

Stabilization of effective exchange rates
under a common currency basket system*

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1. Introduction

A variety of exchange rate systems are found in East Asian countries. The monetary authorities of Japan and Korea are adopting a flexible exchange rate system. On one hand, those of China and Malaysia have been keeping *de facto* a fixed exchange rate system, especially the dollar peg system as shown in Ogawa and Sakane (2005) even though they announced the change in their own exchange rate systems into a managed floating exchange rate system with references with a currency basket on July 21, 2005. East Asian currencies make asymmetric responses to the US dollar depreciation under the variety of exchange rate systems. Moreover, some of the East Asian countries are facing coordination failure in choosing their own exchange rate systems (Ogawa and Ito (2002)) as shown in also the fact that the monetary authority of Malaysia followed the announcement of exchange rate system reform by that of China. It is supposed that all of the monetary authorities should adopt the same type of exchange rate policy, for example, a common currency basket system in order to solve both the asymmetric responses to the US dollar depreciation and the coordination failure among East Asian countries.

If the common currency basket systems are adopted in East Asian countries who have a different structure of trade with the rest of world, effective exchange rates might be more unstable due to different weights on each of foreign currencies between the common currency basket and the effective exchange rate for each of the East Asian currencies. For the reason, it is important to investigate stabilization of effective exchange rate under a common currency basket system because effective exchange rates should have effects on exports and imports, and in turn trade

balances. In this paper, we use an AMU (Asian Monetary Unit), which is a weighted average of ASEAN10¹ plus 3 (Japan, China, and Korea) currencies (Ogawa and Shimizu (2005a, b)), as a common currency basket to investigate whether pegging the currencies to the AMU would contribute to stability of effective exchange rates for each of the East Asian currencies.

The remainder of this paper consists of the following sections. Section 2 classifies several issues of currency basket and overviews the previous researches concerning about the currency basket system in East Asian countries. Section 3 explains the theoretical model of exchange rate system choice within the regional economies and supports the introduction of common currency basket system in East Asian countries. In section 4, we briefly describe our method to calculate the AMU as a common currency basket for East Asian countries. Section 5 investigates its stabilization effects on the effective exchange rates and compares our results with the results of Williamson (2005) which shows the effectiveness of the G3 currency (the US dollar, the Japanese yen, and the euro) basket in the East Asian countries. The final section offers concluding remarks.

2. Currency basket system in East Asia

2-1. Previous researches of currency basket system

Some researchers have advocated desirability of a currency basket system for East Asian countries since the Asian currency crisis. We can find that there are

¹ ASEAN10 includes Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam.

several types of currency basket in their discussion. In this section, we refer the previous researches concerning about the currency basket system in East Asian countries.

At first, we classify two different types of currency basket which have been discussed after the Asian currency crisis. One is a basket of regional currencies that include thirteen currencies of ASEAN10 plus 3. Weights of the regional currencies would reflect the relative economic importance of the countries in the region just like the ECU (European Currency Unit) under the EMS (European Monetary System) during a period from 1979 to 1998. Such a currency basket could be called the AMU, which were calculated in Ogawa and Shimizu (2005a, b).² Secondly, Williamson (1999), Kawai and Takagi (2000), Ogawa and Ito (2002) and others have suggested a G-3 currency basket composed of three major currencies – the US dollar, the Japanese yen, and the euro. In Kawai and Takagi (2000), they recommend that a G-3 currency basket system preserves both flexibility and stability, promoting trade, FDI and economic development.

The advantage of a common G-3 currency basket system is to reduce fluctuations of intra-regional exchange rates as well as fluctuations of exchange rates against the outsiders' currencies. However, there is a view that a currency basket system based on the G-3 currencies is asymmetric between Japan and the other East Asian countries because it gives the Japanese yen special advantages by treating it asymmetrically vis-à-vis other East Asian currencies. Wang (2002) suggests that a more symmetric approach, such as the joint formation of a common currency union like the

² In Ogawa and Shimizu (2005a, b), the AMU deviation indicators, which measure the degree of each currency's exchange rate deviation from the regional average, were also calculated.

EMS or the euro area, is more appropriate to promote the regional cooperation in East Asia. From the standpoint of the regional financial cooperation, we pursue the availability of a currency basket that consists of regional currencies including the Japanese yen.

There is another issue of a currency basket, concerning about weights on component currencies in the currency basket. It is which we should choose a common currency basket or an individual currency basket for desirable currency basket system. The former is based on its own trade pattern and the latter is based on common currency basket weights within the region. Williamson (2005) compared the stabilizing effect on effective exchange rate under both cases and found that a common basket was more useful in stabilizing effective exchange rates. Rajan (2002) indicated that a common basket might be favorable because the possibility of a competitive devaluation would exist if each individual economy pursued its own individual currency basket.

On one hand, Mori et al.(2002) recommended a two-step approach. The first step is to adopt an individual currency basket system by each country and the second step is to move on to a common currency basket. A similar approach, so called “Cluster Approach: different cluster adopting a common currency then expanding and unifying those clusters so as to have one regional currency “ were recommended by Ngiam and Yuen (2001).

2-2. The current situation in East Asian countries

Before discussing the effectiveness of introducing a currency basket system

in East Asia, we would like to observe the current situation of the movement of nominal exchange rates vis-à-vis the US dollar and the Japanese yen and investigate *de facto* weights on the US dollar, the euro, and the Japanese yen for each of the East Asian currencies as well as trade partners' currencies outside of the East Asia.

At first, we overview movements of nominal exchange rates of East Asian currencies. Figure 1 shows the daily movements of nominal exchange rates of the East Asian currencies vis-à-vis the US dollar during a period from January 2000 to October 2005. We set the nominal exchange rate indexes equal to 100 in January 3, 2000. It shows that exchange rates of the US dollar pegging currencies such as the Chinese yuan and Malaysian ringgit vis-à-vis the US dollar were stable around 100 while the Indonesian rupiah and the Philippine peso vis-à-vis the US dollar were vulnerable throughout the period. On the other hand, figure 2 shows the daily movement of nominal exchange rates of East Asian currencies vis-à-vis the Japanese yen in the same period. It shows that exchange rates of all the East Asian currencies vis-à-vis the Japanese yen were unstable throughout the period.

Table 1 shows standard deviations of the daily nominal exchange rates of East Asian currencies vis-à-vis the US dollar and the Japanese yen during the period from January 2000 to October 2005. Even though the standard deviations of exchange rates of the US dollar pegging currencies vis-à-vis the US dollar were smaller than a unity and those of the Singapore dollar and the Brunei dollar vis-à-vis the US dollar were also around 3.3, those of all East Asian currencies vis-à-vis the Japanese yen were larger than 4. Especially, the standard deviations of the US dollar pegging currencies, such as the Chinese yuan and the Malaysian

ringgit, vis-à-vis the Japanese yen were larger than 5. It means that the dollar peg system is not so appropriate from the viewpoint of the stability of their exchange rates vis-à-vis the Japanese yen.

Next, tables 2, 3, and 4 show the bilateral trade weights of imports, exports, and a sum of imports and exports for each East Asian country in 2000 and 2004. The tables show that the average of intra-regional trade weights (in term of a sum of import plus export) of the East Asian countries were 51.0 percent. Especially, the average of intra-regional import weights has steadily increased to 57.9 percent in 2004. Japan was the region's largest trade partner for most of the East Asian countries. However, the trade weights with China have increased recently and some East Asian countries, such as South Korea and Singapore, had stronger trade relationship with China than Japan in 2004. Furthermore, the average of trade weights of the East Asian countries with the United States was decreased to 12.5 percent, which is even lower than with EU in 2004.

Tables 5 and 6 indicate the latest actual weights on the three major currencies for each of the East Asian currencies in 2004 and 2005 (until November 11, 2005). We estimated the weights on the US dollar, the euro, and the Japanese yen in a possible currency basket for each of the East Asian countries according to a method of Frankel and Wei (1994).³ Our analytical results show that some of the countries still have strong linkages of their home currencies with the dollar while some of the countries have increased their weights on the Japanese yen recently. As just described, we can divide twelve East Asian currencies into the following two

³ By using the daily exchange rates, log differences of each East Asian currency (in terms of the Swiss franc) were regressed on log differences of three major currencies (in terms of the Swiss franc). These method were widely conducted by Kawai and Akiyama (2000), Ogawa (2002b), and others.

groups.

One is the group of the US dollar pegging currencies. Coefficients on the US dollar were almost a unity in the cases of the Chinese yuan and the Malaysian ringgit. Those were close a unity in 2004 in the cases of other minor currencies, such as the Cambodia riel, the Las kip, the Myanmar kyat, and the Vietnamese dong. Their weights on the US dollar are still close to a unity but have slightly decreased in 2005 due to the announcement of Chinese government's changing its exchange rate system into a managed floating system with references with a currency basket on July 21, 2005. These results indicate that they have actually kept their *de facto* dollar peg system in 2005.

The other is the group of the currencies that have linkages with a currency basket of the US dollar, the euro, and the Japanese yen. We obtained the following results of estimation of weights in a possible currency basket. In the case of Singapore, the weights on the US dollar, the euro, and the Japanese yen were 0.5787, 0.1603, and 0.2729, respectively in 2004, and then they have changed to 0.5021, 0.1707, and 0.3926 in 2005.⁴ In the case of Thailand, the weights on the US dollar, the euro, and the Japanese yen were 0.7272, 0.1920, and 0.1923, respectively in 2004, and then they have changed to 0.6172, 0.1301 (insignificant), and 0.3124 in 2005. We can find the similar movements in the cases of South Korea, Indonesia, and the Philippines. Even in the case of the Chinese yuan, the weights on the Japanese yen has become significant and 0.0935 in 2005.

Accordingly, we obtained the results that the actual exchange rate systems applied by East Asian countries have basically headed from the dollar peg system or

⁴ Since Brunei adopts the Singapore dollar peg system, we can find the almost same movements in the case of Brunei dollar.

the *de facto* dollar peg system to more flexible exchange rate system. However, the monetary authorities have still the overwhelming weight on the US dollar in the cases of a half of the East Asian currencies. It is important to consider what factors forced the East Asian currencies to keep the strong linkages with the US dollar. We can point out some factors, which include the dollar as a nominal anchor, appreciation of the Japanese yen against the US dollar, and coordination failure in choosing exchange rate system under intra-regional trade competition. We will focus on the coordination failure among the factors in the next section.

3. Common currency as a solution for coordination failure in choosing exchange rate systems

Ogawa and Ito (2002) pointed out that the monetary authorities of East Asian countries might have been forced to keep a *de facto* dollar peg system instead of adopting a desirable exchange rate system such as a currency basket system, even if they find that they would be better-off by adopting it rather than a dollar peg system,⁵ according to lessons they learned from the Asian currency crisis in 1997. The situation can be described as a kind of coordination failure. Suppose that all East Asian countries have been adopting the *de facto* dollar peg system at the present time and that each of them knows that it should adopt an optimal currency basket system, for example, to stabilize fluctuations of its trade balances with an internationally diversified trading structure.

Suppose that one country switches from the dollar peg system to a currency basket system while the others keep the dollar peg system. The country with a

⁵ Bénassy-Quéré (1999) and Ohno (1999) analyzed pegging the US dollar as a coordination failure.

currency basket system, say, country A, might be faced with an increase in fluctuations in trade balances. If the US dollar depreciates against the Japanese yen, the real effective appreciation of country A's currency against the other currencies that are pegged to the US dollar worsens the price competitiveness of exporting firms of country A. On the other hand, if the US dollar appreciates against the Japanese yen, the real effective depreciation of country A's currency against the other currencies improves the price competitiveness of exporting firms of country A. Thus, the country that adopted a currency basket system alone is faced with an increase in the degree of fluctuations of trade balances. Therefore, the monetary authorities of country A are induced to keep the dollar peg system. Similarly, each of the monetary authorities rationally keeps the dollar peg system if they cannot make a coordinated decision but a sequential unilateral decision.

Thus, each of the monetary authorities will keep pegging their home currencies to the dollar if their trade balances fluctuate more widely in the case of unilaterally pegging its currency to an optimal currency basket peg. When this is the case, they are faced with coordination failure in that they are forced to adopt the dollar peg even though the optimal currency basket peg, if jointly adopted, will minimize the fluctuations in trade balances. Only when both monetary authorities coordinated with each other to adopt the optimal currency basket peg simultaneously can they peg their home currencies to the optimal currency basket.

Suppose that risk-averse monetary authorities choose their exchange rate system under uncertainty; then the monetary authorities are more likely to be faced with coordination failure. Risk-averse monetary authorities, who have a usual utility function with diminishing marginal utility, place a heavier weight on

increase in their utility of loss caused by exchange rate fluctuations than on decrease in their utility of loss even though they expect that the expected losses are the same. Suppose that the risk-averse monetary authorities of one country shift from the *de facto* dollar peg system to an optimal currency basket system while the monetary authorities of other countries keep the *de facto* dollar peg system. The currency would appreciate against the neighbors' currencies if the US dollar depreciated against the Japanese yen, while it would depreciate against the neighbors' currencies if the US dollar appreciated against the Japanese yen. Because risk-averse monetary authorities place a heavier weight on increases in loss caused by shifting their exchange rate system, they tend to hesitate to shift to the optimal currency basket system. Therefore, under such uncertainty, risk-averse monetary authorities tend to take the strategy of wait and see *vis-à-vis* behavior of the other.

If all of the monetary authorities are risk averse, they cannot help but choose to keep the dollar peg system, which is Nash equilibrium, although they should know that there is a cooperative solution that is superior to a Nash equilibrium. Coordination among some of the monetary authorities of the East Asian countries is necessary for shifting from a situation of the Nash equilibrium to a cooperative solution. The monetary authorities should implement regional coordination for exchange rate arrangements or exchange rate policies.

One way to implement regional coordination is by making all the monetary authorities in the region agree on an arrangement to create a common currency unit that consists of a currency basket. They might make a commitment to follow the common currency value in conducting their exchange rate policy. It is necessary to

create a common currency basket as a common currency unit that monetary authorities of East Asian countries should refer to when they conduct their exchange rate policies with regional coordination.

Such regional currency arrangements would help to prevent competitive devaluation among the related currencies in a region as well as to solve coordination failure. If the monetary authorities of a country devalue its home currency, the devaluation worsens the price competitiveness of products made in neighboring countries. For that reason, the monetary authorities of the other countries would find it attractive to devalue their home currency, following the first country's devaluation. The regional currency arrangements under which the monetary authorities in the region make a commitment to a coordinated exchange rate policy would prevent a possible competitive devaluation as well as the inertia problem that causes coordination failure.

In addition, regional currency arrangements to keep the exchange rate linked to a common currency basket will help prevent competitive devaluation among the currencies in a region because the monetary authorities have a commitment to the arrangements.

Under a common currency basket system, the monetary authorities in the region should peg or target their home currencies to a common basket currency. In a rigid system where the monetary authorities peg their home currencies to a common basket currency, the currencies in the region are pegged with each other. In a more flexible system where they target their home currencies within a band around a central parity rate vis-à-vis the common basket currency, the currencies are linked to each other within a band. Thus, if they adopted a common basket

currency system, their currencies would be linked with each other at a parity rate or within a band around a central parity rate.

It is more tractable for the monetary authorities to link their home currencies to a common currency unit that is equivalent to the common basket currency. A common currency unit should be composed of major trader partners on which major weight is placed in calculating an effective exchange rate. They should include the US dollar and the euro as well as the intra-regional currencies which include the Japanese yen from the viewpoint of international trade. ⁶

Countries of the EU (European Union) adopted the EMS where their home currencies were linked to a common currency unit, the ECU, during the period 1979–1998. The ECU was composed of only the currencies of the EMS member countries. Their currencies were linked to the ECU with a band while the ECU was floating against the other currencies that included the US dollar and the Japanese yen. The monetary authorities had the obligation to intervene in the foreign exchange markets to keep the exchange rates of the currency in the region against the other EMS currencies within a band.

One method to adopt a common basket currency system is for the monetary authorities to create a common currency unit, which consists of currencies of the member countries like the ECU, and link their currencies to the common currency unit. Moreover, also a value of the common currency unit against the US dollar and the euro might be stable if they make coordination to try to stabilize their own home currencies to the two currencies.

⁶ Kim et al. (2000) suggested that the Asian currency unit was composed of only the East Asian currencies including the Japanese yen.

4. Calculating the value of the AMU

In this section, we offer the AMU as a common currency basket and briefly describe our method to calculate the AMU.⁷

We calculate the AMU as a weighted average of East Asian currencies following the method used to calculate the ECU adopted under the EMS prior to the introduction of the euro. We use the ASEAN10 plus 3 currencies to calculate the AMU. The weight of each currency in the basket is based on countries' respective share in regional GDP measured at PPP (Purchasing Power Parity) and their trade volume share (the sum of exports and imports) in 2001-2003 in order to reflect the most recent trade relationships and economic conditions of the thirteen East Asian countries for calculation of the AMU. We quote the value of the AMU in terms of a trade weighted average of the US dollar and the euro (US\$-euro) because both the United States and the EU countries are important trading partners for East Asia. We use a weight of 65% for the US dollar and of 35% for the euro.⁸

Then we choose a benchmark period in order to calculate AMU Deviation Indicators based on the following criterion: the total trade balance of member countries, the total trade balance of member countries (excluding Japan) with Japan, and the total trade balance of member countries with the rest of world should be close to zero. Table 7, which shows the trade accounts of the thirteen East

⁷ The CMI calls on the region's monetary authorities to monitor exchange rate movements and therefore we propose a possible way in which an AMU could be constructed and develop AMU Deviation Indicators. These should help to coordinate exchange rate policies in East Asia, thereby enhancing the monetary authorities' surveillance capabilities. Please see the details about AMU deviation Indicators in Ogawa and Shimizu (2005a, b).

⁸ We calculate the average trade volumes for 2001-2003.

Asian countries from 1990 to 2003, indicates that the trade accounts were closest to balance in 2001. Assuming a one-year time lag before changes in exchange rates affect trade volumes, we should choose two years of 2000 and 2001 as the benchmark period. For the benchmark period, the exchange rate of the AMU in terms of the US\$-euro is set at unity. We define the exchange rate of each East Asian currency in terms of the AMU during the benchmark period as the Benchmark Exchange Rate.

In summary, the AMU weights are calculated based on both the arithmetic shares of trade volumes and GDP measured at PPP for 2001-2003. The Benchmark Exchange Rate for each currency is defined in terms of the AMU during a period from 2000 to 2001. Table 8 shows the AMU weights as well as trade volumes, GDP measured at PPP, arithmetic shares, and the Benchmark Exchange Rates.

We define the nominal exchange rate of the AMU in terms of the US\$-euro as the weighted sum of each country's US\$-euro exchange rate using the AMU weights in Table 8. Figure 3 shows the daily movements in the nominal exchange rate of the AMU in terms of the US\$-euro. For reference, we add the daily movements of the nominal exchange rates of the AMU in terms of each of the US dollar and the euro. Figure 4 shows daily movements in exchange rates of the East Asian currencies vis-à-vis the AMU. In the next section, we will use these exchange rates to simulate the nominal effective exchange rates of East Asian countries.

5. The stabilization effects on the effective exchange rates under the AMU

In this section, we investigate the stabilization effects of the AMU peg

system on the effective exchange rates and compare our result with the result of Williamson (2005) which shows effectiveness of the common G3 currency basket in the East Asian countries.

As McKinnon (2002) emphasized, the major objective of adopting a common currency peg within the region is the insulation effect of the trading relationship of the region from the disturbances of outside currencies. In other words, a common currency peg would guarantee that any change in third-country exchange rates, such as the US dollar or the euro would never disturb the trading relationships among the East Asian countries themselves. Against such advantages, Williamson (2005) examined whether use of a common currency basket would provide adequate stability of the participating countries' effective exchange rates. Furthermore, he examined two different types of currency basket peg. One is the currency basket which consists of all major trading partners and other is the currency basket which is restricted to outside trading partners. In practice, the former type includes other East Asian currencies and based on its own trade pattern. On one hand, the later type uses a common currency basket of outsiders' currencies, such as the US dollar, the euro, and the Japanese yen. We call the latter type of currency basket as a common G-3 currency basket in order to distinguish it from the AMU, which we newly add to his analysis. Alternatives of currency basket weights are shown in Table 9.

According to the empirical analysis in Williamson (2005), we simulate how the effective exchange rates would have moved under the alternative exchange rate systems by using the daily exchange rate changes during a past period. Williamson applied two exchange rate systems, that include an individual currency basket peg

system and a common G-3 currency basket peg system. To add his results, we simulate the effective exchange rates under the AMU peg system by using exchange rates of the East Asian currencies vis-à-vis the AMU.

Furthermore, we suppose three different cases under the AMU peg system. The first is the case where only one country applies the AMU peg system. The second is the case where ASEAN countries apply the AMU peg system. The third is the case where all of the AMU participating countries apply the AMU peg system. When we simulate each of East Asian effective exchange rate, we choose seven East Asian currencies and use the same basket weights as Williamson in the column of “Own basket” of Table 9 in order to compare the results with each other. Table 10 shows the standard deviation of nominal effective exchange rates of seven East Asian currencies under actual historical data, a peg to an individual country basket as shown in first column in table 9, a peg to a common G-3 currency basket system as shown in the second column in table 9, and a peg to a AMU basket as shown in the third column in table 9 during the five years period from 2000 to 2004.⁹

The AMU peg system would have stabilized the effective exchange rates in all of the sampled countries. The results indicate that the AMU peg system could reduce the volatilities of their effective exchange rates by reducing instability of intra-regional exchange rates. Furthermore, the AMU peg system would be more effective to reduce the instability of effective exchange rates as the number of country who applies the AMU peg system increases. On the other hand, comparing the common G-3 currency basket peg system, the AMU peg system would have led

⁹ As Williamson noted, we assume that countries have a rigid peg to their basket so that the exchange rates of participating currencies were always equal to their central rates in order to make these simulation.

to more stability than a common G-3 currency basket peg system in four (Indonesia, the Philippines, Singapore and Thailand) of the seven cases. We suppose that the AMU peg system would be useful for the countries whose intra-regional trade weights are relatively higher than the trade weights with outsiders.

6. Conclusion

We investigated the stabilizing effects of a common currency basket system on effective exchange rates. In this paper, we regard the AMU as a common currency basket to investigate whether the AMU peg system would provide the stability of the participating countries' effective exchange rates.

Reviewing the current situation, we found that the actual exchange rate systems applied by East Asian countries have basically headed from the US dollar peg to more flexible exchange rate system. The movements make a variety of exchange rate systems among East Asian countries. However, the East Asian currencies have still an overwhelming weight on the US dollar in the Frankel and Wei's methodology of estimation. If they really worried about the instability of their effective exchange rates, a common currency basket peg would contribute to stability of the intra-regional exchange rates. As many previous researches discussed, there are several types of currency basket., such as the currency basket composed by outsiders' currencies (the US dollar and the euro) and the currency basket (AMU) composed by intra-regional currencies.

In this paper, we simulated the effective exchange rates of East Asian currencies under the AMU peg system. We obtained the following results. Firstly,

the AMU peg system would be more effective to reduce fluctuations of effective exchange rates as the number of country who applies the AMU peg system increases. Secondly, comparing the common G-3 currency basket peg system which was simulated by Williamson (2005), the AMU peg system would have led to more stability than a common G-3 currency basket peg system in four of the seven cases (Indonesia, the Philippines, Singapore and Thailand). The difference between the common G-3 currency basket peg system and the AMU peg system is that the former could reduce fluctuations of intra-regional exchange rates as well as reduce those of exchange rates of the currencies against the US dollar and the euro while the latter could reduce only fluctuations of intra-regional exchange rates.

In order to simulate the effective exchange rates, we assume that countries have a rigid peg to their basket so that the exchange rates of participating currencies were always equal to their central rate. More practically, we should assume the system which adopts a common currency peg with a band. We would like to resolve this point in our further research.

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Table 1.

The Standard Deviation of the Nominal Exchange rates vis-à-vis the US dollar and the Japanese yen (Jan 2000–Oct 2005)

vis-à-vis	Brunei\$	Cambodia riel	Chinese yuan	Indonesian rupiah	Japanese yen	South Korean won	Laos kip	Malaysian ringgit	Myanmar kyat	Philippine peso	Singapore \$	Thai baht	Vietnamese dong
the US dollar	3.3095	2.4634	0.4968	12.0070	7.7533	8.0124	12.6017	0.2148	2.9470	10.7461	3.3055	5.7297	4.2340
the Japanese yen	4.0213	7.0774	5.9416	9.7431	–	4.3853	14.7617	5.9454	5.2879	12.5013	4.0218	4.0582	7.6960

Calculated by authors. All exchange rate data are from Datastream.

Table 2.

Trade weight of East Asian countries (Export)

2000	ASEAN10+3	Japan	China	United States	EU	rest of the world
Brunei Darussalam	78.5%	40.7%	1.8%	12.0%	3.6%	5.9%
Cambodia	9.9%	1.0%	2.1%	65.9%	20.6%	3.6%
China,P.R.: Mainland	28.2%	16.7%	–	20.9%	16.4%	34.5%
Indonesia	52.1%	23.2%	4.5%	13.7%	14.3%	19.9%
Japan	27.1%	–	6.3%	30.1%	16.8%	25.9%
South Korea	34.4%	11.9%	10.7%	22.0%	14.4%	29.2%
Lao People's Dem.Rep.	47.1%	2.8%	1.5%	2.3%	26.2%	24.4%
Malaysia	46.0%	13.0%	3.1%	20.5%	14.0%	19.5%
Myanmar	33.6%	5.5%	5.7%	22.4%	16.7%	27.4%
Philippines	35.1%	14.7%	1.7%	29.9%	18.1%	16.9%
Singapore	42.4%	7.5%	3.9%	17.3%	14.0%	26.3%
Thailand	40.0%	14.7%	4.1%	21.3%	16.3%	22.4%
Vietnam	48.9%	17.8%	10.6%	5.1%	20.5%	25.5%
Average	40.3%	14.1%	4.7%	21.8%	16.3%	21.7%

2004	ASEAN10+3	Japan	China	United States	EU	rest of the world
Brunei Darussalam	73.9%	38.1%	4.5%	8.6%	2.6%	14.9%
Cambodia	12.3%	3.5%	1.0%	55.9%	25.9%	6.0%
China,P.R.: Mainland	24.3%	12.4%	–	21.1%	18.1%	36.5%
Indonesia	53.7%	22.3%	6.4%	12.3%	12.6%	21.4%
Japan	33.8%	–	13.1%	22.7%	15.8%	27.7%
South Korea	37.7%	8.6%	19.7%	17.0%	15.0%	30.3%
Lao People's Dem.Rep.	36.6%	1.3%	2.1%	0.6%	28.6%	34.3%
Malaysia	45.4%	10.1%	6.7%	18.8%	12.6%	23.3%
Myanmar	56.5%	5.3%	6.0%	0.0%	16.1%	27.4%
Philippines	46.9%	20.1%	6.7%	18.2%	17.2%	17.8%
Singapore	43.5%	6.4%	8.6%	13.0%	14.5%	29.1%
Thailand	44.8%	13.9%	7.3%	15.9%	14.7%	24.6%
Vietnam	38.1%	13.6%	9.0%	20.2%	23.6%	18.2%
Average	42.1%	13.0%	7.6%	17.3%	16.7%	23.9%

Source: DOTS of IMF (Nov. 2005)

ASEAN10+ 3 includes ASEAN10 countries plus South Korea, China and Japan.

Table 3.

Trade weight of East Asian countries (Import)

2000	ASEAN10+3	Japan	China	United States	EU	rest of the world
Brunei Darussalam	64.7%	4.7%	1.2%	10.8%	15.8%	8.8%
Cambodia	56.3%	4.1%	7.9%	2.3%	6.6%	34.8%
China,P.R.: Mainland	38.6%	18.4%	–	9.9%	13.6%	37.8%
Indonesia	47.7%	16.1%	6.0%	10.1%	12.5%	29.6%
Japan	35.6%	–	14.5%	19.1%	12.6%	32.7%
South Korea	39.1%	19.8%	8.0%	18.2%	10.1%	32.5%
Lao People's Dem.Rep	87.3%	3.4%	5.5%	0.7%	6.5%	5.5%
Malaysia	53.5%	21.1%	3.9%	16.6%	11.0%	18.8%
Myanmar	80.8%	7.1%	18.0%	0.6%	4.0%	14.6%
Philippines	44.7%	18.9%	2.3%	18.6%	9.2%	27.6%
Singapore	50.8%	17.2%	5.3%	15.1%	11.9%	22.2%
Thailand	50.3%	24.7%	5.5%	11.8%	10.4%	27.5%
Vietnam	63.3%	14.7%	9.0%	2.3%	8.7%	25.6%
Average	54.8%	14.2%	7.3%	10.5%	10.2%	24.5%

2004	ASEAN10+3	Japan	China	United States	EU	rest of the world
Brunei Darussalam	72.6%	7.2%	3.1%	3.3%	15.5%	8.6%
Cambodia	69.2%	2.5%	13.6%	1.8%	4.2%	24.7%
China,P.R.: Mainland	39.1%	16.8%	–	8.0%	12.5%	40.4%
Indonesia	50.8%	13.1%	8.8%	7.0%	11.4%	30.8%
Japan	40.4%	–	20.7%	14.0%	12.7%	32.9%
South Korea	43.7%	20.6%	13.2%	12.9%	10.8%	32.6%
Lao People's Dem.Rep	84.9%	1.5%	10.3%	0.6%	8.0%	6.5%
Malaysia	55.2%	16.1%	9.9%	14.6%	12.1%	18.1%
Myanmar	85.8%	3.4%	29.8%	0.4%	3.1%	10.7%
Philippines	48.7%	17.4%	6.0%	18.8%	8.3%	24.2%
Singapore	48.9%	11.7%	9.9%	12.7%	13.5%	24.8%
Thailand	52.6%	23.6%	8.6%	7.6%	9.9%	29.9%
Vietnam	60.4%	10.5%	13.7%	3.8%	9.2%	26.6%
Average	57.9%	12.0%	12.3%	8.1%	10.1%	23.9%

Source: DOTS of IMF (Nov. 2005)

ASEAN10+ 3 includes ASEAN10 countries plus South Korea, China and Japan.

Table 4.

Trade weight of East Asian countries (Export+Import)

2000	ASEAN10+3	Japan	China	United States	EU	rest of the world
Brunei Darussalam	74.2%	29.5%	1.6%	11.6%	7.4%	6.8%
Cambodia	35.9%	2.7%	5.4%	30.3%	12.8%	21.0%
China,P.R.: Mainland	33.1%	17.5%	–	15.7%	15.1%	36.1%
Indonesia	50.6%	20.7%	5.0%	12.4%	13.7%	23.3%
Japan	30.9%	–	10.0%	25.2%	14.9%	28.9%
South Korea	36.7%	15.7%	9.4%	20.2%	12.3%	30.8%
Lao People's Dem.Rep	72.8%	3.2%	4.0%	1.3%	13.6%	12.3%
Malaysia	49.4%	16.7%	3.5%	18.8%	12.6%	19.2%
Myanmar	62.2%	6.5%	13.1%	9.2%	9.0%	19.6%
Philippines	39.7%	16.7%	2.0%	24.5%	13.9%	21.9%
Singapore	46.5%	12.3%	4.6%	16.2%	13.0%	24.3%
Thailand	44.9%	19.5%	4.7%	16.8%	13.5%	24.8%
Vietnam	56.4%	16.2%	9.8%	3.6%	14.4%	25.5%
Average	48.7%	14.8%	6.1%	15.8%	12.8%	22.7%

2004	ASEAN10+3	Japan	China	United States	EU	rest of the world
Brunei Darussalam	73.6%	29.9%	4.1%	7.2%	6.0%	13.2%
Cambodia	45.2%	2.9%	8.3%	24.7%	13.4%	16.8%
China,P.R.: Mainland	31.5%	14.5%	–	14.7%	15.4%	38.4%
Indonesia	52.5%	18.7%	7.4%	10.2%	12.2%	25.1%
Japan	36.7%	–	16.5%	18.8%	14.4%	30.0%
South Korea	40.5%	14.2%	16.6%	15.1%	13.0%	31.4%
Lao People's Dem.Rep	68.5%	1.4%	7.5%	0.6%	15.0%	15.9%
Malaysia	49.8%	12.8%	8.1%	16.9%	12.4%	20.9%
Myanmar	71.9%	4.3%	18.5%	0.2%	9.3%	18.6%
Philippines	47.8%	18.7%	6.3%	18.5%	12.5%	21.2%
Singapore	46.1%	9.0%	9.2%	12.9%	14.0%	27.1%
Thailand	48.6%	18.7%	7.9%	11.8%	12.3%	27.2%
Vietnam	50.7%	11.9%	11.7%	11.0%	15.5%	22.9%
Average	51.0%	13.1%	10.2%	12.5%	12.7%	23.7%

Source: DOTS of IMF (Nov. 2005)

ASEAN10+ 3 includes ASEAN10 countries plus South Korea, China and Japan.

Table 5.

The linkages of East Asian currencies with three major currencies (2004)

	US dollar		euro		Japanese yen		Adj. R2
Chinese yuan	1.0003 (0.0002)	***	-0.0004 (0.0006)		-0.0001 (0.0002)		0.9999
Singapore dollar	0.5787 (0.0229)	***	0.1603 (0.0622)	**	0.2729 (0.0208)	***	0.9095
Thai baht	0.7272 (0.0273)	***	0.1920 (0.0741)	**	0.1923 (0.0248)	***	0.8962
Malaysian ringgit	1.0046 (0.0026)	***	0.0001 (0.0070)		-0.0035 (0.0023)		0.9992
Philippine peso	0.9101 (0.0230)	***	0.0004 (0.0624)		0.0661 (0.0208)	***	0.9323
Indonesian rupiah	0.7445 (0.0631)	***	0.1309 (0.1714)		0.1973 (0.0573)	***	0.6216
South Korean won	0.7557 (0.0454)	***	0.2412 (0.1233)	*	0.1905 (0.0412)	***	0.7706
Burunei dollar	0.6087 (0.0250)	***	0.2692 (0.0679)	***	0.1911 (0.0227)	***	0.8893
Cambodia riel	0.9953 (0.0316)	***	0.0715 (0.0858)		0.0018 (0.0287)		0.8899
Las kip	0.9844 (0.0134)	***	-0.0158 (0.0364)		-0.0009 (0.0122)		0.9771
Myanmar kyat	0.9872 (0.0101)	***	-0.0095 (0.0275)		0.0095 (0.0092)		0.9871
Vietnamese dong	0.9968 (0.0056)	***	-0.0199 (0.0151)		0.0036 (0.0051)		0.9961

Calculated by authors. All exchange data are from Datastream.

1. We estimated weights on the US dollar, the euro and the Japanese yen in a possible currency basket for some East Asian countries according to a method of Frankel and Wei (1994).

2. Standard errors are in parenthesis. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Table 6.

The linkages of East Asian currencies with three major currencies (2005)

	US dollar		euro		Japanese yen		Adj. R2
Chinese yuan	0.9213 (0.01974)	***	0.0412 (0.06141)		0.0935 (0.02100)	***	0.9576
Singapore dollar	0.5021 (0.0271)	***	0.1707 (0.0844)	**	0.3926 (0.0289)	***	0.8817
Thai baht	0.6182 (0.0374)	***	0.1301 (0.1163)		0.3124 (0.0398)	***	0.8163
Malaysian ringgit	0.9869 (0.0252)	***	0.0228 (0.0784)		-0.0124 (0.0268)		0.9337
Philippine peso	0.8428 (0.0374)	***	0.0727 (0.1162)		0.1178 (0.0397)	***	0.8473
Indonesian rupiah	0.6728 (0.1161)	***	0.0910 (0.3614)		0.2305 (0.1236)	*	0.3075
South Korean won	0.5597 (0.0594)	***	0.2179 (0.1847)		0.2169 (0.0632)	***	0.5715
Burunei dollar	0.5264 (0.0295)	***	0.1619 (0.0917)	*	0.2931 (0.0314)	***	0.8480
Cambodia riel	0.9255 (0.0692)	***	0.2195 (0.2154)		-0.0242 (0.0737)		0.6309
Las kip	0.6751 (0.2962)	**	-1.1907 (0.9216)		0.2262 (0.3151)		0.0359
Myanmar kyat	0.9437 (0.0268)	***	0.0973 (0.0833)		-0.0214 (0.0285)		0.9202
Vietnamese dong	0.9944 (0.0062)	***	-0.0158 (0.0193)		0.0057 (0.0066)		0.9958

Calculated by authors. All exchange data are from Datastream.

1. We estimated weights on the US dollar, the euro and the Japanese yen in a possible currency basket for some East Asian countries according to a method of Frankel and Wei (1994).

2. Standard errors are in parenthesis. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Table 7.

Trade Accounts of ASEAN10 + 3(Japan, South Korea & China)

millions of US\$

	with Japan*	within ASEAN+3	with World
1990	-23,437	-1,695	35,851
1991	-33,084	-4,666	58,013
1992	-41,172	-811	91,249
1993	-54,184	-4,940	89,923
1994	-65,089	9,572	105,815
1995	-73,856	14,672	82,362
1996	-59,680	12,278	26,041
1997	-54,531	26,484	103,764
1998	-29,802	12,131	242,064
1999	-32,065	4,819	221,181
2000	-37,239	-6,562	191,768
2001	-23,997	1,953	134,520
2002	-40,027	12,289	168,690
2003	-55,724	27,727	196,539

Notes: All figures are calculated by authors. Trade data are from DOTS (IMF) and GDP data are from IFS (IMF).

* The figure of trade account with Japan is the total amount of trade accounts with 12 East Asian countries.

Table 8.

AMU weights of East Asian Currencies (benchmark year=2000/2001)

	Trade volume* %	GDP measured at PPP**, %	Arithmetic shares % (a)	Benchmark exchange rate*** (b)	AMU weights (a)/(b)
Brunei	0.41	0.41	0.41	0.5912	0.0069
Cambodia	0.19	0.21	0.20	0.0003	7.4235
China	21.65	47.93	34.79	0.1256	2.7711
Indonesia	4.67	5.56	5.12	0.0001	452.7871
Japan	27.31	28.30	27.80	0.0091	30.5681
South Korea	12.86	6.65	9.76	0.0009	113.1459
Laos	0.09	0.08	0.08	0.0001	5.9500
Malaysia	8.85	1.83	5.34	0.2735	0.1953
Myanmar	0.38	0.38	0.38	0.1598	0.0239
Philippines	3.12	2.74	2.93	0.0220	1.3347
Singapore	11.90	0.81	6.36	0.5912	0.1075
Thailand	6.60	3.56	5.08	0.0246	2.0630
Vietnam	1.96	1.53	1.74	0.0001	243.0432

* : The trade volume is calculated as an average of total export and import volumes in 2001, 2002 and 2003 from DOTS (IMF).

** : GDP measured at PPP is the average of GDP measured at PPP in 2001, 2002 and 2003 from the World Development Report, World Bank. For Brunei and Myanmar, we use same share of trade volume since there are no GDP data for Brunei and Myanmar.

*** : Benchmark exchange rate (\$-euro/Currency) is the average of daily exchange rate in terms of \$-euro in 2000 and 2001.

Table 9.

Basket weights for 7 East Asian currencies (percent)

Country	Own basket		Common basket (G3)		Common basket (AMU)	
China	US dollar	25.1	US dollar	40.2		
	euro	20.9	euro	31.6		
	Yen	22.9	Yen	28.2		
	HK dollar	19.3				
	Won	11.8				
Indonesia	US dollar	14.9	US dollar	40.2		
	euro	16.1	euro	31.6		
	Yen	29.7	Yen	28.2		
	RMB	12.8				
	MYR	7.9				
	Sing. dollar	11.6				
	Won	7.0			Brunei	0.4
Malaysia	US dollar	25.8	US dollar	40.2	Cambodia	0.2
	euro	15.0	euro	31.6	China	34.8
	Yen	19.5	Yen	28.2	Indonesia	5.1
	RMB	12.4			Japan	27.8
	HK dollar	6.9			South Korea	9.8
	Sing. dollar	20.3			Laos	0.1
					Malaysia	5.3
Philippines	US dollar	22.5	US dollar	40.2	Myanmar	0.4
	euro	13.8	euro	31.6	Philippines	2.9
	Yen	24.5	Yen	28.2	Singapore	6.4
	RMB	12.6			Thailand	5.1
	HK dollar	9.1			Vietnam	1.7
	MYR	6.6				
	Sing. dollar	10.9				
Singapore	US dollar	22.5	US dollar	40.2		
	euro	19.0	euro	31.6		
	Yen	15.7	Yen	28.2		
	RMB	16.2				
	MYR	26.7				
South Korea	US dollar	26.6	US dollar	40.2		
	euro	17.6	euro	31.6		
	Yen	25.4	Yen	28.2		
	RMB	30.4				
Thailand	US dollar	19.9	US dollar	40.2		
	euro	16.0	euro	31.6		
	Yen	31.5	Yen	28.2		
	RMB	13.4				
	MYR	9.5				
	Sing. dollar	9.8				

Own basket and Common basket (G3) are from Williamson (2005). Common basket (AMU) are calculated by authors.

Source: DOTS, May 2005 (IMF).

Table 10.

Standard deviation of East Asian nominal effective exchange rates under different pegs, 2000–2004

Country	① Actual historical experience	② Individual-country peg	③ Common basket (G3) peg	④ Common basket (AMU) peg		
				own country only	within ASEAN	within ASEAN+3
China	5.21	4.38	2.32	3.50	3.50	3.09
Indonesia	6.35	6.32	3.55	2.16	2.15	1.78
Malaysia	5.29	3.44	1.89	2.23	2.04	1.94
Philippines	9.55	12.91	5.08	2.13	2.07	1.89
Singapore	2.54	1.78	2.54	2.34	2.18	2.10
South Korea	3.32	3.96	1.78	2.11	2.11	1.97
Thailand	2.92	3.55	1.89	2.07	2.05	1.77

The results of ①②③ are from Williamson (2005) and ④ are calculated by authors.

① Standard deviations of period end monthly nominal effective exchange rates are from IFS, May 2005 (IMF). Data for Indonesia are from Thomson Datastream Series JPMIDNB. Data for South Korea and Thailand real effective exchange rates are from the Citibank CTERI database (January 2000=100).

② Nominal effective exchange rates (NEER) with individual-country pegs are calculated as follows: The weights shown in table 4, column 1, were used to calculate what the dollar exchange rate (LCU/\$) would have been. Actual exchange rates against the dollar were used to derive other hypothetical rates. These were combined with the trade weights to estimate a hypothetical time path for the NEER. The standard deviation of that path is reported in the table. All bilateral exchange rates are set at January 2000=100.

③ Common basket pegs composed by G3 currencies are calculated using 1999 as the base year (\$1=0.9363euro and \$1=113.91), with the weights of dollar, euro and yen composition of 40.2, 31.6, and 28.2 respectively. From these, the LCU/\$, euro, and ¥ implied by the basket composition and dollar/euro/yen exchange rates are calculated. These are weighted by the individual-country trade weights to yield the NEERs with the common basket peg. All bilateral exchange rates are set at January 2000=100.

④ Common basket pegs (AMU) composed by ASEAN+3 currencies are calculated using 2000 and 2001 as the base year. From these, the US \$, euro, ¥ and East Asian currencies in terms of AMU are calculated. These are weighted by the individual-country trade weights to yield the NEERs with the AMU peg. There are three different types of AMU peg. First is the case in which own country only applies the AMU peg. Second is the case in which AMU pegs are applied within ASEAN countries. Third is the case in which the AMU pegs are applied within ASEAN +3 countries. All bilateral exchange rates are set at January 2000=100.

Figure 1.

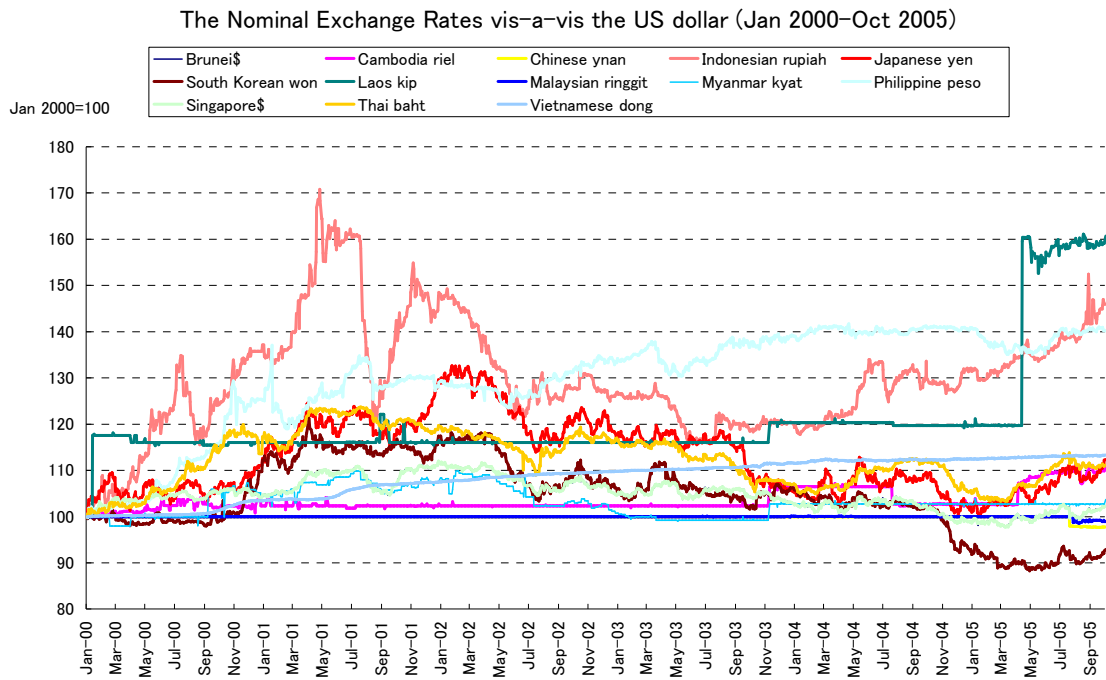


Figure 2.

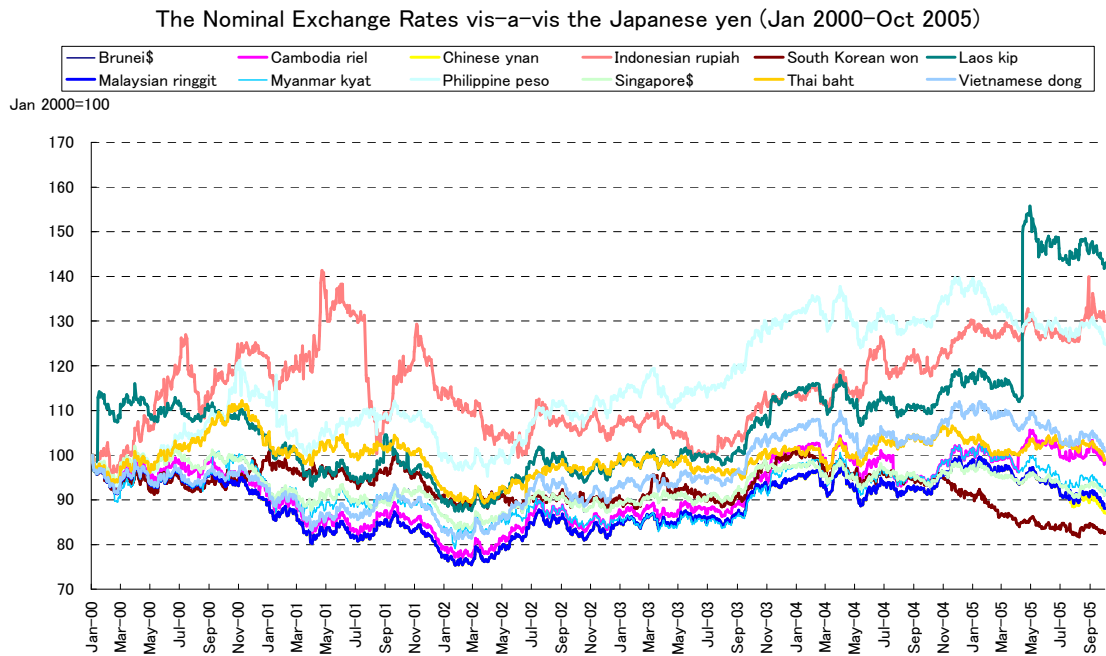


Figure 3.

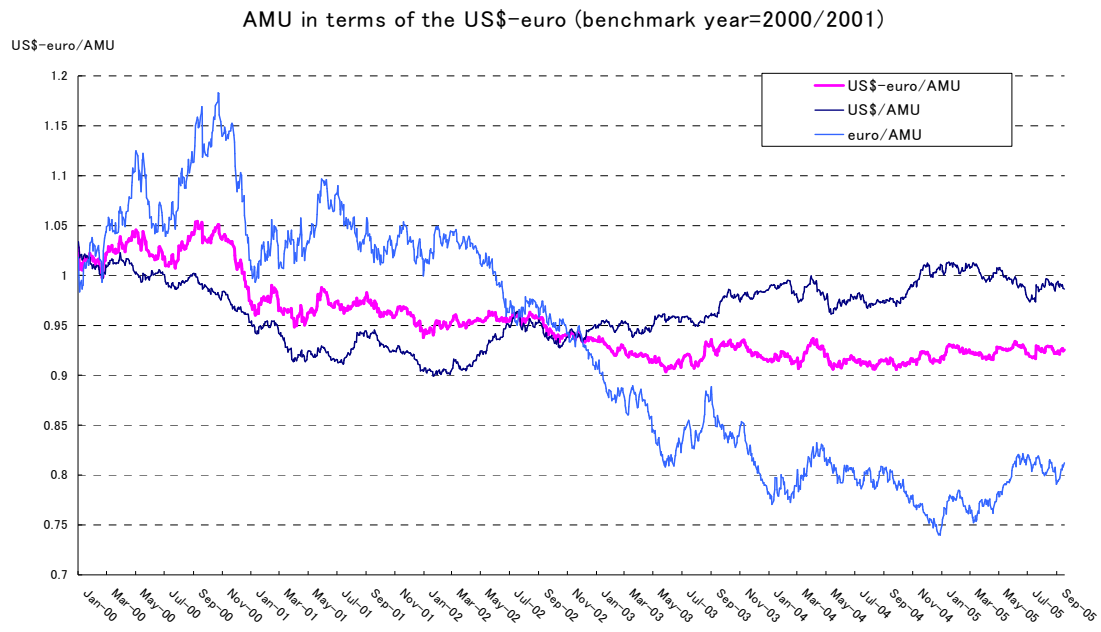


Figure 4.

