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A Role of the Japanese yen in a Multi-step Process

toward a Common Currency in East Asia

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Abstract

The ASEAN + 3 (China, Japan, and Korea) Financial Ministers' Meeting established the Chiang Mai Initiative (CMI) to strengthen a regional financial cooperation in East Asia. A surveillance process under the CMI is important for a purpose of preventing a currency crisis while a network of bilateral currency swap agreements are contributed to managing currency crises. The ASEAN + 3 Financial Ministers' Meeting organized a research group who studied a Regional Monetary Unit (RMU) for surveillance over exchange rates. Deviation Indicators of each of East Asian currencies based on the RMU should be useful for the surveillance over misalignment of the intra-regional exchange rates among East Asian currencies. The RMU might be a first step toward a single common currency in East Asia in the long-term future while we have to take gradual and multi-step process toward it. This paper is to consider a multi-step process toward a common currency in East Asia as well as the RMU as the first step. Moreover, it considers a role of the Japanese yen in the multi-step process.

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1. Introduction

Under the Chiang Mai Initiatives (CMI), a network of bilateral currency swap arrangements has been developed among ASEAN + 3 (China, Japan, and Korea) in order to manage a currency crisis in East Asia in the future. This is regarded as a form of regional financial cooperation in East Asia. The CMI are expected to give the East Asian countries momentum to activate policy dialogues in a field of regional monetary arrangements among the countries. The regional monetary arrangements will include a common currency area in East Asia in the future. Accordingly, a regional monetary integration is expected to be an important topic in policy dialogue among East Asian countries in the future.

Our experience of the Asian currency crisis gives us an important lesson that *de facto* dollar peg was dangerous for East Asian countries that have strong economic relationship with not only the United States but also Europe and intra-regional countries. The *de facto* dollar peg was one of the important factors that caused the currency crisis in East Asian countries because it accelerate fluctuation of exchange rates against all of the currencies except for the US dollar although it contributed to stabilization of the exchange rate against the US dollar. It follows that if we establish a common currency area in East Asia, we should create a common currency that has linkages with not such a single major currency as the US dollar but a currency basket composed of several outsiders' currencies. The currency basket may be composed of mainly the US dollar and the euro.

On one hand, the EU has created a single common currency, the euro, which was based on the European Currency Unit (ECU). In the case of the ECU, member country currencies were linked with the ECU consisted of the member country

currencies while the ECU was floating against the US dollar and the Japanese yen. The common currency for East Asia would be a basket currency which is consisted of intra-regional currencies or East Asian currencies if East Asian countries followed the European experience to adopt a multi-step approach toward a common currency in East Asia.

When we consider a common currency area in East Asia, we should investigate whether East Asia is an optimum currency area. Bayoumi, Eichengreen, and Mauro (2000) used a structural VAR model to conduct an empirical analysis on an optimum currency area in East Asia. On the other hand, Kawasaki and Ogawa (2006) and Ogawa and Kawasaki (2008) used a Generalized Purchasing Power Parity (G-PPP) model to analyze the issue. We explain analytical results based on the latter method to investigate which part of East Asia will be able to create a common currency region while we specify what is used as an anchor currency.

This paper consists of the following sections. Next section places stress on creation of a common currency basket for East Asian counties in order to resolve a kind of coordination failure in exchange rate policies among East Asian countries. In section 3, we overview the trade linkage among East Asian countries and refer the current progress of FTA agreements. In section 4, we review the feasibility of a common currency area in East Asia. We explain an empirical analysis on the possibility of optimum currency area for East Asia conducted by Ogawa and Kawasaki (2008) in section 5. In section 6, we consider how to promote a common currency basket system to an Asian Currency Union. We suggest steps toward a common currency basket system in East Asia in Section 7. In the final section, we summarize our consideration on an Asian currency union.

2. Coordination failure in exchange rate polices

Some empirical researches found that a currency basket system would contribute to stabilizing trade balances and capital flows for East Asian countries. Ito, Ogawa, and Sasaki (1998) estimated optimal weights on the US dollar and the Japanese yen in a currency basket, which stabilize fluctuations of trade balances for East Asian countries before the Asian currency crisis. Results of the estimation showed that the optimal weights on the US dollar were smaller than their actual weights that were estimated by Frankel and Wei (1994) and Kawai and Akiyama (1998). It implies that it was not a *de facto* dollar peg system but a currency basket peg system that would have stabilized fluctuations of their trade balances.

Ogawa and Sun (2001) simulated capital inflows to three crisis-hit countries, which include Thailand, Indonesia, and Korea, under a currency basket peg system where weights on the US dollar and the Japanese yen had been 50%: 50% in a currency basket. Results of the simulation concluded that the *de facto* dollar peg system stimulated capital inflows to the crisis-hit countries before the Asian currency crisis.

We should consider why the monetary authorities of East Asian countries tended to choose a *de facto* dollar peg system rather than a currency basket peg system. In fact, linkages of East Asian countries to the US dollar recently have returned to as high level as before the Asian currency crisis as McKinnon (2000) and Ogawa (2002) pointed out. A reason why the monetary authorities are unwilling to adopt a currency basket peg system is related with a kind of coordination failure.[1]

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[1] Bénassy-Quéré (1999) and Ohno (1999) analyzed how the monetary authorities peg

Ogawa and Ito (2000) used a two-country model to examine theoretically an optimal exchange rate regime for East Asian countries that export goods to the United States, Japan, and neighboring countries in order to minimize fluctuations of their trade balances, in the situation where the yen-dollar exchange rate fluctuates. It was shown how an East Asian country's choice of the exchange rate regime (or weights in the currency basket) is dependent on the neighboring country's. The dollar weights in the currency baskets of the two countries are determined as a Nash equilibrium. In general, there are multiple equilibriums and moreover a "coordination failure" may result in a situation.

Suppose that all of the monetary authorities in East Asian countries, in fact, have kept the *de facto* dollar peg system. Consequently, the exchange rates of their home currencies vis-à-vis the US dollar have been kept almost fixed while the exchange rates of the home currencies vis-à-vis other major currencies which include the Japanese yen have been fluctuating. On one hand, if the monetary authorities of a country shift their exchange rate policy from the *de facto* dollar peg system to a currency basket peg system, the currency basket peg system increase a fluctuation of the exchange rate of the home currency vis-à-vis the US dollar while it reduces a fluctuation of the exchange rate of the home currency vis-à-vis the Japanese yen.

In a case where the US dollar appreciates against the Japanese yen, the home currency also appreciates against the Japanese yen while the exchange rate of the home currency vis-à-vis the US dollar is kept fixed under the dollar peg system. On the other hand, the home currency appreciates against the Japanese yen less widely

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the home currency to the US dollar as a result of a coordination failure.

while the home currency depreciates against the US dollar under the currency basket peg system. Therefore, an appreciation of the US dollar against the Japanese yen makes the home currency appreciate more widely under the dollar peg system than under the currency basket peg system.

In contrast, in a case where the US dollar depreciates against the Japanese yen, the home currency also depreciates against the Japanese yen while the exchange rate vis-à-vis the US dollar is kept fixed under the dollar peg system. On the other hand, the home currency depreciates against the Japanese yen less widely while the home currency appreciates against the US dollar under the currency basket peg system. Therefore, a depreciation of the US dollar makes the home currency depreciates more widely under the dollar peg system than under the currency basket peg system.

If there were certainty about future movements in the exchange rates, all of the monetary authorities would have a rational expectation that they do the same behavior. If it were certain that the US dollar appreciates against the Japanese yen in the future, all of the monetary authorities in East Asian countries would have no hesitation about shifting their exchange rate policy to a currency basket peg system. On the other hand, if it were certain that the US dollar depreciates against the Japanese yen in the future, they would have no hesitation about maintaining the dollar peg system.

However, there is, in reality, an uncertainty about the future movements in the exchange rate of the US dollar vis-à-vis the Japanese yen. Suppose that alone the monetary authorities of a country shift their exchange rate policy to the currency basket peg system while the other monetary authorities of the neighbor countries

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keep the dollar peg system. A currency of the country that adopted the currency basket peg system would appreciate against the currencies of the neighbor countries if the US dollar depreciated against the Japanese yen. Therefore, under such an uncertainty, the monetary authorities tends to work out a strategy to "wait and see" if they are averse to risk.

All of the monetary authorities are likely to take such a strategy to "wait and see" if they are all risk averse. The situation is a so-called prisoner's dilemma in a game theory. All of the monetary authorities cannot help but choose to keep the dollar peg system, which means a Nash equilibrium, even though they should know that there is a better cooperative solution. Coordination among some of the monetary authorities in East Asian countries is necessary for shifting the situation from the Nash equilibrium to a cooperative solution.

A form of coordination is international policy coordination for arrangements of international monetary system. For example, all of the monetary authorities of the countries in a regional area might agree on an arrangement that they create a common currency that consists of a currency basket. They might make references to the common currency in conducting their exchange rate policy. A rigid arrangement is that all of the monetary authorities in the regional area peg their home currencies to the common currency basket. On one hand, one of more flexible arrangements is that they target the home currencies in a wider band around a central exchange rate of the home currencies vis-à-vis the common currency basket.

In either case, it is necessary to create a common currency basket that the monetary authorities of these countries make reference to when they conduct their exchange rate policies. Such regional currency arrangements might help to prevent

competitive devaluation among the related currencies in a region. If the monetary authorities of a country devalue its home currency, the devaluation worsens price competitiveness of products made in neighbor countries. For that reason, the monetary authority of the other countries should have an incentive to devalue their home currency, following the first country's devaluation. The regional currency arrangements that the monetary authorities in a region make a commitment to a coordinated exchange rate policy of making references to a common currency basket would prevent a possible competitive devaluation.

3. Trade linkage and FTA among East Asian countries

Here, we overview current trade linkage and recent movements of Free Trade Agreement within the region.

Tables 1 and 2 show the share of trade volumes (a sum of imports and exports) of ASEAN 10 plus 4 (Japan, China, Korea and Hong Kong) by region in 2000 and 2007, respectively. The average share of intra-regional trade volumes in East Asia increased from 53.4 percent in 2000 to 58.4 percent in 2007. In all East Asian countries, except China and Vietnam, their intra-regional trade share became larger.[2] Besides, the average of trade weights of the East Asian countries with the United States decreased from 15.8 percent in 2000 to 10.6 in 2007. The average of trade weights of the East Asian countries with EU countries also decreased from 12.8 percent in 2000 to 10.5 in 2007. These results indicate that the intra-regional trades are becoming more important in East Asia.

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[2] Hong Kong has long been a major entrance of Chinese trade. Trade data related to China and Hong Kong are largely affected by Chinese re-export structure through Hong Kong.

The ASEAN countries, Japan, Korea, and China suggested establishing an East Asia Free Trade Area in the ASEAN + 3 (China, Japan, and Korea). Bilateral and regional free trade agreements are complementary to a multilateral trade arrangement represented by the WTO. It is expected that bilateral free trade agreements among East Asian countries would strengthen not only their trade relationships, but also their capital relationships. Economic agents in East Asian countries should face in foreign exchange risks of their bilateral exchange rates that impede international trade transactions and direct investments even after we remove tariff and non-tariff barrier under free trade agreements.

Japan has promoted both bilateral and multilateral regional free trade agreements with East Asian countries. In April 2008, ASEAN countries and Japan have completed the signing of the ASEAN-Japan Comprehensive Economic Partnership (AJCEP). The AJCEP is comprehensive in scope, covering such fields as trade in goods, trade in services, investment, and economic cooperation. It is expected that the AJCEP will provide a strong impetus for further invigoration of trade and investment in the region. As well as the multilateral regional FTA talk, Japan has promoted the bilateral EPA agreement, too. Table 3 shows the Achievement of EPA between Japan and Asian countries so far.

These movements toward bilateral and regional free trade agreements might gain momentum to form a common currency area in East Asia if East Asian countries have an international cooperation to stabilize bilateral exchange rates among the countries in an international monetary field. For example, if the free trade agreements include a clause that government and private sectors in East Asia should make efforts to use their own currencies in their trade and financial

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transactions, the clause might gain momentum to depart from a situation of using exclusively the US dollar as a settlement currency in their transactions. Moreover, East Asian countries have another international monetary cooperation that they can try to create a foreign exchange market for East Asian currencies.

Thus, governments of East Asian countries should try to have bilateral and regional free trade agreements with many other countries in East Asia including the international monetary cooperation that contributes to gaining momentum to form a common currency area in East Asia. The free trade agreements are expected to contribute to movements toward an Asian currency union through strengthening trade and financial relationships among East Asian countries as well as through the direct international monetary cooperation.

4. Common currency basket for East Asian countries

So far we have suggested that East Asian countries should try to resolve the coordination failure in exchange rate policies. It is one of the solutions that East Asian countries should form a currency union where economic agents use a common currency basket as a single common currency unit. Here we consider feasibility of a common currency area in East Asia by taking into account the demerits of an international monetary integration that we pointed out in the previous section.

What are conditions where we can use a common currency basket among some countries? It is clear that optimal weights on currencies in a currency basket should be almost the same among the counties. The first condition is related with the "optimality." It is necessary that the monetary authorities have same objectives of their exchange rate policy among the countries. There is controversy as to whether

the monetary authorities have same objectives of their exchange rate policy among the countries. In an academic literature we can find different view on what objectives the monetary authorities should have in conducting their exchange rate policy.

One of the objectives is to stabilize the real effective exchange rate (Lipschitz and Sundrarajan (1980)). The objective implicitly implies that the trade balance is stable as long as the monetary authorities keep the exchange rate stable around the equilibrium. Another objective is to keep the balance of trade or current accounts at an optimal level, or to stabilize the trade or current balances (Flanders and Helpman (1979) and Flanders and Tishler (1981)). Turnovsky (1982) proposed that the objective was to stabilize domestic income that was a more general objective of economic policy. For domestic income stabilization, there are policy options other than the currency basket weights. Bhandari (1985), extending Turnovsky (1982) considered four criteria or a combination of thereof at the same time. The four criteria are domestic price-output stability, stability of the domestic prices, reserve stock stability, and stability of an external competitiveness.

Moreover, it is a question what objectives the monetary authorities in fact have in conducting their exchange rate policy. They might have objectives that are different from that supposed in the academic literature. The monetary authorities might have adopted the dollar peg system with an objective that they attract the US dollar denominated foreign capital to the domestic direct and portfolio investments. They might have been unable to devalue the home currency against the US dollar because the economy had a large amount of the US dollar denominated foreign liabilities.

The second condition is that trade patterns are similar among the countries in a currency area in some points, given that an objective of the exchange rate policy is to stabilize their trade balances. As Ito, Ogawa, and Sasaki (1998) pointed out, optimal weights of currencies in a currency basket depend on shares of the relevant countries in total exports and total imports and their price elasticities. Therefore, it is necessary that the shares and the elasticities of exports and imports are similar among the countries in a currency area.

Kwan (2001) pointed out that some East Asian country economies are competitive with the Japanese economy in trade structures while other East Asian country economies are complementary to the Japanese economy. The competitive relationship means that export products made in an East Asian country compete with those made in Japan. On one hand, the complementary relationship means that an East Asian country economy imports capital goods, raw materials, or parts of machine from Japan. If the home currency of the country that competes with the Japanese economy depreciated against the Japanese yen, it would improve price competitiveness of export products made in the relevant country. On the other hand, if the home currency of the country that is complementary to the Japanese economy depreciated against the Japanese yen, it would increase their import prices in terms of the home currency and, in turn, production costs.

5. Possibility of optimum currency area for East Asia

First, economies would face in costs if a currency union would be formed in a situation where they do not satisfy conditions for an optimum currency area. The economies needs costs related with asymmetric shocks because they cannot adjust

any asymmetric shocks by making realignments of exchange rates forever. Asymmetric shocks change their terms of trade among countries in a currency union. In this situation, the economies would be forced to adjust through changes of prices. Some countries would receive deflationary pressures while other countries would receive inflationary pressures. Especially, the deflationary countries would face in reduction in GDP. This would, in turn, increase unemployment in the countries in a situation of international labor immobility and downward stickiness of wage rates.

Next, according to the optimum currency area theories, feasibility of a common currency area in a region depends on whether the region is an optimum currency area or not. It is pointed out in the optimum currency area theories that some factors determine an optimal currency area. Mundell (1961) regarded mobility of labor as a necessity of common currency area while McKinnon (1963) regarded openness of economy as another necessity. Moreover, symmetry of shocks was pointed out as a factor for optimal currency area (Bayoumi and Eichengreen (1993)). It is possible to form an optimal currency area because it is unnecessary to make intra-regional adjustments in a region where symmetric shocks happen. Symmetry of supply shocks is focused on because supply shocks have long run effects on GDP while demand shocks have no long run effects on GDP in a situation where the natural unemployment hypothesis holds. The supply shocks mean ones that have effects on production function like productivity shocks and oil price shocks.

Bayoumi, Eichengreen, and Mauro (2000) conducted an empirical analysis on an optimum currency area in East Asian region[3]. Correlations were relatively

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[3] Zhang, Sato, and Mcaleer (2004) used a similar structural VAR method to investigate

higher among Malaysia, Indonesia, and Singapore. Also, a correlation was higher between Singapore and Thailand. Therefore, these ASEAN four countries might be able to form an optimal currency area. Moreover, a supply shock in Japan has a positive correlation with that in Taiwan, Korea, and Australia. On one hand, it has lower correlation with ASEAN countries except for Thailand.

Kawasaki and Ogawa (2006) and Ogawa and Kawasaki (2008) used a Generalized Purchasing Power Parity (G-PPP) model[4] to analyze an optimum currency area for East Asia. The G-PPP model is extended from a simple PPP model by taking into account a fact that it is difficult to hold PPP because frequently-occurred nominal and real shocks continuously have effects on macro fundamentals. It is assumed in the G-PPP model that there are common factors among some bilateral real exchange rates of the home currency vis-à-vis currencies of foreign countries that the home country has strong economic relationships with. Thus, the real exchange rates have a stable equilibrium in the long run.

The G-PPP model-based analysis on optimum currency area has common characteristics with the VAR model-based analysis by Bayoumi and Eichengreen (1993) and Bayoumi, Eichengreen, and Mauro (2000). Both of the analyses implicitly compared fluctuation patterns of outputs and, in turn, real exchange rates among the countries. However, symmetry of supply shocks focused by the VAR model-based analysis is no more than a sufficient condition for an optimum currency area. Asymmetric shocks do not always prevent countries from forming a currency union or participating in it. Countries that face in asymmetric shocks form a currency union if any other factors can adjust disequilibria among their

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an optimal currency area for East Asia.
4 The G-PPP theory was developed by Enders and Hurn (1994).

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economies.

Ogawa and Kawasaki (2008) used the dynamic OLS (DOLS) to estimates the cointegrating vector given that several linear combinations which had cointegration relationships were found for the basket weight on three major currencies in advance. The cointegrating vector with endogenous weights in the common currency basket were estimated specifically for ASEAN 5, ASEAN 5 + China, ASEAN 5 + Japan, ASEAN 5 + Korea, , ASEAN 5 + China + Japan, ASEAN 5 + China + Korea, ASEAN 5+ Japan + Korea, and ASEAN 5 + Korea + China + Japan.

The sample for the empirical tests covers a period between January 1987 and November 2005. Apparently, the sample period includes the data in the period of the Asian currency crisis. The sample period are divided into a "pre-crisis" period from January 1987 to June 1997 and a "post-crisis" period from January 1999 to November 2005. The analysis was conducted for each of eight East Asian countries (Korea, Singapore, Malaysia, Thailand, the Philippines, Indonesia, China, and Japan. The real exchange rates were based on the monthly data of nominal exchange rates and consumer price indices of the related countries.[5] The prior euro was calculated to estimate before 1997 crisis.[6] These data are from the IMF, *International Financial Statistics* (CD-ROM).[7]

Table 4 shows the result of the DOLS for the pre-crisis period (from January 1987 to June 1997). In the pre-crisis period, we could not find any combinations which all the coefficients indicated the significant result among the variables for

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[5] For the prior euro real exchange rates, we calculated a GDP-weighted average of CPI

[6] The method of calculation of the prior euro is provided by the PACIFIC Exchange rate service of The University of British Colombia (http://fx.sauder.ubc.ca/)

[7] The Chinese consumer price index is provided by Yu Yongding, the Chinese Academy of Social Sciences (CASS). We use the official RMB exchange rate in IFS.

both of rank conditions. While we could find the combinations which three or four countries could conduct a common exchange rate policy with reference to a common currency basket composed of three major currencies, we could not assure the existence of cointegrating vectors in the combinations which included more than five countries in our earlier works. In the most of cases, the Japanese yen was excluded from the possible currency area as the rank condition was $r = 1$. The euro might be excluded from the basket if we looked at the cases that the rank condition was $r = 2$. While we could find significant results for the combination, Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Korea, while the US dollar and the Japanese yen worked as an outsider currency in the basket, the euro might be excluded from the currency basket as well as other combinations. The *de facto* dollar peg exchange rate system before the crisis might draw a sharply contrast to much fluctuation against the Japanese yen or the euro.

Table 5 shows the result of the DOLS for the post-crisis period (from January 1999 to November 2005). All test statistics for the rank condition: $r = 1$ indicated significant for the combination: ASEAN 5 + Japan, ASEAN 5 + Korea + Japan, ASEAN 5 + China + Japan. On the other hand, test statistics for $r = 2$ indicated insignificant in most cases. It means that the Japanese yen should be included in the region as the currency which leads the other East Asian currency stable in the long run. East Asian countries including Japan seem to satisfy the conditions of optimum currency area in resent years. While test statistics reported here were dramatically changed from that of post crisis period, these results is consistent with the recent developments of integration in the region because East Asian countries have been deepening the inter-relationship in terms of international trade, foreign

direct investments, and international finance for 1999-2005.

Thus, Ogawa and Kawasaki (2008) obtained the analytical results that there were only the combinations which three or four countries could conduct a common exchange rate policy with reference to a common currency basket composed of three major currencies in the pre-crisis period. In the post-crisis period (from January 1999 to November 2005), combinations such as ASEAN 5 + Japan, ASEAN 5 + Korea + Japan, ASEAN 5 + China + Japan are an area that the monetary authorities can conduct a common exchange rate policy with reference to the common currency basket. Thus, we obtained the analytical results that the Japanese yen should be included as an endogenous variable in the long run relationship as well as other East Asian currencies while the Japanese yen worked exogenously as well as the US dollar and the euro in the system composed of the East Asian currencies. It implies that it is increasing the possibilities of success in adopting the common currency basket arrangement into the ASEAN + 3 countries that include Japan.

6. From a common currency basket to an Asian currency Union

A common currency basket should be composed of currencies of trading partner countries, given that the objective is to stabilize its real effective exchange rate and, in turn, its trade balances. A common currency basket for the East Asian countries might be in fact composed of the US dollar, the Japanese yen, the euro, and neighbor country currencies from a viewpoint of their trading partner. Under a common currency basket system, the monetary authorities of countries peg or target their home currencies to a common currency basket.

In a rigid system where the monetary authorities peg their home currencies to a common currency basket, the currencies are pegged with each other. In a more flexible system where they target their home currencies within an exchange rate band around a central parity rate against the common currency basket, the currencies are linked to each other within an exchange rate band. Thus, if they adopted a common currency basket 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 with the common currency basket. For the East Asian countries, a common currency unit might be composed by the US dollar, the Japanese yen, and the euro as well as the home currencies of the participating countries (Ito, Ogawa, and Sasaki (1998)). The EU countries adopted the European Monetary System that their home currencies were linked to a common currency unit, which is called as the ECU, during a period from 1979 to 1998. The ECU is composed by only their home currencies of the EMS member countries. Their home currencies were linked to the ECU with an exchange rate band. The monetary authorities had obligation to intervene foreign exchange markets in order to keep exchange rates of the home currency against the other EMS currencies within an exchange rate band. On one hand, the ECU was floating against the other major currencies that included the US dollar and the Japanese yen.[8]

A method of adopting a common currency basket system is that the monetary authorities create a common currency unit which consists of home currencies of

[8] Kim, Ryou, and Wang (2000) suggested that the Asian Currency Unit was composed of only the East Asian currencies including the Japanese yen.

member countries like the ECU and link their home currencies to the common currency unit. Moreover, they link the common currency unit to a currency basket consisted of the US dollar, the Japanese yen, and the euro. This is a two-stage linkage method.

The monetary authorities of the participating countries have obligation to intervene in foreign exchange markets in order to link their home currencies to the common currency unit and, in turn, link their home currencies to each other. At the same time, the monetary authorities of the participating countries might coordinate to intervene in foreign exchange markets in order to link the common currency unit to a currency basket that is composed by the US dollar and the Japanese and so on. Such an intervention is complicated for the monetary authorities. If the participating countries established an intra-regional institution, it could intervene in foreign exchange markets in order to link the common currency unit to a currency basket on behalf of the monetary authorities of the participating country.

Another method is that they create a common currency unit consisted of outside currencies such as the US dollar and the euro as well as their regional home currencies and link directly their home currencies to the common currency unit. This is a direct linkage method. The monetary authorities of the participating countries have an obligation to intervene directly in foreign exchange markets in order to link their home currencies to the common currency unit. In this case it is more difficult to calculate a common currency unit consisted of the US dollar, the Japanese yen, and the euro as well as their regional home currencies

The two methods might be, in theory, equivalent with each other. However, which method should be adopted depends on their implementation. It would be

easier for the monetary authorities of each country to implement the two-step linkage method if they could establish an intra-regional institution for the participating countries. The monetary authorities of the participating countries would target the home currencies to the common currency unit.

Next step is to go forward to a currency union. Why should we go forward to a currency union in East Asia? What benefits do we expect in a region monetary integration?

One of the benefits of regional monetary integration is to save transaction costs accompanied with exchanges of different currencies.[9] Economic agencies need to spend transaction costs to exchange different currencies in a situation where they use their home currencies as a medium of exchange in a region. An international monetary unification would save this kind of transaction costs. Moreover, network externalities work in a sense that a function of money as a medium of exchange works better the fewer currencies economic agents uses as a medium of exchange. As for a function as a value measure, fewer currencies in a region would make a function of value measure more efficient.

East Asian countries have their own home currencies that the monetary authorities link to the currency unit before they achieve a regional monetary integration. This situation implies that there leave possibility for the monetary authorities to realign exchange rates of the home currencies vis-à-vis the common currency unit or to quit linking their home currencies to the common currency unit. The possibility might induce speculators to make speculative attacks against weaker currencies. It is one option for the monetary authorities to make a strong

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[9] De Grauwe (1992) summarized merits and demerits of international monetary integration.

commitment to link their own home currencies to the common currency unit.

The strongest commitment is to participate in a currency union where the monetary authorities of the participating countries have no option to leave from it. The strongest commitment would contribute to stability of exchange rate regimes because the monetary authorities build up their confidence from private economic agents. The monetary authorities can make the strong commitment to solve the so-called peso problem that means that future possibility of exchange rate collapse increase domestic interest rates in terms of their home currencies through expected depreciation and risk premium. Accordingly, a currency union contributes to decrease in domestic interest rates in terms of the home currencies.

Moreover, in recent years, world economy has a trend to make bilateral and regional free trade agreements parallel with the WTO system. Movements toward the free trade area contribute to elimination of some trade obstacles that includes tariffs and non-tariff barriers. However, economic agents would regard exchange rate risks as an important trade obstacle after they conclude free trade agreements with several countries. Even though we use forward contracts to avoid exchange rate risks, we have to pay some costs for avoiding the exchange rate risks. This is a kind of transaction costs. In the situation we would face in increased necessity to eliminate exchange rate risks and the related transaction costs. Economic agents would face in no exchange rate risks in a situation of a common currency union under the strong commitment of future keeping linking their home currencies against the neighbor countries' currencies.

7. Steps toward a further regional monetary cooperation in East Asia and

the role of the Japanese yen

We consider steps toward further regional monetary cooperation in East Asia. We have to consider whether the Japanese yen should be an insider or an outsider for the further regional monetary cooperation and specifically a regional monetary unit as a concreteness of the regional monetary cooperation. We expect that the Japanese yen should play a varying role at each stage toward regional monetary coordination in East Asia.[10]

In the first step, the monetary authorities of ASEAN+3 start policy dialogue about exchange rates and exchange rate policies. At that time, the RMU and RMU deviation indicator should be used to conduct surveillance on the exchange rates and exchange rate policies as well as domestic macroeconomic policies at the Economic Review and Policy Dialogue (ERPD) of ASEAN+3 Financial Deputy Minister' Meeting. The surveillance process based on the RMU must be conducted by all of ASEAN + 3 which includes Japan. Accordingly, the Japanese yen should be included in the RMU.

In the second step, the monetary authorities of ASEAN+2 (China and Korea) will adopt a managed floating exchange rate system with reference to their own individual G3 currency baskets for managed floating countries. On one hand, the monetary authority of Japan might not be included in adopting a G3 currency basket system because it is difficult for it to have effective intervention in such a thick foreign exchange market such as dollar/yen market. At the same time, the monetary authorities of ASEAN+3 should continue to conduct the surveillance process by using the RMU deviation indicators.

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[10] Ogawa and Shimizu (2007).

In the third step, the monetary authorities of ASEAN+2 will shift to a managed floating exchange rate system with reference to a common G3 currency basket for managed floating countries. At the same time, the monetary authorities of ASEAN+3 should continue to conduct surveillance by using the RMU deviation indicators. In the second and third steps, the Japanese yen is one of the G3 currencies that the monetary authorities of ASEAN+2 target in conducting their exchange rate policies.

In the fourth step, some ASEAN+3 countries (what we call "core countries") would peg to a common regional currency basket, the RMU, in order to stabilize intra-regional exchange rates. They should conduct coordinated monetary policies in order to stabilize intra-regional exchange rates. At that time, the core countries should be limited to those that adopt the RMU peg system.

In the fifth step, some of ASEAN+3 would introduce a bilateral grid method based on the RMU to conduct a certain amount of intervention in foreign exchange markets of the relevant intra-regional exchange rates. An Asian Exchange Rate Mechanism should be established for their coordinated intervention. This is similar to the Exchange Rate Mechanism under the EMS prior to the introduction of the euro.

In the fourth and fifth steps, the currency basket should include the Japanese yen as an anchor currency. In this case, the Japanese yen should be a regional key currency in terms of its being a main international currency with convertibility and conducting disinflationary stance of monetary policy. East Asian currencies should be linked to a regional anchor and key currency such as the Japanese yen to stabilize their values and prevent a currency crisis. During the course of future

monetary union in East Asia, the composition currencies of RMU should be convertible not only for their current account transactions, but also their capital account transactions. In addition, their trade volumes or liquidity in foreign exchange markets also should be relatively high. At the moment, the Japanese yen is only the currency which can be freely traded for non-resident investors without any restrictions. Both foreign exchange markets of the Japanese yen and the Japanese yen-denominated bond markets in Japan have higher liquidity compared with those in other East Asian countries.

It is expected that the RMU could be used not only by the monetary authorities but also by private sectors. Dammers and McCauley (2006) and Iwata (2005) indicated that development in private ECU in the financial field begun in the early 1980's and developed rapidly. Similar to the ECU, the RMU might be used to denominate regional capital transactions. Iwata (2005) indicated that there were still rooms for the private RCU composed of main Asian currencies to develop.[11] Then, we could start an RMU composed of only core currencies in the region if we expect an RMU as a same role like ECU. If we name it "core-RMU", the criteria to be a composition currency of "core-RMU" should be considered.

For example, Ogawa and Shimizu (2005) proposed an Asian Monetary Unit (AMU) as a weighted average of thirteen East Asian currencies (ASEAN10 plus Japan, China, and Korea) to enhance the monetary authorities' surveillance capacity in East Asia.[12] At the same time, Ogawa and Shimizu (2006) created a

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[11] Iwata (2005) explained that the reason for this prospects were from the lack of convergence of interest rate and inflation rate within Asian and some restrictions of capital movements in some Asian countries. He indicated that these circumstances are similar to that of early development of private ECU from 1979 to 1987.

[12] See Appendix: the data of AMU are published on website of the Research Institute of Economy, Trade and Industry (RIETI, http://www.rieti.go.jp/users/amu/en/index.html).

core-AMU currency basket, which is composed of some regional currencies with convertibility in both current and capital accounts, for the private usage especially in Asian bond markets. In Ogawa and Shimizu (2006), the criteria to choose composition currencies of core-AMU are indicated. Due to Table 6, only five East Asian currencies are selected for core-AMU currencies. Table 7 shows the basket weights of core-AMU. Among them, the Japanese yen's share is 58 percent, which is the highest basket weight. The core-AMU is expected to be a denomination currency of Asian bond, which might play an important role for investment diversification in the region. Since the core-AMU denominated Asian bond is supposed to be a stable investment choice especially for the Japanese investors, we expect that the Japanese yen and the Japanese investors will play an important roll to create and promote a core-AMU denominated Asian bond market.

8. Conclusion

This paper suggested that it is necessary to make a regional coordination in exchange rate policy in order to resolve coordination failure in adopting optimal exchange rate policy. From this point of view, it follows that we will create a regional currency union in East Asia in the future. Moreover, a common currency should be related with a common currency basket which consists of intra-regional currencies. The European experiences of the ECU provide us with useful information in considering a common currency unit in East Asia. In the case of East Asian countries, we have international trade relationship with variety of regions that include the intra-region, the United States, and the EU. Therefore, a possible common currency unit in East Asia would consist of intra-regional currencies while

it is to consider stability of value of the common currency unit against the US dollar and the euro. It is contrast with the ECU case where the ECU was freely floating against the US dollar.

However, it may be questionable to create the Asian Currency Union in the near future. We face in difficulties in feasibility of a common currency area in East Asia. We pointed out two factors: possibilities of regional policy cooperation and an optimum currency area. Needless to say, the monetary authorities have to intend to make policy coordination as a premise that they create a common currency area. It is difficult for them to make regional policy coordination unless they have common policy objectives. Especially, it is important that they have common objectives in monetary and exchange rate policies in order to create a common currency area.

Another factor is whether East Asia is an optimum currency area or not. Both the structural VAR model and the Generalized Purchasing Power Parity (G-PPP) model obtained the analytical result that some of South East Asian countries will be able to create a common currency area. However, it is, for the moment, difficult for all of the East Asian countries to create a common currency area. Of course, because the results were obtained from the past data, we should not extrapolate future situation from the results. East Asia might be one common currency region in the future.

References

Bayoumi, T. and B. Eichengreen (1993) "Shocking aspects of European monetary integration," in Francisco Torres and Francesco Givavazzi eds., *Adjustment and*

Growth in the European Monetary Union, Cambridge University Press, 193-229.

Bayoumi, T., B. Eichengreen, and P. Mauro (2000) "On regional monetary arrangements for ASEAN," *CEPR Discussion Paper*, No.2411.

Bénassy-Quéré, A. (1999) "Optimal pegs for East Asian currencies," *Journal of the Japanese and International Economies*, vol. 13, 44-60.

Bhandari, J. S. (1985) "Experiments with the optimal currency composite," *Southern Economic Journal*, vol. 51, no. 3, 711-730.

Dammers, Clifford R. and Robert N. McCauley, 2006, "Basket weaving: the euromarket experiences with basket currency bonds," *BIS Quarterly Review*, March 2006, p.79-p.92.

De Grauwe, P. (1992) *The Economics of Monetary Integration*, Oxford University Press, Oxford.

Dornbusch, R. (2001) "Fewer monies, better monies," *American Economic Review*, vol.91, no.2, 238-242.

Enders, W. and S. Hurn (1994) "Theory and tests of generalized purchasing-power parity: Common trends and real exchange rates in the Pacific Rim", *Review of International Economics*, vol. 2, no. 2, 179-190.

Flanders, M. J. and E. Helpman (1979) "An optimal exchange rate peg in a world of general floating," *Review of Economic Studies*. 533-542.

Flanders, M. J. and A. Tishler (1981) "The role of elasticity optimism in choosing an optimal currency basket with applications to Israel," *Journal of International Economics*, vol. 11, 395-406.

Frankel J. A. and S. Wei (1994) "Yen bloc or dollar bloc? Exchange rate policies of

the east Asian economies," in T. Ito and A. O. Krueger, eds., *Macroeconomic Linkage: Savings. Exchange Rates and Capital Flows*, Chicago, University of Chicago Press, 295-355.

Ito, T., E. Ogawa, and N. Y. Sasaki (1998) "How did the dollar peg fail in Asia?" *Journal of the Japanese and International Economies*, vol. 12, 256-304.

Ito, T., E. Ogawa, and N. Y. Sasaki (1999) "A regional currency system in East Asia," *Stabilization of Currencies and Financial Systems in East Asia and International Financial Cooperation*, Institute for International Monetary Affairs.

Iwata, K., 2005, "Formation of regional financial and currency area: Some lessons from Europe to Asia," 3rd Conference of EUSA-AP, 10 December 2005.

Johansen, S. and K. Juselius (1990) "Maximum likelihood estimation and inference on cointegration; with application to the demand for money", *Oxford Bulletin of Economics and Statistics*, vol. 52, no. 2, 169-210.

Kawai, M. and S. Akiyama (1998) "The role of nominal anchors currencies in exchange arrangements," *Journal of the Japanese and International Economies*, Vol. 12, pp.334-387.

Kawasaki, K and E. Ogawa (2006) "What should the weights of the three major currencies be in a common currency basket in East Asia?" *Asian Economic Journal*, Vol.20, No.1, 75-94.

Kenen. P. B. (1969) "The theory of optimal currency area: An eclectic view," in R. Mundell and A. K. Swoboda eds., *Monetary Problems of the International Economy*, University of Chicago Press.

Kim, T., J. Ryou, and Y. Wang, (2000) *Regional Arrangements to Borrow: A Scheme*

for Preventing Future Asian Liquidity Crises, Korea Institute for International Economic Policy, Soeul.

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

Lipschitz, L. and V. Sundrarajan (1980) "The optimal basket in a world of generalized floating," *IMF Staff Papers*, vol. 27 no.1, 80-100.

McKinnon, R. I. (1963) "Optimum currency area," *American Economic Review*, vol. 53, 717-725.

McKinnon, R. I. (2000) "After the crisis, the East Asian dollar standard resurrected: An interpretation of high-frequency exchange rate pegging," August.

Mundell, R. A. (1961) "A theory of optimum currency areas," *American Economic Review*, vol. 51, 657-665.

Ogawa, E. (2002) "Should East Asian countries return to a dollar peg again?" :in P. Drysdale and K. Ishigaki eds. *East Asian Trade and Financial Integration: New Issues*, Asia Pacific Press, 159-184.

Ogawa, E. and T. Ito (2000), "On the desirability of a regional basket currency arrangement," NBER, *Working Paper*, no. 8002.

Ogawa, E. and K. Kawasaki (2001) "Toward an Asian currency union," a paper prepared for the 2001 KIEP/NEAEF Conference on Strengthening Economic Cooperation in Northeast Asia held in Honolulu on 16-17 August 2001.

Ogawa, E. and K. Kawasaki (2008) "Adopting a common currency basket arrangement into the ASEAN plus three," in T. Ito and A. K. Rose eds., *International Financial Issues in the Pacific Rim: Global Imbalances, Financial Liberalization, & Exchange Rate Policy*, University of Chicago Press, 219-234.

Ogawa, E. and Y. N. Sasaki (1998) "Inertia in the key currency," *Japan and the World Economy*, vol. 10, no. 4, 421-439.

Ogawa, E. and J. Shimizu (2005) "AMU deviation indicator for coordinated exchange rate policies in East Asia," *RIETI Discussion Paper*, no.05-E-017.

Ogawa, E. and J. Shimizu (2006) "The core-AMU denominated Asian bonds for local investors in East Asia," APEA Conference, July 2006.

Ogawa, E. and J. Shimizu (2007) "Progress toward a Common Currency Basket System in East Asia," *RIETI Discussion Paper Series*, 06-E-038.

Ogawa, E. and L. Sun (2001) "How were capital inflows stimulated under the dollar peg system?" in T. Ito and A. O. Krueger eds., *Regional and Global Capital Flows: Macroeconomic Causes and Consequences*, University of Chicago Press, Chicago, 151-190.

Ohno, K. (1999) "Exchange rate management in developing Asia: Reassessment of the pre-crisis soft dollar zone," ADB Institute, *Working Paper Series*, No. 1, January 1999.

Reinhart, C. (2000) "The mirage of floating exchange rates," *American Economic Review*, vol.90, no.2, 65-70.

Stock, J., and M. Watson (1988) "Testing for common trends", *Journal of the American Statistical Association*, vol. 83, 1097- 1107.

Turnovsky, S. J. (1982) "A determination of the optimal currency basket," *Journal of International Economics*, vol. 12, 333-354.

Zhang, Z., K. Sato and M. McAleer (2004) "Is a monetary union feasible for East Asia?" *Applied Economics*, vol. 36, no.10, 1031-1043.

Table 1: ASEAN10+4's Trade Volumes and Shares in 2000

(millions of US dollars)

	ASEAN+4		EU Countries		US		World Total
	Trade volume	Share (%)	Trade volume	Share (%)	Trade volume	Share (%)	Trade volume
Brunei	3,465	75.5	340	7.4	532	11.6	4,589
Cambodia	1,175	46.1	326	12.8	772	30.3	2,547
Hong Kong	247,001	59.4	50,531	12.2	61,583	14.8	415,577
China	211,148	44.5	71,903	15.2	74,538	15.7	474,383
Indonesia	50,269	52.6	13,166	13.8	11,882	12.4	95,633
Japan	293,580	34.2	128,323	15.0	216,523	25.2	857,938
South Korea	133,825	40.2	41,102	12.4	67,092	20.2	332,738
Lao PDR	795	73.5	147	13.6	14	1.3	1,081
Malaysia	95,790	53.1	22,822	12.7	33,830	18.8	180,358
Myanmar	3,248	64.7	451	9.0	462	9.2	5,019
Philippines	31,992	44.0	10,080	13.9	17,819	24.5	72,707
Singapore	141,228	51.8	35,427	13.0	44,161	16.2	272,679
Thailand	63,109	48.2	17,730	13.5	21,997	16.8	130,886
Vietnam	17,902	59.4	4,359	14.5	1,097	3.6	30,119
Average Share (%)	53.4		12.8		15.8		

Source: Direction of Trade, IMF.
Each trade volume is the sum of export and import volume in 2000.
ASEAN10+4 include ASEAN10 countries plus China, HongKong, Japan and Korea.

Table 2: ASEAN10+4's Trade Volumes and Shares in 2007

(millions of US dollars)

	ASEAN+4		EU Countries		US		World Total
	Trade volume	Share (%)	Trade volume	Share (%)	Trade volume	Share (%)	Trade volume
Brunei	7,449	77.0	417	4.3	537	5.5	9,671
Cambodia	4,980	52.6	1,051	11.1	2,516	26.6	9,462
Hong Kong	467,371	68.6	66,503	9.8	55,437	8.1	681,565
China	795,923	36.6	356,283	16.4	309,052	14.2	2,175,630
Indonesia	149,622	61.3	24,021	9.8	18,484	7.6	244,128
Japan	532,836	39.9	170,786	12.8	217,839	16.3	1,336,124
South Korea	336,289	46.2	86,806	11.9	83,009	11.4	727,545
Lao PDR	2,581	78.9	209	6.4	34	1.0	3,270
Malaysia	177,159	54.8	40,135	12.4	43,459	13.4	323,189
Myanmar	7,693	77.5	568	5.7	9	0.1	9,930
Philippines	85,262	62.0	12,778	9.3	17,405	12.7	137,419
Singapore	316,256	56.2	64,783	11.5	59,511	10.6	562,498
Thailand	154,278	52.5	33,216	11.3	28,904	9.8	293,805
Vietnam	58,326	53.9	15,134	14.0	12,479	11.5	108,132
Average Share (%)	58.4		10.5		10.6		

Source: Direction of Trade, IMF.

Each trade volume is the sum of export and import volume in 2007.

ASEAN10+4 include ASEAN10 countries plus China, HongKong, Japan and Korea.

Table 3: Japan's FTA (EPA) Achievements with East Asian Countries

Japan-Singapore EPA	in force since Nov.2002
Japan-Philippines EPA	agreement in substance Nov.2004
Japan-Malaysia EPA	agreement in substance May, signed Dec. 2005
Japan-Thailand EPA	agreement in substance Sept. 2005
Japan-Korea EPA	negotiations started in Dec.2003
Japan-Indonesia EPA	agreed to start negotiations in June 2005, the first round was held in July 2005
Vietnam, Brunei	Preliminary talks started in early 2006

Source: Ministry of Finance, Japan

Table 4: DOIS estimation (1987:1 – 1997:6)

Dependent variables	Explanetories							
	Japan (Yen)	Indonesia (Rupiah)	Malaysia (Ringgit)	The Philippines (Peso)	Singapore ($SG)	Thailand (Baht)	Korea (Won)	China (Yuan)
EU/US (rank=1)	0.0162 (0.32122)	-0.9948 (2.02308)	0.7092 (0.62715)	-0.3870 (0.42195)	0.0467 (1.45216)	1.1397 (3.63366)		
EU/US (rank=2)	-	-0.9583 (1.15805)	0.6652 (0.50424)	-0.3676 (0.35774)	0.0227 (0.80176)	1.2014 (2.23868)		
JP/US (rank=2)	-	5.0534 **** (0.98000)	0.1892 (0.42671)	-0.3717 (0.30274)	3.3679 **** (0.67849)	-7.8083 **** (1.89449)		
EU/US (rank=1)	-0.3104 (0.20239)	-1.2086 (1.14389)	2.2608 *** (0.78621)	-0.8616 (0.35177)	0.0862 (0.78188)	1.2311 (1.98842)	1.0006 ** (0.44839)	
EU/US (rank=2)		-2.2605 ** (1.13705)	1.7601 ** (0.86317)	-0.6484 * (0.39031)	-0.7436 (0.70763)	3.0897 (2.00540)	0.7342 (0.44838)	
JP/US (rank=2)		3.2282 **** (1.19814)	1.6373 ** (0.90955)	-0.7135 ** (0.41129)	2.4474 ** (0.74565)	-5.4477 ** (2.11316)	0.9098 * (0.47248)	
EU/US (rank=1)	-0.0825 (0.30153)	-0.6479 (1.84107)	0.4326 (0.62267)	-0.3605 (0.37673)	1.0343 (1.59292)	0.6338 (3.35042)		0.1931 (0.22566)
EU/US (rank=2)		-1.0497 (1.17591)	0.3748 (0.55881)	-0.3139 (0.34406)	0.5836 (0.92062)	1.4740 (2.33383)		0.1710 (0.19899)
JP/US (rank=2)		4.4661 **** (0.97102)	-0.1835 (0.46144)	-0.3040 (0.28411)	4.0813 **** (0.76021)	-6.4481 **** (1.92718)		0.3130 * (0.16432)
EU/US (rank=1)	-0.3919 ** (0.19390)	-1.2604 (1.08749)	1.7446 * (0.91614)	-0.7352 (0.37657)	0.8780 (0.91154)	1.4663 (1.92056)	0.8249 * (0.48731)	0.1989 (0.13505)
EU/US (rank=2)		-2.2878 * (1.22817)	1.4196 (1.06306)	-0.5665 (0.43579)	-0.3763 (0.90096)	3.2852 (2.23441)	0.6266 (0.50100)	0.1074 (0.16949)
JP/US (rank=2)		2.6400 ** (1.14911)	1.2918 (0.99463)	-0.6293 (0.40774)	2.7869 *** (0.84296)	-4.0726 * (2.09059)	0.8312 * (0.46876)	0.2112 (0.15858)

†Significance level: *90%, **95%, ***97.5%, ****99%,

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Table 5: DOLS estimation (1998:1 – 2005:11)

Dependent variables	Japan (Yen)	Indonesia (Rupiah)	Malaysia (Ringgit)	The Philippines (Peso)	Explanetories Singapore ($SG)	Thailand (Baht)	Korea (Won)	China (Yuan)
EU/US (rank=1)	-0.7691 **** (0.14485)	0.6302 **** (0.08529)	-4.7695 **** (0.75476)	-0.4464 ** (0.18897)	2.7001 **** (0.43576)	0.6401 ** (0.29745)		
EU/US (rank=2)		0.5395 **** (0.18520)	-5.5718 **** (1.59216)	-0.3996 (0.41760)	2.0716 ** (0.93066)	0.4252 (0.63908)		
JP/US (rank=2)		0.1467 (0.21186)	1.4802 (1.82136)	-0.1484 (0.47772)	0.9202 (1.06464)	0.3034 (0.73107)		
EU/US (rank=1)	-0.8305 **** (0.09914)	0.5539 **** (0.06438)	-3.1482 **** (0.80190)	-0.6802 **** (0.15433)	3.0316 **** (0.30341)	0.4374 ** (0.20593)	0.3436 **** (0.11760)	
EU/US (rank=2)		0.5784 **** (0.21913)	-6.0095 *** (2.41719)	-0.3315 (0.50826)	2.1075 ** (0.97978)	0.4323 (0.67306)	-0.0637 (0.33892)	
JP/US (rank=2)		0.0080 (0.24933)	3.7160 (2.75032)	-0.4835 (0.57831)	1.1360 (1.11482)	0.1182 (0.76582)	0.4190 (0.38563)	
EU/US (rank=1)	-0.7994 **** (0.11328)	0.3811 **** (0.12513)	-3.6697 **** (0.77322)	-0.3838 *** (0.15093)	3.5278 **** (0.48399)	0.9368 **** (0.27155)		-2.35701 *** (0.99384)
EU/US (rank=2)		0.39405 (0.34461)	-4.9078 *** (1.91169)	-0.3771 (0.42660)	2.4352 ** (1.23349)	0.6283 (0.73022)		-1.2763 (2.58917)
JP/US (rank=2)		-0.0762 (0.42815)	2.1985 (2.37510)	-0.0406 (0.53001)	1.5688 (1.53249)	0.5425 (0.90723)	(3.21681)	-2.0129
EU/US (rank=1)	-0.8299 **** (0.11102)	0.4574 **** (0.12950)	-3.0462 **** (0.95485)	-0.5830 **** (0.20947)	3.3451 **** (0.49622)	0.6392 * (0.34440)	0.2442 (0.19039)	-1.1472 (1.34229)
EU/US (rank=2)		0.3025 (0.35394)	-5.8279 (2.35729)	-0.0949 (0.56030)	2.9225 (1.30130)	1.0064 (0.84758)	-0.2994 (0.42163)	-3.1035 (3.31939)
JP/US (rank=2)		0.0558 (0.44345)	3.8811 ** (2.95346)	-0.5069 (0.70200)	0.9068 ** (1.63040)	-0.0168 (1.06194)	0.4830 (0.52827)	0.6394 (4.15888)

†Significance level: *90%, **95%, ***97.5%, ****99%,

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Table 6. The core-AMU qualification

| Country | Sovereign Credit Rating (S&P) | FX Spot Market | | | FX Forward Swap Market | | | core-AMU qualification |
		Regulatory on Current Account	Regulatory on Capital Account	Liquidity	Regulatory	Liquidity within 1year	1Month Swap Bid-Ask Spread in May 2006 (%)	
Japan	AA-/Positive	O	O	Good	O	Good	0.01	Yes
HongKong	AA/Stable	O	O	Good	O	Good	0.02	Yes
Korea	A+/Stable	O	△	Good	△	Good	0.11	Yes
Singapore	AAA/Stable	O	O	Good	△	Good	0.03	Yes
Thailand	A/Stable	O	△	Good	△	Good	0.1	Yes
Malaysia	A+/Stable	△	△	Good	△	Good	0.19	No
Philippines	BB+/Stable	△	△	Good	△	average	0.19	No
Indonesia	BB+/Stable	O	O	Good	△	average	0.79	No
China	A/Stable	△	×	Good	△	Poor	-	No

Author's calculation
1. The data of Sovereign Credit Rating (S&P) are from the website of Asiabondsonlime. Each credid rating and outlook is for each Long-term Local Currency sovereign bond.
2. Each contry's regulatory information is from its central bank and monetary authority website. O means no restrictions, △ means some restrictions, and × means transactions are restricted for non residents.
3. Each market liquidity information is from Asian Currency Handbook 2005 (Deutsche Bank).
4. Each 1month swap bid-ask swap spread in May 2006 is calculated by the same procedure of Ogawa and Shimizu (2004). All spot rates and forward rates are collected from Bloomberg currency composit pages and Prebon Yamane Asia Region pages on sample days.

Ogawa and Shimizu (2006)

2

Table 7. Core-AMU Basket Weights of East Asian Currencies

Country	Share of Trade volume[1] %	Share of GDP measured at PPP[2] %	Share of Int'l Bonds and Notes by residence of issuer[3] %	Arithmetic average shares %, (a)	Benchmark exchange rate[4] (b)	AMU weights (a)/(b)
HongKong	22.79	3.81	15.84	14.15	0.1328	1.0650
Japan	61.76	67.10	45.14	58.00	0.0091	63.7683
South Korea	7.90	17.70	24.07	16.55	0.0009	191.9798
Singapore	0.58	2.14	11.55	4.76	0.5912	0.0805
Thailand	6.97	9.25	3.39	6.54	0.0246	2.6548

Author's calculation

1. The data of trade volume are calculated as the average of total export and import volumes in 2001, 2002 and 2003 taken from DOTS (IMF).

2. The data of GDP measured at PPP are in 2005 taken from the World Development Report, April 2006, World Bank.
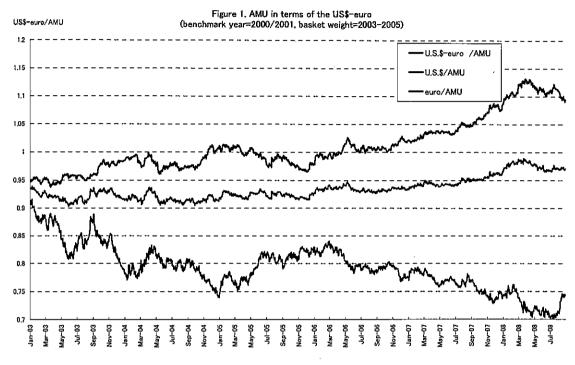
3. The data of International Bonds and Notes by Residence of Issuer are as of December, 2005 from BIS Annual Report Table 14b.

4. The Benchmark exchange rate ($-euro/Currency) is the average of the daily exchange rate in terms of US$-euro in 2000 and 2001.
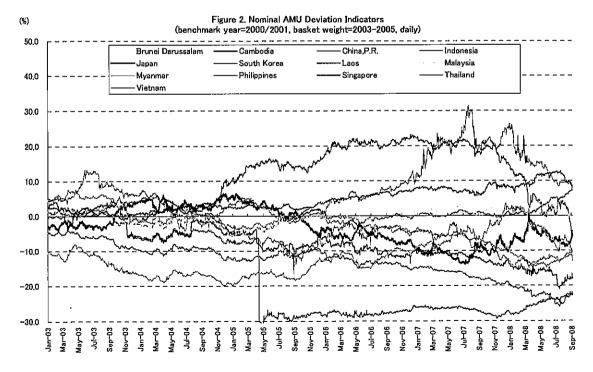
Ogawa and Shimizu (2006)

3

Appendix: AMU and AMU Deviation Indicator (Ogawa and Shimizu, 2005)

<AMU in terms of the US$-euro>

Figure 1. AMU in terms of the US$-euro
(benchmark year=2000/2001, basket weight=2003-2005)

US$-euro/AMU

<Nominal AMU Deviation Indicators>

Figure 2. Nominal AMU Deviation Indicators
(benchmark year=2000/2001, basket weight=2003-2005, daily)

Details about AMU are from RIETI. (http://www.rieti.go.jp/users/amu/en/index.html)