1.861	0.004411	66
2001/06-01/08	0.232	1.478 *	0.275 *	-0.425	0.5974	1.342	0.004415	66
2001/07-01/09	-0.245	1.202 **	0.131	-0.191	0.7348	1.302	0.004299	65
2001/08-01/10	-0.462	1.213 **	0.131	-0.195	0.7743	1.367	0.003620	66
2001/09-01/11	0.280	0.980 **	0.011	0.007	0.9414	2.403	0.001861	65
2001/10-01/12	0.040	0.953 **	0.014	0.001	0.8449	2.037	0.002712	66
2001/11-02/01	-0.281	0.873 **	0.040	0.034	0.8188	2.166	0.002757	66
2001/12-02/02	-0.278	0.722 *	0.042	0.106	0.7918	2.154	0.002689	64
2002/01-02/03	-0.166	0.524 *	0.082 *	0.201	0.8402	2.821	0.001933	64
2002/02-02/04	-0.118	0.376	0.062	0.289 #	0.8299	2.731	0.001802	63
2002/03-02/05	-0.153	0.948 #	0.026	-0.043	0.6660	2.028	0.003115	66
2002/04-02/06	-0.078	0.973	-0.069	-0.025	0.6658	1.623	0.003419	60

Note: Double asterisks (**), a single asterisk (*) and a pound (#) indicate that the estimated coefficients are statistically significant at the 1%, 5%, and 10% levels, respectively.

Appendix Table (Continued)

(h) Thai Baht

Period	Const	USD	JY	EURO	R2-adj	D.W.	Std-res	No. obs.
1996/01-96/03	-0.009	0.890 **	0.063 #	0.065	0.9426	2.316	0.001083	65
1996/02-96/04	-0.036	0.887 **	0.055	0.087 #	0.9431	2.476	0.001110	64
1996/03-96/05	0.068	0.916 **	0.037	0.105 *	0.9461	2.658	0.001013	66
1996/04-96/06	0.088	0.934 **	0.042 *	0.048	0.9736	2.431	0.000751	65
1996/05-96/07	0.054	0.852 **	0.058 *	0.122 *	0.9713	2.666	0.000928	66
1996/06-96/08	-0.015	0.847 **	0.120 **	0.088 #	0.9752	2.714	0.000888	65
1996/07-96/09	0.005	0.889 **	0.072 *	0.065	0.9726	2.459	0.000976	66
1996/08-96/10	0.131	0.963 **	0.034	0.031	0.9838	2.563	0.000621	66
1996/09-96/11	0.091	0.890 **	0.049 *	0.061 #	0.9843	2.778	0.000655	65
1996/10-96/12	0.147 #	0.874 **	0.073 **	0.076 **	0.9848	2.158	0.000676	66
1996/11-97/01	0.123	0.860 **	0.095 **	0.084 **	0.9827	2.132	0.000820	66
1996/12-97/02	0.105	0.850 **	0.112 **	0.087 **	0.9787	1.957	0.000889	65
1997/01-97/03	-0.013	0.834 **	0.099 **	0.083 **	0.9814	1.956	0.000816	64
1997/02-97/04	-0.011	0.815 **	0.101 **	0.078 **	0.9874	1.985	0.000638	63
1997/03-97/05	-0.597	0.871 **	0.297 *	-0.053	0.5920	1.937	0.005798	65
1997/04-97/06	-0.370	0.780 *	0.420	0.412	0.2304	2.029	0.015178	65
1997/05-97/07	1.945	-0.108	-0.040	1.641 #	0.0498	1.975	0.027020	66
1997/06-97/08	4.804	0.687	0.021	0.890	0.0110	2.006	0.027541	65
1997/07-97/09	5.794 #	0.548	-0.121	0.061	-0.0312	2.000	0.025349	66
1997/08-97/10	3.402 #	1.011 **	0.162	-0.360	0.1324	2.276	0.015976	66
1997/09-97/11	2.926	1.066 *	-0.118	-0.273	0.0599	2.104	0.017146	65
1997/10-97/12	4.232 #	0.771	0.187	-0.013	0.0624	2.083	0.018082	66
1997/11-98/01	3.789	0.498	0.706 #	-0.404	0.0667	1.612	0.020796	65
1997/12-98/02	1.336	0.502	1.087 *	-0.257	0.1132	1.648	0.023928	65
1998/01-98/03	-3.458	0.421	0.846 #	-0.710	0.0337	1.672	0.024130	64
1998/02-98/04	-5.727 *	0.569	0.598	-0.772	0.0251	1.821	0.019430	64
1998/03-98/05	-1.409	0.044	0.297	0.323	-0.0054	1.871	0.014450	65
1998/04-98/06	0.749	0.686 #	0.682 **	0.396	0.3039	1.942	0.010698	65
1998/05-98/07	0.042	0.210	0.630 **	0.142	0.2702	1.958	0.009397	66
1998/06-98/08	0.354	0.368	0.669 **	0.209	0.4246	1.624	0.008776	66
1998/07-98/09	-1.088	0.536 **	0.260 **	0.638 *	0.4875	1.846	0.007462	66
1998/08-98/10	-1.237	0.896 **	0.174 **	0.251	0.6210	1.834	0.007449	65
1998/09-98/11	-1.960 *	0.819 **	0.132 *	0.374 *	0.6105	1.801	0.006696	65
1998/10-98/12	-0.706	0.956 **	0.092	0.024	0.7158	1.934	0.005527	66
1998/11-99/01	-0.050	0.595 **	0.246 *	0.297	0.5532	2.544	0.007933	65
1998/12-99/02	0.523	0.703 **	0.204 *	0.195	0.5711	2.560	0.007779	64
1999/01-99/03	0.195	0.740 **	0.184 *	0.109	0.5111	2.700	0.007383	64
1999/02-99/04	0.191	0.981 **	0.095 #	0.086	0.6841	1.954	0.003679	65
1999/03-99/05	-0.066	0.953 **	0.127 #	0.038	0.6726	2.194	0.003745	66
1999/04-99/06	-0.339	0.895 **	0.092	0.086	0.7228	2.122	0.003287	65
1999/05-99/07	0.043	0.890 **	0.026	-0.018	0.7494	2.166	0.003122	65
1999/06-99/08	0.599	0.773	0.057	0.055	0.7858	2.000	0.003087	66
1999/07-99/09	1.761 *	0.707	0.066	0.066	0.5465	2.025	0.005329	66
1999/08-99/10	0.581	0.691	0.037	0.075	0.2648	1.847	0.008325	65
1999/09-99/11	0.230	0.982	0.029	-0.044	0.2760	1.824	0.008303	65
1999/10-99/12	-1.473 #	1.610	0.057	-0.457	0.2736	1.884	0.006948	66
1999/11-00/01	-0.737	2.337 *	0.258 **	-0.903 #	0.5988	2.094	0.004413	66
1999/12-00/02	-0.845	1.762 *	0.367 **	-0.641	0.7004	2.424	0.004324	65
2000/01-00/03	0.072	0.853	0.164 *	-0.022	0.7359	2.300	0.004241	65
2000/02-00/04	0.296	0.912 *	0.025	0.048	0.8581	2.156	0.002880	64
2000/03-00/05	0.475	0.780 *	0.044	0.094	0.8115	2.249	0.003240	66
2000/04-00/06	0.523	1.000 **	0.068	-0.036	0.8134	2.154	0.003135	65
2000/05-00/07	1.218 **	0.730 #	0.166 *	0.042	0.7391	2.239	0.003674	66
2000/06-00/08	0.678	1.098 *	0.237 **	-0.122	0.7537	2.107	0.003869	66
2000/07-00/09	1.076 #	0.683	0.244 #	0.046	0.7123	2.102	0.004723	65
2000/08-00/10	1.012	1.172 **	0.121	-0.110	0.6871	2.194	0.005092	66
2000/09-00/11	1.063	0.748	0.056	0.051	0.5810	2.259	0.005295	65
2000/10-00/12	0.355	1.225 *	0.167	-0.236	0.5360	1.861	0.005432	65
2000/11-01/01	-0.770	0.624	0.316 *	0.009	0.6455	1.701	0.004908	66
2000/12-01/02	-0.453	1.147 *	0.283 **	-0.221	0.7675	1.387	0.004244	64
2001/01-01/03	0.152	1.167 **	0.308 **	-0.227	0.8393	1.810	0.003290	65
2001/02-01/04	0.975 **	1.439 **	0.283 **	-0.305	0.9211	2.140	0.002519	63
2001/03-01/05	0.844 *	1.015 *	0.256 **	-0.081	0.8966	2.268	0.002563	66
2001/04-01/06	0.177	-0.252	0.150 **	0.587 **	0.8882	2.178	0.002462	65
2001/05-01/07	0.123	0.223	0.038	0.364 *	0.8795	2.348	0.002185	66
2001/06-01/08	-0.477	0.572	0.144 *	0.160	0.8531	2.338	0.002558	66
2001/07-01/09	-0.303	1.118 **	0.134 *	-0.105	0.8915	1.984	0.002691	65
2001/08-01/10	-0.349	1.051 **	0.169 *	-0.092	0.8712	2.091	0.002684	66
2001/09-01/11	-0.149	1.050 **	0.096	-0.062	0.9093	1.825	0.002342	65
2001/10-01/12	-0.388 #	0.903 **	0.236 **	-0.025	0.9434	1.813	0.001641	66
2001/11-02/01	-0.517 *	0.898 **	0.264 **	-0.036	0.9453	1.814	0.001557	66
2001/12-02/02	-0.420 *	0.654 **	0.295 **	0.055	0.9476	1.753	0.001386	64
2002/01-02/03	-0.261	0.492 **	0.208 **	0.171 #	0.9113	1.952	0.001421	64
2002/02-02/04	-0.187	0.457 *	0.201 **	0.207 #	0.9103	1.992	0.001294	63
2002/03-02/05	-0.287	1.087 **	0.141 **	-0.132	0.8842	1.765	0.001635	66
2002/04-02/06	-0.310	1.148	0.109 *	0.161	0.8876	1.782	0.001653	60

Note: Double asterisks (**), a single asterisk (*) and a pound (#) indicate that the estimated coefficients are statistically significant at the 1%, 5%, and 10% levels, respectively.

Appendix Table (Continued)

(i) Chinese Ren Min Bi

Period	Const	USD	JY	EURO	R2-adj	D.W.	Std-res	No. obs.
1996/01-96/03	0.108	1.049 **	-0.064	0.077	0.8078	2.664	0.002337	65
1996/02-96/04	0.021	1.037 **	0.066	0.029	0.7497	2.689	0.002910	64
1996/03-96/05	0.084	0.974 **	0.022	-0.033	0.7126	2.826	0.002541	66
1996/04-96/06	-0.043	1.010 **	0.011	-0.052	0.7657	2.912	0.002470	65
1996/05-96/07	0.092	1.050 **	-0.033	-0.049	0.9600	1.438	0.001151	66
1996/06-96/08	-0.022	1.063 **	-0.043 *	-0.017	0.9910	2.142	0.000559	65
1996/07-96/09	-0.019	1.020 **	0.000	-0.013 *	0.9996	1.940	0.000120	66
1996/08-96/10	0.007	1.008 **	-0.040	0.019	0.9664	2.924	0.000893	66
1996/09-96/11	-0.016	0.969 **	-0.049	0.060	0.9454	2.924	0.001272	65
1996/10-96/12	0.013	1.140 **	-0.107 #	-0.076	0.9179	2.801	0.001744	66
1996/11-97/01	0.060	1.073 **	-0.039	-0.037	0.9485	2.960	0.001530	66
1996/12-97/02	0.085	1.073 **	-0.022	-0.038	0.9651	2.973	0.001230	65
1997/01-97/03	-0.009	0.997 **	0.001	-0.002	0.9997	2.637	0.000112	64
1997/02-97/04	0.020	1.013 **	-0.002	-0.052 *	0.9905	2.826	0.000601	63
1997/03-97/05	0.021	1.023 **	-0.001	-0.054 *	0.9940	2.821	0.000589	65
1997/04-97/06	-0.012	1.018 **	0.004	-0.050 *	0.9915	2.505	0.000692	65
1997/05-97/07	-0.059	1.003 **	-0.002	-0.009	0.9944	2.493	0.000536	66
1997/06-97/08	-0.031	0.970 **	-0.007	0.019	0.9847	2.318	0.000712	65
1997/07-97/09	0.021	0.976 **	-0.009	0.014	0.9900	1.741	0.000610	66
1997/08-97/10	0.069	0.974 **	0.000	0.015	0.9948	1.547	0.000482	66
1997/09-97/11	-0.018	1.000 **	0.003	-0.005	0.9996	2.723	0.000124	65
1997/10-97/12	-0.012	1.000 **	0.003	-0.006 #	0.9996	2.714	0.000121	66
1997/11-98/01	-0.029	0.971 **	0.031 #	-0.029	0.9768	2.365	0.000948	65
1997/12-98/02	-0.040	1.002 **	0.022	-0.045	0.9591	2.482	0.001339	65
1998/01-98/03	-0.060	1.007 **	0.024	-0.049	0.9623	2.472	0.001348	64
1998/02-98/04	-0.069	1.032 **	-0.002	-0.031	0.9777	2.448	0.000930	64
1998/03-98/05	0.001	1.000 **	0.000	0.001	1.0000	2.453	0.000036	65
1998/04-98/06	0.001	1.000 **	0.000	0.002	0.9999	2.680	0.000044	65
1998/05-98/07	0.003	1.000 **	0.000	0.002	0.9999	2.861	0.000044	66
1998/06-98/08	0.001	1.000 **	0.000	0.001	1.0000	2.893	0.000040	66
1998/07-98/09	-0.003	1.000 **	0.000	0.001	1.0000	2.628	0.000031	66
1998/08-98/10	-0.004	1.000 **	0.000	0.001	1.0000	2.793	0.000032	65
1998/09-98/11	-0.004	1.000 **	0.000	0.000	1.0000	2.634	0.000032	65
1998/10-98/12	0.001	1.000 **	0.000	-0.002 #	1.0000	2.689	0.000032	66
1998/11-99/01	-0.001	1.001 **	-0.001 #	0.000	1.0000	2.728	0.000037	65
1998/12-99/02	0.002	1.001 **	-0.001 *	0.000	1.0000	2.459	0.000036	64
1999/01-99/03	0.002	1.001 **	-0.001 *	0.001	1.0000	2.429	0.000036	64
1999/02-99/04	0.002	1.000 **	-0.001	0.001	0.9999	2.315	0.000040	65
1999/03-99/05	-0.003	1.000 **	-0.001	0.000	0.9999	2.416	0.000051	66
1999/04-99/06	-0.004	1.000 **	-0.001	-0.001	0.9999	2.443	0.000055	65
1999/05-99/07	-0.002	1.000 **	0.001	-0.003	0.9989	2.891	0.000196	65
1999/06-99/08	-0.002	1.003 **	0.000	-0.002	1.0000	2.347	0.000033	66
1999/07-99/09	-0.001	0.999 **	0.000	0.001	1.0000	2.489	0.000025	66
1999/08-99/10	0.002	1.002 **	0.001	-0.001	1.0000	2.536	0.000026	65
1999/09-99/11	0.004	1.003 **	0.001	-0.002	1.0000	2.297	0.000023	65
1999/10-99/12	0.004	0.998 **	0.001	0.001	1.0000	2.377	0.000024	66
1999/11-00/01	0.001	0.992 **	0.000	0.005 #	1.0000	1.977	0.000023	66
1999/12-00/02	0.001	0.999 **	-0.001	0.001	1.0000	1.880	0.000036	65
2000/01-00/03	-0.002	1.008 **	0.000	-0.004	1.0000	1.790	0.000040	65
2000/02-00/04	0.002	1.007 **	0.000	-0.004	1.0000	2.037	0.000042	64
2000/03-00/05	-0.003	1.003 **	0.000	-0.002	1.0000	2.114	0.000040	66
2000/04-00/06	-0.001	1.001 **	0.000	-0.001	1.0000	2.054	0.000038	65
2000/05-00/07	-0.002	1.003 **	0.000	-0.001	1.0000	2.049	0.000035	66
2000/06-00/08	0.002	1.003 **	0.000	-0.001	1.0000	2.282	0.000040	66
2000/07-00/09	0.003	0.997 **	0.001	0.001	1.0000	2.125	0.000050	65
2000/08-00/10	-0.002	0.996 **	0.000	0.002	0.9999	2.002	0.000051	66
2000/09-00/11	-0.002	0.994 **	0.002	0.002	0.9999	2.072	0.000050	65
2000/10-00/12	-0.004	0.998 **	0.001	0.000	0.9999	2.337	0.000049	65
2000/11-01/01	0.002	1.002 **	0.001	-0.002	0.9999	2.426	0.000056	66
2000/12-01/02	0.001	0.999 **	0.001	0.000	0.9999	2.274	0.000060	64
2001/01-01/03	0.002	1.000 **	0.000	0.000	0.9999	2.191	0.000058	65
2001/02-01/04	-0.001	0.998 **	0.000	0.001	1.0000	2.131	0.000049	63
2001/03-01/05	-0.002	1.000 **	0.000	0.000	0.9999	2.179	0.000048	66
2001/04-01/06	-0.002	0.985 **	0.001	0.007 #	0.9999	2.598	0.000050	65
2001/05-01/07	0.000	0.991 **	0.000	0.004	0.9999	2.742	0.000049	66
2001/06-01/08	0.001	0.992 **	-0.001	0.004	1.0000	2.672	0.000038	66
2001/07-01/09	0.000	1.001 **	0.000	0.000	1.0000	2.539	0.000025	65
2001/08-01/10	0.000	1.000 **	0.000	0.000	1.0000	2.351	0.000022	66
2001/09-01/11	0.000	1.000 **	0.000	0.000	1.0000	1.915	0.000017	65
2001/10-01/12	0.000	0.999 **	0.000	0.001	1.0000	1.708	0.000016	66
2001/11-02/01	0.000	1.001 **	0.000	0.000	1.0000	2.073	0.000015	66
2001/12-02/02	-0.001	1.001 **	-0.001	0.000	1.0000	2.442	0.000015	64
2002/01-02/03	0.002	1.002 **	-0.001 **	0.000	1.0000	2.246	0.000017	64
2002/02-02/04	0.000	0.999 **	-0.001	0.001	1.0000	2.170	0.000020	63
2002/03-02/05	-0.001	1.002 **	-0.001 #	-0.001	1.0000	2.062	0.000020	66
2002/04-02/06	0.000	1.000 **	0.000	0.000	1.0000	2.112	0.000018	60

Note: Double asterisks (**), a single asterisk (*) and a pound (#) indicate that the estimated coefficients are statistically significant at the 1%, 5%, and 10% levels, respectively.