Steinherr, Alfred; Girardin, Eric

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Regional Monetary Units for East Asia: Lessons from Europe

Eric Girardin and Alfred Steinherr

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Eric Girardin is a member of ADBI's Advisory Council and a professor at GREQAM-Université de la Méditerranée (Aix-Marseille 2), France. Alfred Steinherr is a professor at the Free University of Bolzano, Italy; a research professor at DIW Berlin, Germany; and Honorary Chief Economist of the European Investment Bank, Luxembourg.

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Asian Development Bank Institute
Kasumigaseki Building 8F
3-2-5 Kasumigaseki, Chiyoda-ku
Tokyo 100-6008, Japan

Tel: +81-3-3593-5500
Fax: +81-3-3593-5571
URL: www.adbi.org
E-mail: info@adbi.org

Abstract

In this paper we report the European experience with a basket currency, the ECU. The ECU was initially introduced as a reference unit and later became the anchor of the European Monetary System. Public policy was complemented by private sector initiatives and use of the ECU for denomination of financial instruments. In practice, it turned out that a basket currency entails considerable unexpected technical complexities. The technical particularities of a basket currency are discussed before we turn to the criteria for determining the shares of participating currencies. We show that there are no iron-clad economic principles and therefore there is some room for political considerations. In Europe three criteria were used for determining the weights: GDP shares, international trade shares, and financial market indicators. In addition, weights will change with exchange rate movements. Appreciating currencies will experience increasing weights and depreciating currencies decreasing weights. This may require a correction mechanism for political acceptability. In Europe, weights were rescaled by political authorities every five years. From an economic viewpoint, weights depend critically on the purpose of the basket currency: is it a reference indicator, is it a currency for international transactions, or is it a parallel currency? Thus, before weights are to be discussed a clear vision of the role of the basket currency would be desirable. The vastly different growth performance among Asian economies also suggests a preference to forward rather than backward-looking measures. Turning then to the different functions of a basket currency, we examine the use of basket currencies as a divergence indicator, or as a financial instrument in regional financial markets before elaborating a road map for the development of a basket currency in Asia.

JEL Classification: F33, F36

Contents

I. INTRODUCTION[1]

The possible launch of an Asian currency unit (ACU), suggested at the beginning of the new millennium[2] as a means either to monitor divergence movements of the Association of South East Asian Nations (ASEAN) plus China, Korea and Japan's (ASEAN+3) individual currencies against their common regional movement or to serve as a currency of denomination of regional bonds, is now actively being discussed in different forums. There are, however, several technical aspects that need to be analyzed to identify the proper criteria for creating the ACU. Given the possible use of the ACU as a unit of account, a medium of exchange, and a store of value, a number of choices need to be made with regard to the selection of currencies to be part of the basket, the nature of the basket, the choice of weights and the criteria for their periodical revision, and others.

The European experience in establishing a European unit of account (EUA) during the "monetary snake" of the early 1970s, creating the European Monetary System (EMS) and the European Currency Unit (ECU) in 1979, and forming the European Monetary Union (EMU) with the birth of the euro as a new regional currency in 1999, provide relevant lessons for the creation of the ACU (Committee for the Study of Monetary Union 1989; European Economy 1990).[3] Indeed, during those three decades, the European experience was particularly rich both in using the ECU for currency market monitoring as well as for serving as the denomination for the issuance of bonds.

In Section II of this paper, the particular features of basket currencies are discussed. We then examine in Section III, arguments for a weighting structure. Section IV turns to the study of the use of basket currencies as divergence indicators for a group of countries that share a sense of commonality. In Section V, we investigate the scope of basket currencies for financial market integration. Finally, Section VI designs a road map for development of a market-based basket currency in Asia. In Appendix 1, we examine to what extent ASEAN+3 currencies have moved together since the Asian financial crisis and Appendix 2 discusses various sources of risk in basket-denominated bond holdings.

II. CONSTRUCTING AN ASIAN CURRENCY UNIT

In this section, we first set out the various choices in defining the ACU as a basket currency for East Asia. The appropriate decision will depend on the ultimate purpose of the ACU: will it be, at least for the initial phase, mainly an instrument for exchange market monitoring in the region without any monetary function? Or will it also become a currency for the denomination of debt instruments in the financial market? Finally, will it be admitted for domestic security issues? These choices would fall under the domain of the "store of value" function of money. At some time, possibly from the beginning, a regional currency could, if transactions costs were low enough, be used for invoicing and payments of international trade, rather than the United States (US) dollar. For use in domestic transactions, strong political will and decisions would be required. Both the international and domestic uses of the ACU would correspond to the "means of payments" function of money. As in many Asian countries, the US dollar is used for invoicing and payment; such a decision would be far-reaching in gradually developing the ACU and partly replacing other international currencies

[1]Paper prepared for the Asian Development Bank for the ASEAN+3, 2006–2007 research group on "Toward greater financial stability in the Asia region: Exploring steps to create Regional Monetary Units." We thank Masahiro Kawai and Giovanni Capanelli for the discussion and comments resulting from the conference, but we, the authors, remain solely responsible for the views expressed here.

[2] Kawai and Takagi (2005); Kuroda and Kawai (2002).

[3] To start rather than to crown regional integration with financial market cooperation was argued in Boiscuvier and Steinherr (2004).

for transactions in the region. International organizations and corporations, perhaps even domestic firms, may be allowed to use the ACU as a "unit of account" for presenting their balance sheets. This would be the last step in accepting the ACU as a "parallel currency." The latter decision is surely the most difficult one and may only be taken after a long period of experimentation with the ACU and its growing use by market participants. Clearly, the purpose for creating the ACU in the years to come will influence the choice among various technical options.

In Europe, the EMS that started operations in 1979 required a reference or base currency. For that purpose, Europeans could have taken a European national currency such as the deutschmark, or even the US dollar or gold. For a variety of reasons all these options had unacceptable features. Therefore they opted for a basket currency, the ECU. As had been the case with the special drawing rights, the initial monetary role of the ECU was very limited. It was the reference currency or unit of account of the monetary system. It also served as a unit of account among central banks and European institutions. But it was not conceived of as a means of payment or as a unit for financial assets.

Once the ECU was created with the stamp of official approval, it became a standardized and certified unit, with well-defined rules for changing the composition of the basket. Hence, this standardization gave the ECU a superior status to all other baskets. In principle, any investor could design a portfolio of securities in various currencies corresponding to his preferences. The ECU basket did not correspond to such optimal individual preferences. But it was unique through standardization. This brought benefits in terms of recognition and tradability. The financial industry leaped on this standardized basket for the issuance of securities with an interesting feature of risk diversification.

While in the short run it is easy for investors to make choices among different risk-return combinations, it is not so easy for long-term investments. For example, will the yen appreciate or depreciate with respect to the dollar over the next ten years? Nobody knows. Therefore, with a basket currency one is conscious of having not picked the best performing currency but one is also aware of having not chosen the worst performing one either. In this sense there is an attraction in basket currencies for long-term financial investments.

In light of the European experience and of the reticence among decision makers in Asia, we assume in this paper that if a basket currency was promoted in Asia, its official function would, at least for some time, be limited to one of a regional divergence indicator for national currencies. However, we are convinced that such a step would create incentives for the financial industry to issue securities in the regional basket currency.

The first decision that should be considered is whether to opt for a basket with fixed currency units or with fixed weights. We first consider a basket with fixed currency units, as was the case for the ECU. We then examine the possibility of a hard ACU with fixed weights before considering other open issues.

A. The Fixed Currency Unit – ACU

The value of the ACU in any currency "i" can be computed by applying to all component currencies the appropriate bilateral exchange rate with respect to currency "i." It is to be noted that the weight of each currency in the basket is therefore a function of the exchange rate. A currency that depreciates with respect to all other currencies in the basket sees its weight decline and the weights of all other currencies increase. This may be considered an attractive feature, as the basket "hardens": weaker currencies lose in importance to the benefit of harder currencies. If over time the same currencies always appreciate then the basket asymptotically converges to a basket of hard currencies. Politically, this may, however, not be acceptable.

1. Resetting the Weights

For that reason, the ECU underwent revisions of the weights, at 5-year intervals or whenever weights changed by more than a pre-defined barrier of 25%. When new currencies were included in the basket, the weights needed to be reviewed. In this sense, there is also a choice of an open versus closed basket to be taken. In an open basket, currencies initially not in the basket may join, or currencies may leave the basket.

If revisions take place, then they are to be carried out in such a way that the value of the ACU is not affected. This is easily done as there are enough degrees of freedom available. Consider the following example:

Example 1

To simplify, assume that the ACU contains only two currencies, A and B. The exchange rate is 1 A for 2 Bs. Initially, the ACU contains 3 As and 4 Bs. The value of the ACU is therefore 5 As or equivalently 10 Bs. The initial weight of currency A is then 0.6 and 0.4 for currency B. Suppose it was desired to have equal weights. The constraints are the exchange rate, weights of 0.5, and the value of the ACU. The solution is 2.5 units of currency A and 5 units of currency B. The value of the ACU in terms of currency A is unchanged at 5 As and in currency B at 10 Bs.

Example 1 illustrates the fact that the composition of the basket and the value of the ACU in terms of any existing currency are independent. This means that once the decision about the weights of component currencies at initial exchange rates is made, then it can be decided what the initial value of the ACU should be in terms of the US dollar, yen, or any other currency. This is illustrated in Example 2:

Example 2

Taking the assumptions of example 1 and an exchange rate of 1 US dollar = 2 As = 4 Bs, assume that it was desired to set the initial value of the ACU equal to 1 US dollar. How can this be done? If we define the ACU as a basket containing 1.2 As and 1.6 Bs then 1.2 As are worth 0.6 dollar, 1.6 Bs are worth 0.4 dollar and the ACU is worth 1 US dollar. The weight of currency A is 0.6 US dollar/1 US dollar or 0.6 and the weight of currency B is 0.4, as required.

Any resetting of the weights is nothing more than a redefinition without any financial implications. However, there is a problem with financial instruments in ACU. In principle (see below for additional concerns), the interest rate on an ACU instrument is the weighted average of interest rates in the component currencies. If interest rates differ, then the reweighing of the basket changes the weighted interest rate. When the market expects a reweighing of unknown proportions this creates uncertainty and leads to the creation of a risk premium.

Therefore, it might be preferable to aim in the long run at unchanged currency units and limit ex ante the time frame during which changes can be carried out. Such an initial period is necessary to gain experience, as the initial weights cannot be decided on the basis of hard facts alone.

With given currency units of a basket, the weight of each currency is a function of the exchange rate. The weight of a currency decreases after devaluation and increases after revaluation. Example 3 illustrates:

Example 3

Consider the basket of example 2 with 1.2 units of currency A and 1.6 units of currency B. As the exchange rate is 1 A for 2 Bs, the weights are 0.6 and 0.4, respectively. The initial value of the ACU in terms of currency A is 1.2 + 1.6(1/2) = 2. If currency B devalues with respect to currency A by 8% then the value of the ACU in currency A becomes 1.2 +

1.6/(2.16) = 1.94. Then the weights become 1.2/1.94 = 0.62 for currency A and 0.38 for currency B.

2. Interest Rates on ACU

As mentioned above, in principle, the interest rate on ACU instruments should be a weighted average of component interest rates. But there is a complication. Using interest rate parity, currencies with high interest rates are expected to depreciate. Hence, their weights are expected to decline. The longer the maturity, the more the changing weights will assume importance and for long-term instruments the interest rate of the ACU, in the absence of corrective re-weightings, should asymptotically converge to the lowest interest rate in the basket. Example 4 provides a numerical illustration.

Example 4

Consider the ACU as described in Example 2, with 1.2 currency units of A and 1.6 currency units for B and weights for currency A of 0.6 and for currency B of 0.4. Assume the existence of two financial instruments in both currencies A and B, overnight deposits and 1-year deposits. Interest rates are 2% for either deposit in currency A and 10% for either deposit in currency B. The yield curves are thus assumed flat. What will be the rates for ACU overnight and 1-year deposits? For overnight deposits the case is clear. The ACU rate is 0.6(2%) + 0.4(10%) = 5.2%.

For one-year deposits there is an additional difficulty. The existing interest rate differential suggests that on an expected basis, and taking interest-rate-parity into account, currency B is expected to depreciate over one year by 8%. Hence, the expected weights of both currencies change. From Example 3, we know that the weights will be 0.62 for currency A and 0.38 for currency B. Hence, the ACU 1-year interest rate is 0.62(2%) + 0.38(10%) = 5.04.

Example 4 shows that the longer the maturity, the more ACU interest rates will deviate from an average computed with initial weights and approach the lowest interest rate in the basket.

The fact that interest rates for long-maturity securities can substantially deviate from an average of current weights is not easily understood by market participants, particularly retail investors. Therefore appropriate communication is necessary and the ECU experience may be an advantage.

3. Enforcement of Equality Between the Value of the ACU and of the Basket

In the case of the ECU another issue had created considerable confusion. Market participants assumed that the value of the ECU had to be equal to the weighted average of the basket. However, this is only the case if some mechanism exists that ensures equality. The definition alone will not achieve that. During the early years of the ECU, the ECU Banking Association (EBA) set up a system making payments in ECU possible. Payments could be made either in ECU or with the basket. This ensured that the value differential was constrained by the transaction costs of delivering component currencies. Because it was difficult to get at low cost currencies with capital controls, the system was discontinued and payment had to be made in ECU. With this decision, the link between the ECU and the basket was taken away. In the EMS crisis of 1992, the differential reached a record of close to 10%, whereas transaction costs for basket payments to cover large positions were less than 0.5%. Therefore, it is necessary to decide what ties the value of the ACU to its basket. One way to do it is via the payments system as during the initial years of the EBA. Another is that one or several central banks, or a special purpose fund backed by all central banks in the ACU area, intervene to tie the value of the ACU to the basket.

4. Payments System for the ACU

The decision on equality of values for the ACU and the basket is tied to another one. How are payments in ACU to be processed? For particular reasons European central banks did not wish to assume that responsibility. Therefore private banks, in fact the largest and most reputable banks in Europe, joined forces to create the EBA with the objective to operate an ECU payments system.[4] With the creation of the euro, the EBA continued as a private system in competition with the official payments system Trans-European Automated Real-Time Gross Settlement Express Transfer System (TARGET). The EBA is able to compete with TARGET given that the EBA's transaction costs are considerably lower. The alternative is to create a payments system through the participating central banks.

B. A Fixed Weight ACU: the "Hard" Currency Option

Instead of a basket with fixed currency units and hence variable weights, it would be possible to opt for a fixed weight basket (and hence, variable units of currencies). This would require that every time a currency appreciates or depreciates, the number of units is adjusted to keep the weight constant. The implication would be that the ACU would never lose value with respect to any of its component currencies. This is one form of the "hard" ACU that was favored by the British Treasury as a strategy toward monetary union (H.M. Treasury 1989). It would in fact be the hardest currency of all because any component currency may go through phases of weakening. Example 5 illustrates this point:

Example 5

Pursuing example 2, assume that weights rather than currency units are fixed at 0.6 for currency A and at 0.4 for currency B. The initial currency units are 1.2 for currency A and 1.6 for currency B, given that the initial exchange rates are 1 US dollar = 2 As = 4 Bs. Now assume that currency B devalues by 50% with respect to all currencies. To keep the weight of currency B at 0.4 the number of units of currency B in the ACU basket must be increased by 50%, from 1.6 to 2.4 units. The dollar value of the ACU is then 1.2/2 + 2.4/6 = 1. Similarly, the ACU value in currency A is still 2. Due to the devaluation, the ACU value in terms of currency B is now 6. The ACU can only gain, but cannot lose value with respect to component currencies

The ACU interest rate would be below all component currencies. Girard, Pacheco, and Steinherr (1991) showed that a fixed-weight basket implicitly embodies an option that has a value. Therefore, the ACU interest rate would be below the lowest interest rate in the basket, the difference being associated with the value of the embodied option. It is also important to note that, in fact, weights do not matter for the value of the "hard" ACU.

C. Does a Basket Currency Require a Fixed Exchange Rate Regime?

The ECU was created as a reference currency for the EMS of fixed (but adjustable) exchange rates. This may raise the question whether the success of the ECU was not conditioned by the EMS. The ACU basket would contain currencies some of which have fixed exchange rates, other are floating with various degrees of management. It needs to be recognized that the EMS, although based on the ECU, did not in its functioning or performance depend on the ECU. Nor did the ECU in an essential way depend on the EMS. The ECU benefited from the official definition and recognition but not from the fixed exchange rate system.

Because a basket currency is a standardized diversified portfolio, it has all the advantages (never the worst performance) and disadvantages (never the best performance) of any diversified portfolio. The greater the volatility of the portfolio's components, the larger will be the gains. From this vantage point, flexible exchange rates are not a problem. Quite the

[4] The second author was the vice president of the EBA.

contrary: greater volatility provides larger gains for risk-averse holders of ACU assets or liabilities.

D. Change of Regime Over Time

At the beginning and at the end of the ECU experience there were regime changes. Before the ECU was created, European institutions needed a unit of account for keeping their books and for defining their contractual responsibilities. To that end, the EUA was created. It was not a currency but a simple unit of account. Initially (28 June 1974), one EUA was set equal to one special drawing right. At the time of the creation of the EMS in 1979, the ECU took over the defining characteristics of the EUA on a 1:1 basis. However, the name was changed to signal the creation of a currency. Also EUA is unpronounceable as a word. ECU had the advantage of being pronounceable and of recalling a currency that existed in French history.

As Europe refused to let the market decide through a parallel currency approach, the decision to create a single currency was political and happened on a day decided and announced well in advance. On that day, the ECU was converted 1:1 into the euro. In other words, the choice of value for the euro was completely free. It could have been anything: one euro equal to one deutschmark or one Lira or one US dollar. The obvious choice was to define it equal to one ECU. As the ECU had a value in terms of each component currency the value of the euro in terms of all other currencies was fixed automatically. To avoid having countries aim at entering the euro regime with undervalued exchange rates, the Maastricht Treaty required that no exchange rate adjustment was allowed two years prior to the regime change. Although the fluctuation bands around central parities were widened in August 1993 to 15% as a consequence of the EMS crisis, the terminal condition of euro conversion brought about convergence of the exchange rates to their central parities as predicted by theory.

As this experience indicates, the initial launching of a fixed-currency-units ACU, left many options open for later development: ACU membership can evolve, the ACU could be hardened (by stopping at some point basket revisions), or a hard ACU could be adopted. Such a hard ACU could be basket-based or made independent of the basket. Or the basket ACU could be turned into a non-basket Asian currency. Clearly, one big advantage of the basket construction can be seen in its flexibility.

III. CRITERIA FOR THE CHOICE OF WEIGHTS

A series of options are open when deciding upon the weights to be granted to ACU component currencies. The European experience offers some useful lessons. It is important to reflect on the role of weights before examining the actual variables to be used in setting such weights for the ACU.

A. The Historic Experience of the ECU

When the EMS started to operate on 13 March 1979, the definition of the ECU coincided with the definition of the European unit of account (EUA). The EUA was a “closed” basket of fixed quantities of the nine European Community (EC) currencies. Unlike the EUA, the ECU was defined as an “open” basket. The resolution of the EEC Council of 5 December 1978 stipulated that “the weights of the currencies in the ECU will be re-examined and, if necessary, revised within a period of six months of the entry into force of the system and thereafter every five years or, on request, if the weight of a currency has changed by 25%.” Moreover, Section 2 of the EEC Regulation of 18 December 1978 provides for the possibility that the Council fixes the terms under which the composition of the ECU could be modified: for example, in the event of inclusion of new countries within the system. In the five year period 1979–1984 the composition of the ECU changed as a consequence of the

devaluation or revaluation of component currencies (Table 1), even if none of the weights changed by more than 25%. Variations of the exchange rates were particularly wide only in the initial period of the EMS during which inflation rates diverged substantially.

European policymakers defined an "official" ECU by re-denominating a share of exchange reserves in ECU. These ECUs could only be used for transactions among central banks. Simultaneously, securities markets saw the advantage of a basket currency and various baskets were initially defined, differing in detail from the official definition. Although the "official" ECU and the "private" ECU have developed autonomously and with different characteristics, since 1981 the market began to use the same definition of "open" basket as formulated in setting up the EMS and the "open" basket formula became the only one adopted by commercial and financial agents. The adoption of this formula has been important because it has allowed the spontaneous establishment in the market of a uniform status of the ECU. It has increased the confidence of economic agents in the new currency by excluding the risk of coexistence of different types of ECUs. As a consequence, at maturity of an ECU-denominated financial instrument, the definition of the basket is different from the one on which it was initially based, if in the meantime an official re-definition has occurred.

Table 1: Initial Composition of the ECU

	Amounts in National Currency	**Economic Shares**	**Effective**		**Shares**
			Sept 1974	March 1979	March 1983
Germany	0.828	25.0	26.4	33.0	37.38
France	1.15	20.2	20.5	19.8	16.93
UK	0.0885	17.9	17.4	13.6	14.05
Netherlands	0.286	7.9	9.0	10.5	11.46
Italy	109.0	13.0	14.0	9.5	7.86
Belgium and Luxembourg	3.8	10.0	8.2	9.5	8.57
Denmark	0.217	3.0	3.0	3.0	2.70
Ireland	0.00759	1.5	1.1	1.1	1.06

Source: Gros and Thygesen (1998), Van Ypersele (1989).

The political motivation for ECU re-compositions was the fear that strong currencies could reach a dominant share of the ECU, which would be politically unacceptable to weak-currency countries. In particular, as Germany had the largest economy and the largest trade share and therefore the highest weight from the beginning and the strongest currency, the perceived risk was an increasingly dominating share for the deutschmark. Although the administrative procedures and general criteria for re-weighting were well-known, the market was faced with uncertainty as to the precise outcome of an essentially political negotiation. The uncertainty concerned ECU interest rates, which jumped on the day of re-composition, but not the exchange rate, as re-composition was undertaken subject to the constraint of unchanged exchange rate.

Every ECU revision needed the unanimous consent of the Council of Ministers. Beginning at the time of the creation of the ECU, three "economic" criteria were used for determining the weights of currencies in the ECU: the share of the individual member state in the EC's gross domestic product (GDP); the contribution of each member country to intra-EC trade; and, the quota of the individual member countries in the short-term support facility of the EMS (Table 1).

Table 2: First Revision of the Composition of the ECU

	Amounts in National Currency	Effective	Shares
	Sept 1984	Sept 1984	Jan 1987
Germany	0.719	32.07	34.93
France	1.310	19.06	18.97
UK	0.0878	14.98	11.87
Netherlands	0.256	10.13	11.04
Italy	140.0	9.98	9.44
Belgium and Luxembourg	3.85	8.57	9.07
Denmark	0.219	2.69	2.79
Ireland	0.00871	1.2	1.13
Greece	1.15	1.31	0.76

Source: Gros and Thygesen (1998); Van Ypersele (1989).

However, no explicit rule has been disclosed according to which changes in weights may be determined (Table 2). Nor is it known to what extent the above criteria were retained and how they were weighted. The British pound, which was not part of the EMS exchange rate mechanism, and the Italian lira, which had a 6% intervention margin, received much lower weights than what the three basic criteria would suggest (Table 1). The deutschmark, in contrast, had a larger weight.

Table 3: Second Revision of the Composition of the ECU, September 1989

Weight revision Sept 1989	Economic shares	Share Sept 1989	Share Dec 1996
Germany	23.8	30.3	32.0
France	18.4	19.0	20.3
UK	16.3	12.9	11.9
Netherlands	8.4	9.4	10.1
Italy	13.7	10.7	7.9
Belgium and Luxembourg	6.9	7.9	8.5
Denmark	2.5	2.5	2.7
Ireland	1.3	1.1	1.1
Greece	1.3	0.8	0.5
Spain	6.1	5.3	4.2
Portugal	1.1	0.8	0.7

Source: Gros and Thygesen (1998).

At the time of the second revision in September 1989, with a new addition of countries, economic criteria were not followed (Table 3), thus Spain was granted a share of 5.3% as opposed to its economic share of 6.1%. No lower limit seems to have been activated. Indeed, the weight was not revised upwards for Greece, while the initial weight was set under 1% for Portugal. Subsequently, the fall of the Greek share to 0.5% did not trigger any revision.

B. Do Weights Matter?

One consideration for assessing the importance of weights is surely political. On the most general level, it may be a question of national prestige. Furthermore, weak currencies may attach importance to an initially “exaggerated” weight in anticipation of future devaluations.

A counter argument against larger weights for “weak” currencies is that it can be expected that during the initial years of the ACU, as was the case for the ECU, there will be an excess of assets over liabilities that need to be covered. The higher the share of a currency in the ACU, the higher the demand will be for liabilities in that currency to cover ACU assets. This

technical argument is, however, likely to be marginal, except for countries with inconvertible currencies (for capital transactions).

Weak currencies tend to offer higher interest rates to compensate for the devaluation risk. On interest rate parity grounds there is no argument either for or against higher weights for weak or strong currencies, at least as long as the main use of the ACU is in securities markets. That is, the covered returns on all currencies in the same risk class are identical. Once the ACU becomes a transaction currency and is, therefore, held in cash (banking deposits), then obviously the "strong" currency argument becomes pertinent. As the scope for becoming a unit of account and a transaction currency depends on the strategic decision of allowing currency competition ("parallel" currency approach) or not, this argument may or may not be of importance.

The arguments discussed so far suggest that there is no strong ground for not admitting weak currencies into a basket. There is, however, a strong argument for having some strong currencies with a high international acceptance in the basket with a substantial weight. A basket of exclusively unstable, internationally non-traded currencies, will never gain acceptance. Strong currencies with international acceptance buy credibility. Moreover, their weight will increase over time and make the basket harder. If weaker currencies try to avoid losing weight, they have to harden and gain in international reputation. However, weaker currencies contribute to the yield so that both play a significant role.

Is it possible to develop arguments for an "optimal" composition? Only if one defines first "optimal for what purpose"? If the role of the ACU is viewed as one limited to foreign trade transactions, then it would make sense to weight component currencies according to intra-regional trade shares.

If the ACU is viewed as a parallel currency then a different weighting seems preferable. Consider the share of country j's imports (Mj) in intra-regional trade (M) as

$$Sj = Mj/M = (Mj/Yj)/(Yj/M)$$

or

$$Mj/Yj = Sj/(M/Yj),$$

where Yj is total expenditure of country j.

The optimum amount of domestic currency in the ACU should be positively correlated with (1 – Mj/Yj); i.e., with the share of domestic goods in domestic expenditures. For given intra-regional trade (M) and given expenditure (Yj), there is a positive correlation between Mj/Yj and Sj. Therefore, the larger a country's share in intra-regional trade, the smaller should be the share of its currency in the ACU. This is a counter-argument to correlating ACU weights with trade shares.

On the other hand, for given intra-regional trade and given trade shares, M and Y are inversely correlated. Hence, the larger gross national product, the larger should be country j's weight in the ACU.

For the ECU, the shares in the short-run EMS facility were taken as a proxy for the importance of a currency in international financial transactions. As such, it was very unsatisfactory. An alternative would be to take only convertibility into account. But this would not give a numerical weight. Better would be to take bond market transaction volumes that are a function of convertibility and financial development. Particularly, if the initial function of the ACU was seen in developing a regional ACU securities market this may be the key variable. Moreover, for investors in ACU securities the weighting is of little importance, as interest-rate-parity makes all convertible currencies equally attractive.

Given uncertainty with respect to the functions that the ACU will fulfill, it may seem reasonable to consider a weighted average of the three candidate criteria: GDP, trade, and financial assets.

To sum up, economic criteria for the weights of currencies in the ACU cannot be derived from any reasonable economic optimization approach. Key is to first define the functions of the ACU, as this will have an impact of the weighting decision. Also of importance is to let the market decide. This can be achieved by not resetting the weights following exchange rate changes. Once exchange rate stability in the region is achieved, implying interest rate convergence, the importance of weights will disappear to a large extent.

As big changes in the structure of weights would upset the market, give the currency a smack of political manipulation, and create unnecessary risks, the following approach appears advisable. If there is no long-term vision about the various steps and the ultimate goal of regional monetary integration, then it seems best to have a weighting that reflects the economic power of the participants but avoids very large shares (What is the point of a basket if one currency accounts for more than half?) and very tiny shares (Can there be a sense of ownership with a share of less than 1%?).

C. Economic and Financial Variables to be Used

In light of the above discussion and in line with the European experience with the ECU, three types of indicators are candidates for a basis for the computation of weights in the ACU: GDP, trade, and financial assets.

1. GDP, Trade, and Financial Assets

Using current nominal GDP in US dollars as the basis (Table 4, column 2), the weight of Japan is more than double that of People's Republic of China (PRC), which is itself three times that of Republic of Korea (hereafter Korea). The weight of Korea is itself three times larger than for Indonesia and four times larger than Thailand's. The Philippines' weight is half that of Thailand's, Malaysia's three-fourths, and Singapore's two-thirds. The sum of Cambodia, Lao People's Democratic Republic (Lao PDR), Myanmar, Brunei Darussalam, and Viet Nam's weights is lower than 1%. The use of the average share over the last three years would make little difference.

Using total trade (Table 4, column 3), the combined share of the two largest East Asian economies (the PRC and Japan) is close to 60%. Korea's and Singapore's shares are around half that of Japan; Malaysia and Thailand a quarter of Japan's and Indonesia, the Philippines and Viet Nam together an eighth of Japan's. Cambodia, Lao PDR, Myanmar, and Brunei's joint share is lower than 0.5%.

Basing weights on the international debt securities outstanding by residence of issuers (Table 4, column 4), the joint share of the PRC plus Korea would be two-thirds that of Japan, and this would leave a third of the weights to South-East Asian countries. The sum of Cambodia, Lao PDR, Myanmar, Brunei and Viet Nam's weights is de facto constrained to 0% because of the lack of issues of such securities by these countries.

Table 4: Economic Indicators* (shares in %)

	Nominal GDP	Total Trade	International Debt Securities
PRC	26.37	33.17	5.01
Japan	53.91	24.83	41.4
Korea	9.29	12.98	21.9
Indonesia	3.32	3.57	1.95
Malaysia	1.54	5.96	7.12
Philippines	1.16	2.09	8.60
Singapore	1.37	10.18	10.8
Thailand	2.04	5.13	3.11
		1.62	
Brunei Darussalam	0.11		
Cambodia	0.07	0.114	
Lao PDR	0.034	0.152	
Myanmar	0.14	0.034	
Viet Nam	0.61	0.117	

*All data for 2005. Column 2 computed on the basis of nominal GDP in US dollars.

Source: IMF World Economic Outlook database. Column 3: exports plus imports free on board.; ADB Key indicators. Col 4: International debt securities by residence of issuer; Bank for International Settlements, Table 14.B

2. Equal Shares for Different Indicators

In order to obtain a composite indicator for weights close in spirit to the approach that served as a basis for computing weights in the EMS, we gave equal weight to GDP, trade, and financial criteria. As shown in Table 5, the overall weight of Japan is then 40%, PRC's is close to 22%, and Korea's share is close to 15%. Singapore's share is half of Korea's and Malaysia is close behind. The share of Indonesia, Thailand, and the Philippines is between 2% and 3% for each, Viet Nam's less than 1%. Lao PDR, Myanmar, Cambodia, and Brunei, together amount to around 0.3%.[5]

Table 5: Composite weights (%) for 2005*

PRC	21.52
Japan	40.06
Korea	14.72
Indonesia	2.95
Malaysia	4.87
Philippines	3.95
Singapore	7.46
Thailand	3.43
Brunei	0.075
Cambodia	0.075
Lao PDR	0.023
Myanmar	0.087
Viet Nam	0.743

*Equal weights for the 2005 shares of nominal GDP, regional trade, and stocks of international debt by country of residence of issuer.

Source: Author's own computations.

[5] An alternative indicator with weights of 25% for GDP and finance and 50% for regional trade shares would leave the weights for the PRC or Korea roughly unchanged but would lower Japan's weight by 10% which would be redistributed to smaller countries. The advantage of such a weighting would be greater ownership by small countries, greater diversification, and higher financial returns. So the ACU would become more attractive for holders of ACU-denominated securities.

IV. DIVERGENCE INDICATORS FOR CURRENCY MARKET MONITORING

Divergence indicators serve various purposes. The most general use is for analytical purposes: an indicator or a series of indicators that reveal whether or not the exchange rate is in line or not and whether policy needs to react or not. Every central bank uses several such indicators, from changes in the nominal bilateral exchange rates, changes in the effective exchange rate, changes in real exchange rates, and inflation differentials or interest rate differentials. At the same time analysis will not neglect variations in foreign exchange reserves, imbalances of the current, and capital accounts and fiscal imbalances.

When conditions for the participation in the EMU were laid down in the Maastricht Treaty, the relevant convergence indicators (just the opposite of divergence indicators) were the following: first, stability of the nominal exchange rate parity for a certain minimum time (2 years); second, long-run interest rates and inflation rates had to be within 2 percentage points of the average of the lowest three in the European Union; and, third, the fiscal deficit had to be less than 3% of GDP and public debt less than 60% of GDP. The fiscal criteria were then taken over in the Growth and Stability Pact which provides rules for those countries which are EMU members.

A. Construction of a Divergence Indicator

Beyond the analytical use of indicators there is their use as market signaling devices. This is what we defined as the possible role of an ACU divergence indicator. The goal is to present with an easily understandable measure to market participants a summary statement of the exchange rate stance. For a bilateral fixed exchange rate, a useful measure is the average deviation from the parity inside the intervention band; or, the inverse: the average deviation from intervention bands over a chosen time period. For instance, if inside the intervention band the exchange rate moves repeatedly from the positive to the negative part of the band, this would be a sign of stability. This would be very different from a case where the exchange rate is close to one intervention limit, most of the time as an obvious sign of pressure.

The drawback of such a measure is that it is necessarily defined in bilateral terms for fixed exchange rates. If the exchange rates are not fixed, there is no intervention band. But even if exchange rates are fixed, deviations inside the bands may vary substantially among different currencies. Usually the focus is on the “reference” currency. If there is no clear reference currency either because there is no exchange rate system with an official anchor currency or because there are several key currencies in terms of their shares in foreign trade, the bilateral focus is too limited. A multiple currency divergence indicator would then be preferable. In the EMS, the “reference” currency was the ECU, a basket of all participating (and even non-participating) currencies.

If a basket currency is adopted as a monitoring device for currencies in a region that has decided to foster cooperation, then any currency could be strong (or weak) with respect to all others or only with respect to some. A divergence indicator would then measure whether an exchange rate of a particular member country is strengthening or weakening with respect to the whole group or is stable with regard to the group, weakening with respect to some and strengthening with respect to others.

When a basket currency is the reference currency, then the weight of any participating currency in the basket must be taken into account. To see this, consider the definition of a basket currency, namely a set of currencies each with a pre-defined number of units. The value of such a basket can then be expressed in any participating or non-participating currency. In equation (1) currency 1 in the basket is used, without any loss of generality. It could have been any other currency:

(1) $A(1) = a_1 + a_2E_{21} + a_3 E_{31} + \ldots a_nE_{n1}$

where A(1) is the value of the basket in currency 1, a_1 is the number of units of currency 1 in the basket, a_2 is the number of currency 2 in the basket and so on; E_{21} is the value of currency 2 in terms of currency 1, E_{31} is the value of currency 3 in terms of currency 1 and so on.

The change in the value of the basket, expressed in terms of currency 1, as a result of changes in bilateral exchange rates, is given by equation (2):

(2) $dA(1) = a_2 dE_{21} + a_3 dE_{31} + \ldots\ldots + a_n dE_{n1}$

In case of a fixed exchange rate system, the maximal bilateral exchange rate variation in percentage terms is, say m. If currency 1 was moving with respect to all others by m, then the maximum movement with respect to the basket would be obtained. Denoting percentage variations by "^" equation (2) can be rewritten in percentage changes:

(3) $\hat{A}(1) = w_2 \hat{E}_{21} + w_3 \hat{E}_{31} + \ldots\ldots + w_n \hat{E}_{n1} = (1 - w_1)m$

where w_i is the share of currency i in the basket, defined as $w_i = a_i.E_{i1}/A(1)$.

So, if for example m = 3% and w_1 = 0.6 shares, then the maximum variation of currency 1 with respect to the ACU (or maximum divergence gap) would be 1.2%. If by contrast w_1 = 0.1 shares then the maximum variation would be 2.7%. This reflects the fact that the higher the weight of a currency in the basket, the less can the basket value deviate from the par value of that currency. In the EMS, an alarm benchmark was defined. When a currency reached 75% of its maximum deviation as defined in equation (3) with respect to the ECU (the divergence threshold), the presumption was signaled that there was a risk of fundamental disequilibrium.

In the management of the EMS this divergence indicator played a useful role. When the divergence threshold was reached, this signaled that there should be a joint policy debate. The authorities of the currency concerned had to explain whether the stress was due to temporary factors or whether there was need for a policy adjustment. This adjustment was decided jointly in meetings in which the finance ministers and central bank governors of all EMS countries participated to ensure that the policy stance of the group of countries was coherent. Typically, adjustments to fiscal and monetary policies and the limit to exchange rate policies were at stake.

The divergence indicator was useful but, in actual operations, less than what was hoped for. There are basically three explanatory factors. First, group pressure was more effective on small rather than large countries. This will in all likelihood also be the case in other parts of the world, particularly with decisions as sensitive as the question of whether a devaluation is necessary and by how much? Second, as in the Bretton-Woods system, the pressure for adjustment was always on the weaker currencies and not on the strong currencies. This is an imminent structural problem of fixed exchange rate systems. Third, many countries did indeed observe the divergence indicator and intervened such as to avoid reaching the alarm benchmark. This last argument therefore suggests that the divergence indicator worked "behind the scenes." A more general limitation of the divergence indicator was that although in theory, the ECU was the reference currency of the EMS, in practice, the deutschmark occupied that role. Participating countries were therefore more focused on the bilateral deutschmark rate than on the ECU rate.

B. A Divergence Indicator for ACU

In the Asian context there is no fixed exchange rate arrangement, although several countries operate fixed exchange rates. Nor is there a body in charge of fostering a cooperative approach to decision making. Nevertheless, a divergence indicator can play a very useful role for market participants. The usefulness of such a role is not only due to the high and increasing interdependency among Asian economies. If all Asian economies did not trade at all with each other but only with the United States then it would still be important to monitor

how their nominal and real exchange rates deviated from each other in terms of the dollar. However, just looking at the dollar exchange rate can be very misleading if trade with the region becomes important. A better indicator would be based on two legs: first, the deviation of any Asian currency with respect to a basket of Asian currencies, the ACU; and, second, the variation of the ACU with respect to the dollar or a weighted average of dollar and euro. For example, an individual currency can have a stable dollar exchange rate and a rate depreciating with respect to the ACU because the latter is appreciating in dollar terms.

The usefulness of an ACU indicator would therefore reside in measuring the performance of a currency with respect to the rest of the currencies in the region. The more the region integrates the more important this measure will be. As there is no fixed exchange rate system sustaining the participating currencies, there should be a nominal and a real indicator. In countries that are catching up, the real exchange rate is far from constant even with flexible exchange rates. But independent of the question whether nominal exchange rates are fixed or flexible the value of the real exchange rate varies. Countries that search for more and more cooperative forms of decision making will wish to know how the real exchange rate with respect to the entire area, and not just on a bilateral basis, has moved.

For the nominal divergence indicator, equation 3 can be taken. For the real divergence indicator it suffices to replace in equation 3 the nominal bilateral exchange rates by the real exchange rates, namely for currency i:

(4) $R_{ij} = E_{ij}P_j/P_i$,

where E_{ij} is the nominal exchange rate of currency i with respect to currency j and P_j is the price level in country j and P_i the price level in country i.

Such indicators will be useful for market participants, even if they play no role for policymakers. If policymakers did pay attention to such indicators in their policy analysis, that would seriously promote the importance of the divergence indicators.

Technical preparation would clarify which price indicators to use and entrust the computation of the divergence indicators to an agency in the region (e.g., a central bank, a secretariat of central banks, the ASEAN secretariat, etc.).

Increasing use and importance of the divergence indicator will also promote the idea of an Asian basket currency and the desirability of increasing regional policy cooperation.

V. AN ACU FOR DENOMINATING FINANCIAL TRANSACTIONS

A. The Store of Value Function of an Asian Regional Unit

It is possible for the ACU to perform at least some of the functions of an international currency basket. It might be assumed that the ACU would be a low risk currency, well suited to risk-averse investors. By backtracking a synthetic ACU, it is possible to explore the extent to which the risk properties of such an ACU would have met these priors. We examine the risk properties of short-term investments in ACU as compared to investments in national instruments. The unavailability of data for a large number of East Asian countries over a long enough sample precludes us from examining the more complex issue linked to investments in long maturity instruments in ACU. Therefore, we study the latter issue in Appendix 2 in the light of the European experience with the ECU.

1. Short Maturities

The risk properties of short-term investments in ACU should be compared with the risk properties of short-term investments in each national currency. We consider such risk properties from the point of view of returns on ACU holdings in each national habitat. For the

2000:I–2006:I period, we examined twelve East Asian countries.[6] Quarterly data were used in order to match the maturity of the investments with the frequency of the data. We present the mean return, risk (as measured by the standard deviation), and the ratio between the two (the Sharpe ratio).

The formula in definition (5) was used for Table 6 to compute the return in a national habitat of an investment in an ACU short-term instrument:

(5) $R_{acuj}=[(E_t/E_{t-1})*((i_{acu,t-1})/4)+((E_t - E_{t-1})/E_{t-1})*100)]*4$

E_t = number of units of domestic currency per ACU

i_{acu}= interest rate on 3-month investment in ACU instrument at annual rate

In national habitats, mean returns were higher for investments in ACU instruments than in the instruments of Cambodia, Japan, Singapore, and Thailand (Table 6). However, in national habitats, volatility was always much higher for an investment in an ACU instrument. Therefore, Sharpe ratios are considerably smaller for investment in ACU instruments than for investments in national instruments.[7]

Table 6: Annualized Returns in National Habitat for Short Term Investment in ACU and Domestic Instruments,* 2000:1–2006:1

		ACU			Domestic	
	μ	**σ**	**μ/σ**	**μ**	**σ**	**μ/σ**
PRC	2.48	11.3	0.21	3.02	0.29	10.4
Japan	6.15	29.8	0.21	0.03	0.06	0.50
Korea	1.27	28.5	0.04	4.16	0.65	6.40
Indonesia	8.46	36.6	0.23	9.80	3.89	2.51
Malaysia	2.51	11.6	0.21	2.73	0.10	27.3
Philippines	7.18	19.4	0.37	8.16	1.81	4.50
Singapore	2.83	19.5	0.14	1.66	0.84	1.97
Thailand	4.04	22.9	0.17	1.90	0.73	2.60
Cambodia	4.35	12.0	0.36	3.17	1.92	1.65
Lao PDR	8.23	18.3	0.45	22.7	4.51	5.03
Myanmar	2.62	21.5	0.12	10.08	0.40	25.2
Viet Nam	5.06	11.8	0.43	5.77	0.36	16.0

*Three-month interbank interest rates except bill rate for Lao and Viet Nam, bank rate for the PRC and Myanmar, lending rate for Cambodia, and spot exchange rates.

Source of quarterly data: IMF Financial Statistics. We denote the mean by μ and the standard deviation of returns by σ.

2. Long Maturities: the ACU as a Special Currency

In principle the interest rate on ACU instruments should be a weighted average of component interest rates. But because of its basket nature, the ACU will be a rather complex and special currency. First, the interest rate elasticity of the ACU with respect to interest rates on component currencies will be a function of maturity. The longer the maturity of an ACU-denominated bond, the higher will be its elasticity with respect to changes in low yield currencies and vice versa. The reason is that market participants

[6] Interest rate information for Brunei Darussalam was unavailable for that time frame.
[7] The ACU retained here is the one defined in Table 5.

need to project exchange rate movements until maturity, on the basis of existing interest rate differentials among component currencies to remain consistent with interest rate parity constraints.

Second, the above result implies that the ACU yield curve will be flatter than the curve obtained by aggregation of individual component currency yield curves based on actual weights in the ACU. To illustrate this point, it is useful to consider a case where yield curves of all component currencies are flat, as we did in Example 4. The ACU yield curve would then be negatively sloped; this is because, at any point in time, current interest rate differentials suggest (on an interest rate parity basis) that, over time and up to maturity, low-yield currencies will appreciate against high-yield currencies. Hence, the weight (i.e., the product of the amounts of a currency in the ACU definition times the ACU exchange rate of this currency) of low-yield currencies will increase over time and the weight of high-yield currencies will decline (see Girardin and Steinherr 2006). The implication is that the weighted average of interest rates on component currencies is declining over time.

Third, variations of exchange rates between component currencies will affect ACU interest rates only very marginally. In fact, the sign of the exchange rate effect is not clear *a priori:* a devaluation of a component currency in terms of all others may result in a decrease or an increase in the ACU interest rate. Devaluation of a currency with interest rates above (below) ACU interest rates result in a reduction (increase) of ACU interest rates. Because devaluation lowers the weight of the devalued currency in the ACU basket, the variation in ACU interest rates depends on whether the devalued currency's interest rates are above or below ACU rates. This effect is obviously small because all other component currencies are, by definition, revalued, some of them with interest rates above ACU rates. Therefore, the reduction in ACU interest rates will be dampened.

The case of long-maturity investments is examined in detail in Appendix 2. We cannot do this for East Asia since small countries among ASEAN+3 which do not have an active bond market would have to be excluded. We analyzed a variety of risks that are specific to the ECU as a basket currency and those that are shared with any other foreign currency. We are able to identify two sources of risk that are analytically identical but differ from a policy perspective. One derives from the uncertainty associated with exchange rate changes on component currencies. The premium attached to this type of risk is factored in the spread between theoretical and market interest rates for ECU-denominated assets.

The second type of risk is due to the fact that interest rate parity must be used to compute a time path for future weights of basket components. Forward rates are considered (though by a shrinking set of economists) as best-linear-unbiased estimators of future exchange rates, but their performance is very poor. Hence, forecast errors will be made and the prices of ECU-denominated bonds factored in a risk premium. Clearly, both types of risk were due to the variable weights nature of an ECU basket, as opposed to a fixed-weight one.

3. Risk in the ACU Habitat

Table 7 lists "beta" coefficients for the sake of comparing the attractiveness of the ACU in the East Asian habitat with that of domestic currencies. We set the beta of the ACU returns in the East Asian habitat equal to unity (equivalent to the relevant "market" risk) and for all other currencies we ran the following regression:

(6) $Y_i = \alpha + \beta X_E$

where Y_i is the return on a comparable domestic money-market instrument (three month returns) converted into ACUs (same as computed in column 2 of Table 6), and X_E the return on ACU-denominated money-market instruments. If the estimated beta for currency i is equal to one, then, on average, it would be as risky as the ACU. A beta larger than

one suggests that the currency is riskier; a beta of under one, but positive, then the currency is less risky than the ACU.

Table 7: Estimated beta-coefficients* (1999:1–2006:1)

	β	t	R2	Garch
PRC	0.55	0.09	0.000	-
Japan	4.56	0.33	-	yes
Korea	0.36	0.02	0.000	-
Indonesia	44.7	2.04	-	yes
Malaysia	1.07	0.17	0.01	-
Philippines	4.92	0.92	-	yes
Singapore	1.70	1.21	0.001	-
Thailand	-3.04	0.24	0.002	-
Cambodia	5.20	0.81	0.03	-
Lao PDR[a]	-9.59	0.87	0.03	-
Myanmar	-4.61	0.50	0.007	-
Viet Nam	1.71	0.22	0.003	-

Notes: * signifies quarterly data. Three-month interbank interest rates except bill rate for Lao and Viet Nam, bank rate for the PRC and Myanmar, and deposit rate for Cambodia. Garch is used whenever evidence of conditional heteroscedasticity is detected in OLS estimation.

a) 2000:I–2006:I.

Source: Author's own estimations.

The results in Table 7 suggest that in the East Asian habitat, for most currencies, the beta is insignificant. One exception is Indonesia, whose currency with a beta significantly positive is riskier than the ACU. An important result is that no currency has a *significantly* negative beta. A *significantly* negative beta would imply that a currency would be very risky, but also, and at the same time, that it would be a useful hedge for the ACU. In other words, an important implication of such results is that none of the currencies examined is such that its non-participation would make the ACU more attractive than otherwise.

B. Launching and Nurturing the ACU

1. Cost-Benefit Analysis of ACU-Bond Issuance

The existing experience with the issuance of basket bonds is only recent. Multi-currency bonds issued before the First World War or dual currency bonds issued after the collapse of the Bretton-Woods system were not real precedents since they simply embedded currency options protecting the investor against the depreciation of any of the currencies (Dammers and McCauley 2005). Basket currencies such as special drawing rights or the initial ECU were virtual currencies since settlement had to be made in other "real" currencies, but subsequently this did not apply to the ECU any more since settlement could be made in that currency.

a. Benefits: Is Diversification Sufficient?

In principle even the benefit of diversification may not seem to be a *necessary* condition. In principle, an investor could by herself buy a portfolio of bonds denominated in all the

currencies in the basket. However, in practice, this may not be feasible because of the unavailability of the denominations for small amounts, and it may not even be available since bonds may simply not exist in the required currency or maturity, and international issuance is simply prohibited for residents of some countries.

Even if diversification benefits are present for the issuance of ACU-denominated instruments, would this be a *sufficient* condition for the success of such issuance? Some observers of the European experience with the ECU bond markets in the 1980s and 1990s argue that the success of issues on such a market had more to do with either *regulatory arbitrage or convergence trades*, than with diversification benefits. On the former, German regulation enforced the anchoring principle, implying that foreign issuance of German mark bonds had to be underwritten by a German bank. As a response to such regulations, non-German banks attempted to create an alternative to the US dollar which could mimic the mark. As a result, the underwriters of ECU bond issues were exclusively non-German over the 1980–1987 period. The convergence trade interpretation is based on the subsequent period when the stability of the European currencies within the European exchange rate mechanism (ERM) led investors to benefit from excess returns over German mark yields. Issuance collapsed when such stability vanished after the 1992 ERM crisis, and only took off again when a clear commitment to EMU was made in the second half of the 1990s.

In East Asia, regulatory arbitrage may work also but in a different way: there is currently no possibility for international or regional investors to access the issuance of bonds denominated in many East Asian currencies because of capital controls. However, this leads to a dilemma (Eichengreen and Luengnaruemitchai 2004) because it is wise to liberalize only after financial markets have become robust enough, i.e., sufficiently liquid and deep. The development of ACU bond markets could help sidestep this dilemma. By providing special treatment, within domestic foreign exchange regulations, to domestic issuance of bonds denominated in ACU, foreign investors would be given access to securities issued by domestic residents, and financial market development and deepening would be initiated, with immediate access to the international financial environment.

If the argument about the predominance of convergence trade is right, then exchange rate stability before the East Asian crisis was a missed opportunity. Indeed, as was clearly explained in the moral hazard theory of the crisis, investors were convinced that the dollar peg was going to last. However, such a discussion centered purely on the European experience may miss three other important dimensions specific to East Asia (Park and Park 2005). First on efficiency grounds, a regional ACU-denominated bond market may provide issuers, public or private, with a greater availability of funds at a lower cost, with deeper, more liquid markets on which a larger diversity of instruments is traded. Second, even though some observers may argue that there is no place for a regional market on top of existing national and global bond markets, there may be a case for a regional bond market based on “missing markets.” Indeed, issuing corporate bonds with a low investment grade (B to BBB) is not always available to Asian firms on global markets. One of the reasons for such a missing market is that these firms inherit from the rating of their sovereign, which may not be representative of their own financial performance. Regional rating agencies would not be victims of such an asymmetry of information. Securitization on a regional market would be a partial answer if complemented by credit guarantees helping to dispose of subordinated bonds. Third, the current pattern of financial flows between East Asia and the rest of the world still involves investing official reserves in short-term dollar denominated assets, and borrowing short-term from banks in US dollars. Regional bond markets would contribute to reducing the exclusive reliance on such short-term recycling.

Some regional initiatives have been started, such as the Asian Bond Market Initiative and the Asian Bond Fund. However, since the latter should invest in bonds denominated in US dollars by East Asian issuers, it is not clear that it will help to develop the East Asian bond market. It would be better for such a fund to invest in ACU-denominated bonds.

b. Costs: a Zero-Sum Game?

A major worry attached to the development of sovereign issues of ACU-denominated bonds is that if a given government were to choose the ACU-bond market instead of the domestic currency-bond market, the latter would shrink. Its turnover and liquidity would diminish and its long-term development would be impaired. Such a concern seems overplayed in the East Asian case. Indeed, first, this may actually leave more room for private issuers in the domestic market; second, the funding needs of many governments in East Asia are huge, for example for infrastructure development or pension funds. Even for intermediate-sized countries, such worries may not materialize. More fundamentally, such concerns ignore what was one of the main tenets of the "original sin" theory of the East Asian crisis, i.e., the inability of many countries in the region to issue bonds denominated in their own currencies. For such countries, the issuance of ACU-denominated bonds would be a golden opportunity, enabling them to avoid putting all their eggs in the same basket, i.e., to be able not to issue bonds denominated in one single international currency, but in a basket of regional currencies.

Another concern would relate to the difficulty of interpretation and associated risks inherent in a basket or virtual currency. Supposedly, it would be difficult to market basket bonds to issuers and investors given their complexity. Such an argument seems rather far-fetched at a time when the sophistication of financial markets has reached such high levels, and the understanding of financial products has become general knowledge.

2. The Regulation and Supervision of the ACU

a. How to Treat Banking Activities in ACU?

The experience of Singapore, with its offshore foreign currency business, enjoying different regulations, rules, and supervisory regime (Box 1), since the late 1960s provides some guidance on ways to treat loans and deposits in foreign currencies (of which the potential ACU would be an example). Strictly speaking, the differential treatment of foreign currency business in Singapore has not required the continuation of de jure capital controls, in as much as the latter were discontinued in the late 1970s. However, the framework shows that countries whose currency would be included in the ACU could allow a different treatment, in the activities of their banks, for deposits and loans in domestic currency and deposits or loans in ACU. This could prove important given the widely different roles and structures of national banking systems in the region. The differential treatment of domestic currency and ACU business would allow regulations for the domestic currency activity of banks to gradually evolve while business in ACU would be treated as offshore activities. Such differential treatment would amount to accounting distinctions for financial legal entities established within the same financial institutions and registered to operate according to separate and specific guidelines decided by national banking regulators.

Foreign banks could be offered incentives to participate in offshore ACU activities as well as deterrents against operating in the onshore domestic currency market, whenever national regulators wish so. These deterrents could include: a ceiling on domestic currency loans, the relative inaccessibility of local deposits, as well as high reserve costs. Incentives for offshore ACU activities would comprehend the lifting of any withholding tax on the interest income of non-residents, the waiving of statutory reserve requirements, as well as a large number of fiscal incentives with respect to foreign securities trading, fund management, and syndicated loans.

The dichotomization of activities of domestic banks would be a way for domestic banks to learn more quickly how to deal with a liquid and active environment. In particular, this would allow the involvement of such bank in the development of an active ACU inter-bank market while, in many small ASEAN countries, the inter-bank market is still at a very early stage. It is possible that such a scheme may result in the predominance of the ACU business over

the domestic currency one. The latter possibility, of course, would be welcome from the point of view of the development of the ACU.

Reference can also be made to the European experience with dual foreign exchange markets in Belgium, tax exemption on ECU transactions in Italy, and special treatment under capital controls in Ireland (Gros and Thygesen 1998).

Box 1: Offshore Banking Activities in Singapore: an Asian Dollar, not an ACU, Market

For unclear reasons, Singapore has been using for decades (since 1968 precisely) as a misnomer the term Asian Currency Unit (ACU) to designate the foreign currency activities of Singaporean banks as opposed to their domestic currency activities. This refers to accounting distinctions for financial legal entities established within the same financial institutions and registered to operate according to separate and specific guidelines decided upon by the Monetary Authority of Singapore. One of the typical outcomes of such ACU has been an Asian US dollar market. In other words these offshore activities are simply equivalent to the euro-dollar market in London, since, in practice, the offshore activities are dominated by the US dollar (Giap and Kang 1999).

Foreign banks have been offered incentives to participate in these offshore activities as well as deterrents to operate in the onshore Singapore dollar market. Among the latter are: a ceiling on Singapore dollar loans, the relative inaccessibility of local deposits, as well as high reserve costs. The former include, for the offshore activities, lifting of the withholding tax on the interest income on non-residents, waiving statutory reserve requirements, and a large number of fiscal incentives with respect to foreign securities trading, fund management, and syndicated loans.

The dichotomization of activities of banks has resulted in the predominance of the foreign currency business over the domestic currency one, with a proportion three-fourth, one-fourth, respectively. Offshore activities are essentially short-term since more than two-thirds of both assets and liabilities have a maturity not in excess of three months. Besides, the bulk of the activity on the liability side (four-fifths of deposits) is an inter-bank one, while loans to non-bank customers have had at times a more substantial share, with more than one-third.

There is always the danger that flows of funds between the onshore and offshore deposits be destabilizing. In such a two-tier financial system, the exchange rate must be relatively stable to discourage currency arbitrages. Moreover, in order to prevent round-tripping, the regulations, safeguards, and incentives designed for the two types of activities must remain consistent, with only infrequent revisions.

It is important to emphasize that the dual track financial system has coexisted with free capital mobility, as illustrated by the close parallel movements of the Singapore domestic money market interest rate and the inter-bank US dollar interest rate Singapore Inter Bank Offering Rates (SIBOR), with lower domestic rates, due to low inflation, but a narrowing spread. The dichotomization of the financial system has been a way to hamper while not forbidding capital mobility, since exchange controls were officially lifted in 1978.

b. The ACU as a Parallel Currency

For the ACU, a number of potential choices can be derived from the ECU experience (Box 2). One of those concerns is the possible treatment of the ACU as a parallel currency. In countries with weak and volatile currencies, economic agents tend to hold cash positions in foreign currencies (dollar) anyhow. In such countries, the ACU would be rapidly accepted and would possibly crowd out national currencies. All the more so if national authorities accept ACU balance sheets and tax payments. In hard currency countries, this process would be much slower and possibly only begin when the ACU is already a major currency in some countries. Over time, the market would decide; a process that European countries had not accepted. Second, it would be advisable not to repeat the European experience in creating an official and a private ACU (Girardin and Steinherr 2006).

As far as consumers are concerned, it is only in partly US dollarized economies that replacing dollar holdings with holdings of ACU could be considered a positive step. However,

as a general principle, the experience of most developing economies shows that currency substitution for consumers is a source of monetary instability. Therefore, any scheme intended to introduce such substitution, where it is absent, should be seen with great skepticism, and used only when there is full certainty that monetary instability will not be the first and foremost by-product.

Box 2: The ECU and the Different Functions of Money

Of the three functions of money—transactions medium, unit of account, and store of value—the ECU had its greatest success as a store of value. Before the EMS crisis of 1992 ECU securities ranked among the top three currencies in international securities markets. There were essentially two explanations for this success: first, ECU assets did not suffer from political restrictions. Second, the yield/risk trade-off was positive. The ECU offered a higher return than the hard currencies (Deutschmark) and kept appreciating with respect to the weaker currencies. It was a normed diversified portfolio. The norm (a standardized basket) was important for uniformity, reduced information costs, comparability, and fungibility between securities and accounts. In addition, it had the political backing from large European institutions. Above all, the European Commission and the European Investment Bank became large, regular issuers of ECU bonds. The governments of some countries with weaker currencies and high borrowing needs, such as Italy, Spain, and France, issued bonds in ECU.

The ECU had much less success as a medium of exchange and as a unit of account. The main problem was that Germany refused to accept the ECU as a "parallel" currency. Therefore, the ECU was treated in every country as a foreign currency. The implication was double. First, although international companies had preferred to keep accounts in ECU, as they were required by national authorities to present accounts in national currency and make tax payments in national currency they refused to keep accounts in two currencies for cost reasons. The only exceptions were the European institutions operating only on an ECU basis and some multinationals that kept their international operations in ECU. The unit of account function did not develop any further. Second, the medium of exchange function was hampered by the fact that, as long as national currencies are dominant, payment of an international operation required two exchange transactions rather than one. For example, a French importer of merchandise from Italy had to change French francs into ECU and the receiving Italian exporter had to change ECU into Italian lira. Hence, it was easier and cheaper to pay directly in francs or in lira. This problem does not exist when an international currency (e.g., the US dollar) is used, as is the case with inconvertible currencies. A political solution is also possible. If there is central bank support for the ACU, in order to foster its development as a medium of exchange, central banks could provide the ACU with a bid/ask spread below the combined bid/spreads of two exchange rate operations. As spreads are determined by the exchange risk (lower for a basket currency), cost of borrowing, and accessibility, central banks could offer that service without cost.

VI. ROAD MAP FOR THE MARKET BASED DEVELOPMENT OF THE STORE OF VALUE ACU

Once the ACU is well established as an indicator for regional exchange markets and as monetary cooperation progresses, there will be a market demand for ACU-denominated securities. This demand will be all the more pronounced if ASEAN countries pursue a long-term vision of monetary cooperation (Park and Park 2005).

ASEAN+3 countries have already identified bond market development as an important goal for regional cooperation. Instead of issuing foreign debt in US dollar, less exchange risk would be assumed by denominating debt in the regional currency. This is what the European experience suggests.

A. ACU Bond Market Development: Why and How?

At least during an initial phase of development of the ACU into a financial instrument, the ACU's major use will be for denomination of debt instruments. This is suggested by the

European experience with the ECU and by our assessment that the political willingness to award to the ACU a role as a unit of account and as a means of payment will require time and success in its store of value function.

Success of the ACU in bond markets depends on frequency of issuing activity, market liquidity, participation of regional and out-of-region borrowers, and participation of first-class borrowers. Without participation by regional governments it would certainly take longer to establish a well-functioning market. The ECU experience suggests that it is feasible to rely on private investors and borrowers. However, at the time of launching the ECU, Europe was already more integrated than ASEAN+3 is today, with greater institutional support for integration. Therefore, it would greatly help ACU market development if regional governments provided early support for the ACU. This should also be in their own interests, as we are showing now.

Many governments or public agencies in the region borrow in US dollars and thereby take a major exchange risk. During the last ten years, integration of the East Asian economies has progressed dramatically. Intra-industry trade has been the driving force; for example, the PRC's export surplus in bilateral trade with the United States and Europe is based on trade deficits with respect to countries from the region. Therefore, while many economies in the region can still suffer from asymmetric shocks, a greater source of concern is regional shocks. If demand in the United States or, to a lesser extent, Europe were to falter or if demand for IT equipment and electronic goods were to fall, then the whole region would be affected. This is also supported by the results of Girardin (2005), which showed that the correlation among ASEAN economies' growth cycles has increased and is close to where Europe was at the beginning of its monetary integration.

The financial consequence is that the risks on dollar assets or liabilities are much larger than they would be on ACU assets or liabilities. Therefore, it would be in the interest of regional governments when borrowing in foreign currency, to borrow in ACU rather than in US dollars.

The same is true for investment of exchange reserves, where Asian economies already exhibit a worrisome concentration on US dollar securities. Diversification into euro securities would be problematic as such a shift would cause an appreciation of the euro with respect to the US dollar, while the major imbalances are between Asia and the US. Moreover, the US authorities would not see such a diversification indifferently.

Investment of foreign exchange reserves in ACU securities would have several advantages. The US cannot possibly block investment in ACU securities as Asian governments would invest in their own currencies. Europeans could not object either as Europe would only be affected indirectly. The consequence would be a depreciation of the US dollar with respect to all currencies. In this sense substitution of the dollar through the ACU in Asian central banks' foreign exchange reserves would contribute positively to the reduction of global imbalances, avoid an excessive burden on individual regions of the world, and diminish the losses central banks are currently exposed to in case of a strong depreciation of the US dollar.

For Asian central banks to be able to diversify their foreign exchange holdings into ACU securities, a market for liquid instruments of high issuer quality must first come into existence. As governments are typically in all countries the single issuer with the highest credit standing and, therefore, are used by market participants as benchmarks, the major governments in the region have a potential role to play in building up a market by issuing ACU securities. If they did so early in the emergence of an ACU market, the take-off would occur much more rapidly than if market development was left to private initiatives alone, as was the case in Europe. ECU securities were first launched by private banks, while European institutions and governments used the ECU bond market only when it was already rapidly developing. We propose a different strategy for the ACU to gain time and to reduce uncertainties with respect to the success of a new currency. If, in addition, with an eye to a liquid market segment, governments launched large issues either in one go or through

fungible issues, then the instruments would be created of interest for the portfolios of central banks.

It needs to be recognized that securities markets are examples of network economics. Like a credit card whose utility is increasing with the number of acceptance points, ACU securities gain through wide acceptance by investors and borrowers. In this acceptance process not all parties are of identical importance. For this reason governments and highly-rated international organizations play a central role, acting as leaders and the private sector as followers. By accepting such a leading role, governments are not "paying" an infant-industry subsidy but, as argued above, are acting in their own interests and for their own benefits.

As shown in Steinherr (1988) foreign exchange market interventions in basket currencies have some different implications than interventions in the dollar market. In general terms, any interventions by a particular country will be diffused throughout the region.

B. A Road Map for the ACU

A tempting approach for launching the ACU would be to stand in the footsteps of the initial European experience in the 1970s. Already Boiscuvier and Steinherr (2004) argued that instead of following the European sequence of monetary union before financial market integration, Asia should reverse the sequence. The strategy followed in Europe was initially market-based as far as the bond market was concerned. It involved sequentially private banks, international institutions, and national governments. In the light of the lessons from such an experience plus the specificities of the East Asian region, we suggest a different road map, which should not be seen as a rigid sequence, for the ACU.

The main difference with respect to the European experience is twofold. First, integration is politically, economically, and financially much less advanced in Asia than it was in Europe at the time the ECU was established. Second, financial markets are less developed in most, but obviously not in all, Asian countries. Therefore, it is necessary to proceed differently. In view of the very limited capital integration and lack of a political agenda it would be helpful, if not necessary, to develop first a political vision of monetary cooperation—where it starts, how it could evolve, and where it could end—accompanied by an agenda.

First, we see the desirability of a minimal institutional infrastructure to sustain ACU developments. Second, official institutions could become early lead participants in the ACU market. This leadership of public institutions could act as a trigger for the involvement of other participants. This is particularly the case for the private sector, but also for central banks whose involvement requires a functioning ACU government bond market.

Step 1: Institutional Infrastructure Requirements

ACU financial instruments could be developed without a well developed institutional infrastructure. However, the earlier such an infrastructure becomes operational the better it will be for market development.

Governments would have to decide on the legal status of the ACU. It could be treated, as the ECU in Europe, just like any other foreign currency. This would not be very helpful. A special status would grant the ACU not all the privileges of the national currency but more rights than foreign currencies—for example, exemption from foreign exchange controls and acceptance as a means of payments for certain transactions (e.g., for foreign trade transactions).

In many national regulations investments by pension funds and insurance companies are restricted to investments in national currency. In some countries the share of total investments in foreign currency denominations is severely restricted. It would be helpful to exempt ACU-denominated securities from such restrictions and treat them like domestic currency investments.

ACU-denominated bonds would need to be traded, preferably in one well established exchange in the region. In Europe, most bonds were listed in Luxembourg but also on other exchanges. A legal framework could be developed in the country of location of the exchange dealing with ACU securities. This could become the legal reference for ACU issues worldwide.

For operations in the bond market and for ACU payments, a payment system is required. For the ECU, a group of high-quality banks in Europe with the support of the European Commission, the European Investment Bank, and the Bank for International Settlements created the ECU Banking Association whose job was to establish a cost-effective payments system in ECU. The same private response to market developments would surely occur in Asia. But an early initiative under the leadership of a reputed regional official actor (e.g., a central bank or Asian Development Bank [ADB]) would surely accelerate developments and contribute to confidence building.

Step 2: Launch of the ACU by Public Institutions

Both regional multilateral institutions and national official institutions (I.e., governments, national development banks, etc.) might act in coordination to be the leaders in the launching and nurturing ACU securities.

1. Multilateral Institutions

Some regional financial institutions would start by using the ACU as a unit of account in their own accounting. Holding their accounts in ACU rather than in dollars would be a symbolic step. Issuing bonds in that same unit would be a more profound one. Lending to borrowing countries in ACU would be an even more important step, because of its high visibility in ACU member countries.

For example, multilateral institutions such as ADB or the ASEAN secretariat, could establish their internal accounts in ACU. The ADB could start to issue bonds in ACU and to grant loans to member countries in ACU. This would be an important learning step for member country governments.

2. ASEAN+3 Member Governments

The issuance of sovereign bonds in ACU would be a way for small ASEAN countries to initiate and develop active and liquid bond markets, substituting for inexistent or less-developed domestic ones, and for larger countries within ASEAN+3 to fund widening needs of public sector funding. Governments should also attach importance to maintaining liquidity in the secondary market. Institutional investors in such countries would also benefit from being able to diversify their assets internationally while keeping close to home. The presence of such bond markets would serve as the basis for the development of derivative and options markets in ACU.

Infrastructure development with public sector support should simultaneously be implemented to ensure the functioning of the ACU bond market. This could involve a regional credit guarantee agency and a regional clearing and settlement system. In addition, the set up of East Asian bond rating agencies could be stimulated.

On the demand side, the development of the regional bond market will require national pension or provident funds to be allowed to invest a specified share of their assets in ACU-denominated sovereign or quasi-sovereign bonds. For countries with capital controls, special provisions for the ACU bond market would be an important but controlled step towards greater capital mobility. For example, in Europe several countries with extensive capital controls, such as Italy, Spain, or Ireland, exempted the ECU from such controls.[8]

[8] This is analyzed in Steinherr et al. (2006).

Step 3: ASEAN+3 Member Central Banks

ASEAN+3 member central banks could start holding a share of the rise in their foreign exchange reserves in ACU. For the central banks involved, this would put upward pressure on the external value of their currencies, particularly against the US dollar, and would contribute, at the margin, to reduce global imbalances. Doing it at the margin would prevent too wide movements in the foreign exchange market.

ASEAN+3 member central banks should start shifting part of their outstanding foreign exchange reserves into ACU. This would gradually deepen the trend triggered by the preceding move at the margin. Such a management of reserves in ACU would be training ground for a possible later development of an East Asian exchange rate mechanism.

Step 4: Private Sector

A crucial step would occur when the private sector started to issue bonds in ACU and banks begin to accept deposits and grant loans in that same unit. The private sector's involvement in both bond and banking markets are closely linked in as much as the firms which raise funds through issuance of ACU-denominated bonds can choose to hold part of them in ACU deposits. Similarly, ACU bonds could serve as collateral for ACU-denominated loans.

1. Issuance of Corporate ACU Bonds

The development of corporate bond markets in East Asia is generally considered to be a win-win solution for a region where bank-intermediated finance has been dominant. The issuance of ACU bonds by East Asian firms and the holding of such bonds by East Asian banks is an ideal way to evolve smoothly towards a more balanced type of external financing of firms. East Asian banks themselves should issue bonds as a means of external finance. An East Asian banking association or some East Asian central banks would have to be involved.

2. Private Loans and Deposits in ACU

East Asian banks would start accepting deposits and granting loans in ACU. For countries which retain capital controls, special treatment would be given to ACU business. The latter would not be treated like foreign currency business, but would be granted special privileges, in the form of tax exemptions or regulatory waivers.

APPENDIX 1: CO-MOVEMENTS OF ASEAN+3 CURRENCIES

To what extent do the exchange rates of ASEAN+3 currencies move together? We considered monthly dollar returns (exchange rate of the dollar in terms of domestic currency) over the post-East Asian crisis period, i.e., from January 1999 through March 2006. Simple correlations show that the extent of bilateral co-movement seems quite diverse. Brunei is strongly (i.e., more than 0.4) correlated with Indonesia, Japan, Korea, Myanmar, and Thailand. Three countries—Cambodia, Lao PDR, and Viet Nam—were not strongly correlated with others (except Cambodia with Thailand). Some correlations were very focused, like the PRC being exclusively correlated with Malaysia, or Indonesia and Myanmar with Singapore and Thailand. In addition, Japan is correlated with Korea, Myanmar, and Singapore, while Korea is related to Singapore and Thailand, as well as the Philippines with Thailand.

Table A1.1: Correlation Between Exchange Rate Returns of ASEAN+3 Currencies

	CAM	PRC	IND	JAP	KOR	LAO	MAL	MYA	PHI	SIN	THA	VIE
BRU	1											
CAM	0.22	1										
PRC	0.11	0.04	1									
IND	0.58	0.23	-0.03	1								
JAP	0.54	0.12	-0.01	0.05	1							
KOR	0.45	0.31	0.03	0.21	0.59	1						
LAO	0	-0.02	0.04	-0.3	0.19	0.01	1					
MAL	0.22	0.16	0.67	0.07	0.05	0.14	0.08	1				
MYA	0.54	0.1	0.04	0.17	0.62	0.31	0.17	0.06	1			
PHI	0.28	0.27	0.05	0.32	0.11	0.39	-0.1	0.15	0.19	1		
SIN	1	0.22	0.11	0.58	0.54	0.45	0	0.22	0.54	0.28	1	
THA	0.61	0.44	0.08	0.46	0.34	0.51	-0.01	0.19	0.44	0.52	0.61	1

Sample January 1999–March 2006. Monthly returns: rate of change of the average monthly exchange rate of the dollar in terms of domestic currency.

Source of data: International Financial Statistics, IMF cd-rom.

Table A1.2: Principal Component Analysis: ASEAN+3 and Outside Currencies

a. Eigenvalues and Explanatory Power

	Eigenvalues %	variation %	cumulative
PC1	5.487	22.86	22.86
PC2	2.343	9.76	32.63
PC3	1.961	8.17	40.79
PC4	1.783	7.43	48.22
PC5	1.631	6.79	55.02
PC6	1.433	5.97	60.99
PC7	1.187	4.95	65.93
PC8	1.160	4.83	70.77
PC9	1.013	4.22	74.99
PC10	0.9287	3.87	78.86

b. Weights on Currencies

	PC1	PC2	PC3	PC4	PC5
BRU	0.33504	-0.10823	0.063043	0.10999	0.14616
CAM	0.31604	0.20815	0.31663	0.28635	-0.46048
PRC	0.24288	-1.5065	1.8727	0.76639	1.0024
IND	0.049103	-0.021381	0.014104	0.10527	0.011677
JAP	0.11638	-0.011099	-0.040993	0.10278	0.079273
KOR	0.13693	-0.094572	-0.0032944	-0.048202	0.092519
LAO	0.0077936	0.026793	0.027669	-0.09787	0.041147
MAL	0.61062	-2.2323	2.7042	-0.75061	0.905
MYA	0.22329	0.049954	-0.085943	-0.14293	0.1505
PHI	0.12173	-0.10893	0.0035968	0.038877	0.27702
SIN	0.33504	-0.10823	-0.063043	0.10999	0.14616
THA	0.21405	-0.067006	-0.007214	0.040378	-0.099754
VIE	0.11814	-0.59482	-0.071987	-1.4589	-1.8361
BANG	0.00035	0.40708	-0.15003	-0.024138	-0.31754
INDIA	0.23431	-0.047957	0.13023	-0.28038	-0.20373
PAK	0.047888	0.16203	0.17461	-0.15964	-0.16409
SRI-LANKA	0.30571	-0.13079	0.13237	0.066088	0.030805
EURO	-0.077465	-0.099365	-0.034451	-0.014529	0.094945
POUND	-0.30281	-0.10547	-0.15971	-0.055193	0.023579
SWISS	0.032482	0.10959	0.14245	0.051915	0.0052173
AUSTRA	-0.011117	-0.098245	0.054482	0.032319	0.017293
NZE	-0.094783	-0.092946	0.078009	0.030438	0.017441
MEX	-0.030774	-0.013932	0.085391	0.033003	-0.13558
ARG	-0.0039432	-0.01339	-0.0032515	-0.039628	-0.0066292

Eigenvectors scaled by standard deviation of variables

Sample: January 1999–March 2006. Principal component analysis on monthly rate of change of the exchange rate of the dollar in terms of domestic currency.

Source of data: International Financial Statistics, IMF cd-rom.

Of considerable interest is the search for the presence of common regional factors among the 13 currencies. A principal component analysis is conducted including other currencies both from the region, i.e., Bangladesh, India, Pakistan, and Sri Lanka, from neighboring Australia and New Zealand, and from outside the region, the euro area, Switzerland, UK, Mexico, and Argentina. As shown in Table A1.2a., the first component, which accounts for almost a quarter of total variance, is especially interesting, since it shows a common movement of all Asian currencies included in the sample. Indeed, for this component, they all share a positive weight, while currencies from outside the region share a negative weight (Table A1.2.b, column 1). By contrast, the second principal component would seem to correspond to some global factor since the weight of most currencies both from inside and outside the region share the same sign (Table A1.2b, column 1)

Table A1.3: Relationship of Exchange Rate Returns with Regional or Global Factors

	Intercept	Regional factor	Global factor	R2
Brunei Darssusalam	-0.021 (0.33)	0.396 (11.7)	-0.128 (3.09	0.761
Cambodia	0.092 (1.87)	0.075 (2.81)	-0.049 (1.48)	0.155
PRC	-0.034 (1.50)	0.008 (1.27)	-0.048 (1.43)	0.182
Indonesia	0.187 (0.48)	1.04 (4.46)	-0.452 (1.36)	0.302
Japan	-0.003 (0.03)	0.619 (8.38)	-0.059 (0.54)	0.397
Korea	-0.249 (1.46)	0.489 (6.49)	-0.337 (2.74)	0.442
Lao PDR	1.03 (1.42)	0.172 (1.26)	0.593 (1.24)	0.044
Malaysia	-0.029 (1.78)	0.014 (1.89)	-0.052 (2.25)	0.320
Myanmar	-0.029 (0.34)	0.401 (9.45)	0.089 (1.15)	0.502
Philippines	0.311 (1.68)	0.297 (4.07)	-0.266 (2.59)	0.266
Singapore	-0.022 (0.34)	0.396 (11.7)	-0.128 (3.09)	0.761
Thailand	0.081 (0.64)	0.542 (11.5)	-0.169 (2.13)	0.663
Viet Nam	0.154 (4.53)	0.006 (0.44)	-0.032 (2.54)	0.049

Sample: January 1999–March 2006.

Dependent variable: monthly rate of change of the exchange rate of the dollar in terms of domestic currency. Regional and global factors, see Table A1.2. t-statistic in parentheses.

Source of data: International Financial Statistics, IMF cd-rom.

An important dimension of common movements of ASEAN+3 currencies is to what extent these movements pertain rather to a regional factor or to a common global factor. In Table A1.3., we thus regressed the monthly dollar return of each ASEAN+3 currency on both the regional and the global factor, as identified in Table A1.2. The coefficient on the regional factor is uniformly strong and significant in eight countries. Only the currencies of PRC, Lao PDR, and Viet Nam do not show any relationship with the regional factor. For the riel and the ringgit, there is some weak relationship but only marginally significant. The global factor plays a significant role in Brunei, Korea, Malaysia, Philippines, Singapore, Thailand, and Viet Nam.

The same three variables—i.e., the domestic currency dollar return, the regional factor, and the global factor—were included in a vector autoregressive system with one lag. The variance decomposition at a twelve-month horizon (Table A1.4) showed that the contribution of the regional factor is generally much stronger that the share of the global factor. Indeed, the former accounts for two-thirds of the variance in Brunei, Singapore, and Thailand, one-third to two-fifths in Japan, Korea, and Myanmar, and one-fourth to one-sixth in Cambodia, Indonesia, and the Philippines. The global factor only plays a significant, but more moderate role, with one sixth of variance, in PRC, Malaysia, Myanmar, and Thailand.

Table A1.4: Variance Decomposition of Exchange Rate Returns: Regional or Global Factors?

Horizon	S.E.	PC1REG	PC2GLOB	DLcountry
Brunei				
1	1.05	72.68	3.36	23.95
		(5.02)	(1.98)	(4.41)
12	1.11	66.47	11.46	22.05
		(7.05)	(6.70)	(4.46)
Cambodia				
1	0.49	13.60	2.70	83.69
		(6.71)	(3.53)	(7.15)
12	0.50	13.35	3.44	83.20
		(6.54)	(4.20)	(7.27)
PRC				
1	0.1673	2.84	19.14	78.01
		(3.64)	(7.22)	(7.64)
12	0.1840	3.78	18.35	77.86
		(3.79)	(7.80)	(8.23)
Indonesia				
1	4.50	24.18	2.06	73.75
		(8.08)	(2.67)	(8.02)
12	4.72	22.18	5.75	72.06
		(7.64)	(4.95)	(7.96)
Japan				
1	2.29	43.03	0.37	56.58
		(7.93)	(1.21)	(7.90)
12	2.36	42.42	2.74	54.82
		(8.05)	(4.24)	(7.96)
Korea				
1	1.81	37.30	5.14	57.55
		(7.95)	(3.62)	(7.76)
12	1.93	36.91	6.52	56.56
		(8.30)	(4.77)	(8.27)
Malaysia				
1	0.13	6.07	19.11	74.81
		(5.13)	(7.11)	(7.69)
12	0.16	5.13	16.11	78.75
		(5.17)	(7.77)	(8.51)
Lao PDR				
1	4.13	0.083	5.35	94.55
		(1.68)	(4.67)	(4.83)
12	4.82	0.51	6.64	92.84
		(3.18)	(7.16)	(7.77)

Table A1.4 (cont .)

Myanmar				
1	1.17	35.82	0.93	63.24
		(8.25)	(1.89)	(8.16)
12	1.38	31.54	16.32	52.12
		(7.15)	(7.36)	(7.78)
Philippines				
1	1.48	19.01	7.08	73.90
		(7.58)	(4.84)	(8.18)
12	1.60	18.67	9.35	71.97
		(7.55)	(5.80)	(8.56)
Singapore				
1	1.05	72.68	3.36	23.95
		(4.89)	(2.06)	(4.39)
12	1.11	66.47	11.46	22.05
		(6.71)	(6.27)	(4.48)
Thailand				
1	1.42	62.01	3.94	34.03
		(6.66)	(2.61)	(6.11)
12	1.64	56.28	15.65	28.06
		(8.16)	(8.00)	(6.20)
Viet Nam				
1	0.20	0.32	1.57	98.10
		(1.91)	(2.92)	(3.53)
12	0.23	1.92	3.34	94.73
		(4.24)	(4.95)	(6.76)

Sample from January 1999 through March 2006.

VAR(1) including three variables: Regional and global factors, (PC 1 and PC2 in table 2) and the monthly rate of change of the exchange rate of the dollar in terms of domestic currency. Standard errors between brackets (1000 Monte Carlo repetitions).

Source of data: International Financial Statistics, IMF CD Rom.

APPENDIX 2: ACU BOND HOLDINGS: RISKS ORIGINATING FROM VARIOUS SOURCES

The risk/return characteristics of ECU-denominated bonds were such that the ECU figured prominently in global portfolios. Somewhat surprisingly, the share of ECU assets even increased for investors moving along the efficiency frontier, that is, investors who did not wish to minimize risk. This outcome suggests that the ECU had more to offer beyond hedging properties and, for that matter, afforded an attractive remuneration for the risks it involved. What were those risks?

We identified three types of risk that are analytically distinct. In all but the notional European habitat, the ECU was a foreign currency and as such contained a "foreign currency" risk. We show that this component was the largest risk factor. Of course, in a European habitat, the "foreign currency" risk disappeared and the ECU became a very low-risk investment.

The second source of risk derived from the open-ended construction of the ECU. ECU interest rates reflected expected changes in its currency weights and such expectations could be, and usually were, off the mark. Therefore, there was a type of risk which did not exist for a basket of currencies replicating the ECU. This risk was quite small for short maturities but could rise up to 30 basis points (bp) for longer maturities. This type of risk existed in all habitats including the European one. It could only be eliminated by either fixing the weights rather than the currency units in the ECU, or by doing away with the basket construction altogether.

Both "foreign currency" and "basket" risks are habitat-specific. An ultimate source of risk derived from basket revisions and liquidity problems; the premium for this type of risk was reflected in the spread between the theoretical and market interest rates of the ECU. Unlike the two previous ones, this particular type of risk was similar across all habitats. Its size was small relative to the "foreign currency" risk, but large relative to the "basket" risk. This type of risk could have been substantially reduced if ECU weights had no longer been revised at five-year intervals, as argued by Girard and Steinherr (1989a).

For remunerated financial assets that are traded internationally, it is obvious that one cannot define risk in an absolute sense. Modern portfolio theory suggests that risk can be defined in a meaningful way only by reference to a relevant portfolio. Any asset has two risk components: one representing the risk of the whole market (market risk) and one that is asset-specific and defined in relationship to this market (the “beta” value of the asset). Analysis of the risk of any particular foreign currency asset could be carried out through the same approach. It would require construction of an international portfolio which would serve as a benchmark for the purpose of assessing the degree of risk associated with the assets available in a particular currency. This approach raises a number of conceptual difficulties. The most significant appears to revolve around how to arrive at an appropriate definition of such an international benchmark portfolio which, moreover, must be habitat-specific.

This is why we adopted a different approach. We took national habitats for benchmarks and were, therefore, only able to assess the ECU-specific risk in relation to the currency of a specific national habitat. However, because we also retain an ECU habitat, the non-national habitat approach is not altogether overlooked. Such an approach, if more limited, seems warranted not only on account of the greater simplicity it affords but also for the task at hand: that is, the attractiveness of the ECU as an alternative to national currency assets in European habitats.

In habitat h we define:

$$PT_h = PE_h + S \qquad (A1)$$

where PT h is the difference between the ex post return on an ECU-denominated asset converted into currency h on the one hand and, on the other hand, returns on assets

denominated in currency h; PEh is the difference between the ex post theoretical return on the ECU and effective returns on assets in habitat h; S is the spread between the effective and theoretical ECU returns.

The spread S is independent of the choice of habitat, but PT h (defined in equation A1) is clearly habitat-specific. However, the contribution of the spread to the total variability (risk) of an ECU asset varies across habitats, as long as the covariance (Cov) between PE and S is different from zero:

$$V(PT\ h) = V(PEh) + 2\ Cov\ (PEh, S) \qquad (A2)$$

The variable PT h assumes different values across time periods, which is precisely the risk of holding ECU assets. For a given time period, the volatility of PT h (measured by its standard deviation, V) is a measure of the risk in holding ECU-denominated assets in habitat h. The average value of PT h is a measure of the average risk premium an investor in habitat h will require if he is to hold an ECU asset.

Equation (A1) can be used to compute average risk premiums for a choice of relevant time periods. This equation shows that the total ECU risk can be decomposed into two elements, namely PEh and S.

The risk premium associated with the variable PEh is usefully called a premium for “intrinsic” risk. This risk itself originates in two sources: one is the individual risk premium attached to every single currency in the basket from the viewpoint of an asset holder in habitat h. This can be called “foreign exchange risk.” Another, much less apparent source of risk derives from the way ECU interest rates are determined. For a detailed description, see Girard and Steinherr (1989b).

The theoretical ECU interest rate for a very short-term instrument (say, overnight) will simply be the average of appropriate national interest rates weighted by the actual shares of currencies in the ECU. However, for longer maturities, consistency requires that covered interest rate parity not be overlooked. This means that interest rate spreads are compensated by corresponding forward exchange discounts. Therefore, on this basis, one cannot assume that currency shares in the ECU remain constant. Rather they must be projected using forward exchange discounts equal to interest rate differentials.

While interest rate parities yield consistency, experience shows that forward exchange rates are “blue” (i.e., best-linear-unbiased) estimators, though their record is very poor. This means the margin for error is large, implying higher risk. Such risk would not exist were the components of the ECU held directly and separately. For this reason we call it “basket risk.” Interest rates on each component currency were determined in the relevant domestic markets and given current weights; the return on an ECU-equivalent basket is determined without bringing changing weights into the picture.

The second component in equation (A1) is the spread. Spreads are influenced by several factors, such as measurement errors, illiquidity in some component currencies, shocks too specific to domestic markets to spill over to Euromarkets (this is important since the theoretical ECU interest rate ought to be computed on the basis of tax-free euro-instruments, but for reasons of data availability is, in fact, computed on the basis of domestic market rates), and, finally, any degree of uncertainty about future basket revisions. Thus, the spread is a measure of a premium which includes several distinct factors, of which only two are associated with risk: the risk of illiquidity which characterizes ECU markets to various degrees over time and uncertainty about future basket revisions. For empirical results see Girard and Steinherr (1989b).

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