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ARTIFICIAL CURRENCY UNITS:
THE FORMATION OF
FUNCTIONAL CURRENCY AREAS

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INTERNATIONAL FINANCE SECTION

DEPARTMENT OF ECONOMICS

PRINCETON UNIVERSITY

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Artificial Currency Units: The Formation of Functional Currency Areas

A basic tenet of monetary economics is that the moneyness of an economic object is a matter of degree. The dividing line between money and nonmoney is inevitably arbitrary, because money fulfills not one but three functions, which are met in different degrees by different objects. Consequently, depending on the weights attached to the three functions, diverse orderings can be made of the degrees of moneyness of particular economic objects. The functions of money (1) as a unit of account, (2) as a medium of exchange, and (3) as a store of value combine to impart to an object the quality of generalized purchasing power. How and when an economic object assumes this quality in actuality involves a transformation process that cannot be delineated once and for all, because it constitutes a complex component of the course of economic development, both national and international. As a result, there is a wide diversity of cases of the transformation of particular economic objects into money.

Amid the turmoil and upheaval of the current international monetary system, a series of eventful developments are under way involving the emergence of new artificial (or composite) currency units. The number of such units is growing constantly as a reflection of mounting discontent with the practice of using one or another national currency as the major unit of account in international transactions, either official or private. Because the values of such key national currencies as the U.S. dollar and the British pound have been highly unstable since the emergence of floating exchange rates, there have been growing efforts to create substitute, so-called "artificial," currency units for use in international accounting and international settlements. Some of the efforts have been official, others unofficial.

This essay focuses upon the artificial currency units (ACUs) that have come into commercial and official use in recent years. A prominent example of such an ACU is the Special Drawing Right (SDR) of the International Monetary Fund, but other ACUs have been assuming a vital role in international finance, even though they have been less publicized or hardly recognized. Our objective is the dual one of reviewing the noteworthy ACUs and analyzing their economic significance.

Accordingly, our task is divided into three parts. First, we explore the conceptual underpinnings of the ACU phenomenon in light of the history

of its recent emergence and dissemination. Next, we consider the essential properties of the various ACUs in their wide diversity. Finally, we explore the implications of the ACU concept for the theory of optimum currency areas.

Conceptual Underpinnings

It has been observed that the introduction of a unit of account in terms of which to compare the values of different goods and services was as important for economies as was the invention of the wheel for technology. The ACUs that constitute the focus of our study have arisen in response to the challenge of devising a common international unit of account among diverse national currencies. Both for rational economic calculation and for the transmission of economic information, the emergence of ACUs illustrates the international monetary application of the adage, necessity is the mother of invention.

At its present stage of development, an ACU's main function is as a numeraire, or unit of account, in international transactions. As such, an ACU is simply a yardstick to measure the value of a transaction, with the aim of keeping that value as stable as possible. Therefore, most ACUs are not full-fledged money, being used neither as a medium of exchange nor a means of payment. Even though the value of a payment obligation is expressed in an ACU, the actual payment is generally made in one of the national currencies. It should be noted, however, that there is nothing inherent in the concept of an ACU to limit its role to that of a numeraire. The main arguments of this essay are developed with an eye to the potential, as well as the likelihood, of ACUs playing an increasingly important role as full-fledged international money. In an ACU, the two functions of money as a unit of account and a medium of exchange are separated in current usage, and in most instances only the former function is fulfilled. Such separation is by no means unknown in monetary history: from the reign of Charlemagne until the French Revolution, the unit of account and the means of payments were separated (Guggenheim, 1973, p. 93). For the time being, therefore, we define an ACU as an international quasi-money serving as a numeraire in international transactions.

The concept of an ACU is not new. As long ago as the late Middle Ages, when every kingdom, principality, and small town had its own currency, such ACUs as the Mark-Banco of Hamburg and the Florin-Banco of the Amsterdam Wissel-Bank were generally used to settle accounts in international trade (Collin, 1964, p. 27). By the end of the nineteenth century, however, the old types of ACUs had practically

disappeared, because the gold standard made possible both monetary stability and smooth settlements in international trade.

As a result of recurring instability among national currencies after World War I began, some international institutions and treaties started to include provisions for ACUs. For example, from its inception in 1930 the Bank for International Settlements has expressed its financial statements in an ACU that has a gold weight of 0.29032 gram of fine gold per unit, which corresponded to the gold content of one Swiss franc before its devaluation in 1936. The European Payments Union, which commenced operation on July 1, 1950, adopted an ACU called the European Unit of Account (EUA) that had a gold weight of 0.88867 gram of fine gold per unit. This gold value was the same as that of one U.S. dollar prior to the increase in the official price of gold from \$35 to \$38 per fine ounce, effective May 8, 1972. The European Monetary Agreement, which replaced the European Payments Union on December 27, 1958, also used the EUA as its basic unit of account until the Agreement came to an end on December 31, 1972.

In general, we can divide ACUs into two types. The first comprises ACUs created by official institutions primarily for official international transactions. The second comprises ACUs introduced at the initiative of private banking enterprises for commercial and financial transactions. There has, however, been active cross-fertilization of ideas between private and official institutions in establishing ACUs. When an official institution creates an official ACU, it may borrow the idea from a private ACU, as in the case of the IMF's "new" SDR, which is patterned after the currency-basket, or currency-cocktail, concept of the Eurco (a private ACU). On the other hand, private banking institutions may simply start to use an official ACU for private transactions after making a few modifications. For example, in 1961 the Kredietbank in Luxembourg introduced the European Economic Community's EUA (an official ACU) as the unit of denomination for private bond issues in the international capital market. Nevertheless, it is helpful as an expository device to divide ACUs into official and private units according to their principal uses.

While the ACUs used prior to the nineteenth century were mostly private ACUs employed for international trade settlements, the first ACUs of this century were created by official international institutions for use in their official transactions. In the late 1950s and early 1960s, however, the wide use of official ACUs in international public agreements led some private bankers and scholars to inquire whether such a device could usefully be applied to private international contracts. For example, Triffin wrote in 1957:

A first step in this direction [toward monetary integration in Europe] might be to legalize the use of exchange guarantees in terms of the EPU unit, in the writing of private as well as public contracts. This could aid greatly in the revival of capital markets, now paralyzed by exchange fears and risks (p. 291).

As noted above, the first private ACU was inaugurated in 1961 when, with the help of a bank syndicate led by the Kredietbank, a large Portuguese oil company, SACOR, floated a bond issue denominated in an ACU called the EUA, which was a modified form of the official EUA being used by the European Monetary Agreement. The SACOR issue, in a principal amount equivalent to \$5 million, was offered simultaneously in several major European countries and was a huge success, being over-subscribed more than five times (Kredietbank, 1969). Other borrowers quickly followed suit, and in the next ten years about thirty EUA bond issues were floated in the international capital market, for a total volume of about \$340 million.

No additional ACUs were introduced during the 1960s. Thereafter, however, a host of official and private ACUs were created, some of them as a reflection of unsettled international monetary conditions such as dollar inconvertibility and the floating of major currencies. The list includes the SDR (1970), ECU (1970), Eurco (1973), B-Unit (1974), Arcru (1974), AMU (1974), and IFU (1975). The division of these ACUs into official and private ACUs has more than taxonomic interest. While private ACUs have thus far been employed only as units of account, official ACUs have sometimes also been used to some extent as media of exchange.

For example, an IMF member country participating in the SDR system is able to use SDRs not only to acquire national currencies from other members but also to pay certain charges it has incurred to the IMF (IMF Articles of Agreement, Art. XXV, Sec. 7). In this case, the payment is accomplished through a transfer from the paying country's SDR account to that of the IMF. This transaction is no different in principle from private transactions by check effecting demand-deposit transfers from a debtor's account to a creditor's. To the extent that an obligation is discharged directly through the interaccount transfer of SDRs, the SDR is used not only as a unit of account but also as a medium of exchange. Thus, the SDR is international legal tender as far as those IMF transactions are concerned.

However, no similar occasions have so far arisen for private ACUs to be used as a medium of exchange. Private ACUs are used primarily to denominate bond issues. Actual payments for bonds by purchasers, as

well as service payments by borrowers (interest and principal), are all carried out in a major national currency. The role of a private ACU is thus confined to that of a unit of account whose sole function is to determine payment obligations in terms of a national currency, while keeping the face value of the bond as stable as possible. It would be feasible, however, for a private ACU to serve also as a medium of exchange if a banking institution accepted demand deposits denominated in the ACU from private parties and cleared transactions through book-entry transfers.

In monetary theory, it is axiomatic that the role of money as a widely accepted means of payment is a matter of social convention. This social convention can be established in a variety of ways: (1) a governmental authority can enforce the acceptance of a certain object as payment, rendering it legal tender in fulfillment of debt obligations; (2) the convertibility of an object into something else whose status as money is already established can be guaranteed by law or contract; (3) the members of a group can pledge themselves to accept a certain object as a medium of exchange among themselves; and (4) an important member of a group can unilaterally accept a certain object in final settlement of payments due it, the importance of the member being evinced by the fact that other members of the group follow suit. The essential difference between national currencies and ACUs is that the former developed in a domestic context as essentially *national* means of payment, while the latter have been created exclusively in the context of international transactions, initially as units of account but with the potential of being developed to a limited extent into *international* means of payment.

On the international level, enforcing the acceptance of a certain object as a means of payment requires formal agreement among governments to establish an international reserve currency. The introduction of the SDR illustrates the use of this route. Although the SDR was introduced before the breakdown of the Bretton Woods system, its development has been given major impetus by the continuing post-Bretton Woods search for a stable unit of account to replace the dollar. Other ACUs may combine to varying degrees the other three ways listed above of establishing the social convention for a widely accepted means of payment. In the absence of an international legislature with the power to confer legal-tender status, establishment of the social convention leading to the emergence of a new international currency is not an instantaneous event but, rather, a time-consuming social-adjustment process.

The development of an ACU as a means of payment in international transactions may ensue from the creation of bank deposits denominated

in that ACU. To take the SDR for illustration, suppose that investors seek to keep some of their liquid financial assets denominated in SDRs in order to reduce the exposure to foreign-exchange risk inherent in a national currency. Just as the desire of the Soviet authorities to keep their dollar deposits outside the United States led to development of the Euro-dollar market in the late 1950s, a desire of investors wary of exchange risks to keep their liquid assets in SDRs may ultimately lead to the development of an SDR money market. International banks may soon be willing to accept deposits denominated in SDRs because a potential demand for SDR funds already exists, as manifested by recent SDR bond issues by the Swiss Aluminum Company, the Swedish Investment Bank, and Électricité de France. The process, indeed, is already under way. In July 1975 the Bank Keyser Ullmann in Geneva (a subsidiary of Keyser Ullmann of London) announced that it would henceforth accept demand and time deposits denominated in SDRs. These SDR deposits are to be convertible at any time into any currency at the SDR exchange rate applicable on that day. Similarly, in August 1975 the Chase Manhattan Bank in New York instituted a range of banking facilities in SDRs, including loans, deposits, and futures trading. As this process spreads and as more international transactions are denominated in SDRs, banks may begin to allow direct transfers between SDR accounts, internally and then between banks. In consequence, the SDR may be transformed from mere numeraire (international quasi-money) into an outright means of payment (full-fledged international money).

In order to evaluate the evolving role of ACUs and their economic implications, it is necessary to consider first the mechanics of the various ACUs—how they have developed and their essential properties. Accordingly, we next analyze the distinctive features of various ACUs. Table 1 summarizes the essential characteristics of existing ACUs.

Official ACUs

There are at least three official ACUs: the European Economic Community's European Unit of Account (EUA), the IMF's Special Drawing Right (SDR), and the Asian Monetary Unit (AMU) of the Asian Clearing Union. Each has been undergoing change since its inception. In the following sections, we take up these official ACUs in the order of their appearance.

EUA: Old and New

As noted above, the European Unit of Account was inaugurated in 1950 by the European Payments Union for use as its official accounting unit. It has remained in use in the European Monetary Agreement, as

TABLE 1
SUMMARY CLASSIFICATION OF ARTIFICIAL CURRENCY UNITS

<i>Type of ACU</i>	<i>Year of Creation</i>	<i>Value Tied To:</i>	<i>No. of Currencies in Basket</i>
Official:			
EUA:			
Old	1950	Gold	—
New	1975	Currency basket	9
SDR:			
Old	1970	Gold	—
New	1974	Currency basket	16
AMU	1974	Currency basket	16
Private:			
EUA:			
Old	1961	Gold	—
New	1972	Gold	—
ECU or EMU	1970	Immutably fixed exchange rates	—
Eurco	1973	Currency basket	9
Arcru	1974	Current exchange rates	8 out of 12
B-Unit	1974	Currency basket	5
IFU	1975	Currency basket	10

NOTES TO TABLE 1:

EUA: European Unit of Account.
 SDR: Special Drawing Rights.
 AMU: Asian Monetary Unit.
 { ECU: European Currency Unit.
 EMU: European Monetary Unit.
 Eurco: European Composite Unit.
 Arcru: Arab Currency-Related Unit.
 B-Unit: Barclays Unit.
 IFU: International Financial Unit.

well as in the European Economic Community, the European Coal and Steel Community, and the European Investment Bank. The value of one official EUA was originally fixed at a gold weight of 0.88867 gram (the same as in the gold-linked SDR). However, the link of the official EUA value to a fixed gold content proved impractical after the partial abandonment of the Bretton Woods system. Major currencies have been floating against each other in recent years, and their market exchange rates have diverged widely from their par values. In consequence, the market value of the gold-linked EUA could not be realistically expressed in terms of major currencies by way of the official gold definitions of the respective currencies, because the *official* gold content (expressed by the par value) of a floating currency may be far different from the *actual market* value of the currency and, more important in this context, far different from the

market price of gold in that currency. For example, the official gold content of one U.S. dollar was fixed at 0.736662 gram per dollar in October 1973, or \$42.22 per fine ounce of gold. At this official price for gold, one official EUA would equal \$1.21. Based on a market price for gold of \$170 per ounce, however, one official EUA would be worth about \$4.86, or about four times the dollar value based on the official price of gold. Such an anomaly came to apply more or less to European currencies as well, making it highly impractical to link the official EUA to gold. As an interim response to this difficulty, the gold parity of the official EUA was abandoned, and an average representative rate for floating currencies was used until a new official EUA was created in March 1975.

The link with gold is completely severed in the new EUA, which is patterned instead after the SDR or the Eurco, employing the currency-basket concept. The new official EUA consists of fixed fractions of nine EC currencies, as follows:

$$1 \text{ EUA} = \text{DM } 0.828 + \text{F } 1.15 + \text{£ } 0.0885 + \text{Lit } 109 + \text{f } 0.286 \\ + \text{BF } 3.66 + \text{DKr } 0.217 + \text{£Ir } 0.00759 + \text{Lux F } 0.14.^1$$

Because all the component currencies are those of EC member countries, the value of the new official EUA can reflect the EC economies more closely than would the SDR. In fact, this consideration was the main reason why the European Communities decided to use a new, improved EUA rather than the new SDR, even though new versions of both ACUs are based on the same currency-basket concept. The only difference between the new official EUA and the new SDR lies in the different currency compositions and the different relative weights of the component currencies. The currency basket of the new official EUA is composed of nine EC currencies, while that of the new SDR is composed of the currencies of sixteen IMF member countries which had shares in world exports of goods and services averaging more than 1 per cent in 1968-72. The relative weights of the component currencies in the new official EUA were based on the gross national products and world-trade shares of Community members, while the relative weights of the component currencies included in the new SDR are broadly proportionate to the countries' exports, with some ad hoc allowance for each currency's relative importance in the world economy.

For both the SDR and the official EUA, however, the current relative weights of the component currencies in the respective currency baskets differ from the weights of the base date, owing to the subsequent appreciation or depreciation of each component currency. The base date of the

¹ See the Table of Currency Symbols on page 29.

new official EUA is June 28, 1974, even though the new EUA was formally adopted on March 18, 1975. This choice of base date was dictated by the decision to retain a link with the new SDR, whose base date is also June 28, 1974, as will be explained in the following section.

SDR: Old and New

The SDR came into existence formally on January 1, 1970. Originally, one SDR had a fixed gold content of 0.88867 gram of fine gold, whose value was equal to one U.S. dollar before May 1972, when the dollar was devalued officially to 0.81851 gram of fine gold. Since the value of the SDR was linked to a fixed gold content, devaluations or revaluations of currencies could not affect it. Therefore, when a currency was devalued against all other currencies, one SDR commanded more units of that currency than it did before the devaluation. In order to set the value of the SDR in terms of currencies, the IMF first fixed the value of the SDR in terms of the U.S. dollar in October 1973, at the par value of the dollar (for example, from October 1973, SDR 1 = \$1.20635). Correspondingly, the IMF derived exchange rates for the SDR against nondollar currencies from the market rates for these currencies against the dollar. We may call this original SDR the *old* SDR.

The widespread floating of major currencies in February 1973 caused the value of the old SDR to fluctuate wildly in terms of these currencies, even though the value of the SDR in terms of the U.S. dollar was fixed at the dollar's par value. The problem became more acute in mid-1973 as the U.S. dollar further weakened against the currencies of major European countries, causing the value of their SDR holdings to decline markedly in terms of their own currencies. Consequently, there was growing opposition to linking the value of the SDR to only one currency, the U.S. dollar. It was felt that the SDR value should be linked instead to a "basket" of major currencies in order to assure the relative stability of the SDR: such stability was thought essential in establishing the SDR as the main reserve asset in a reformed international monetary system.

Effective July 1, 1974, therefore, the IMF changed the method of valuing the SDR. The *new* SDR is now valued entirely by the market exchange rates of sixteen component currencies included in the so-called "standard basket." The new SDR contains a fixed amount of each of the sixteen currencies, as follows:

$$\begin{aligned} 1 \text{ SDR} = & \$ 0.40 + \text{DM } 0.38 + \text{£ } 0.045 + \text{F } 0.44 + \text{¥ } 26 \\ & + \text{Can\$ } 0.071 + \text{Lit } 47 + \text{f } 0.14 + \text{BF } 1.6 + \text{SKr } 0.13 \\ & + \text{\$A } 0.012 + \text{DKr } 0.11 + \text{NKr } 0.099 + \text{Pta } 1.1 \\ & + \text{S } 0.22 + \text{R } 0.0082. \end{aligned}$$

As noted earlier, relative weights for the component currencies were based on the respective countries' shares in world exports of goods and services in 1968-72, modified slightly to recognize nontrade aspects of the countries' importance in the world economy. The currency fractions in the SDR standard basket were derived from the relative weights of component currencies based upon the market exchange rates on the base date of June 28, 1974. In order to preserve continuity of valuation for IMF operations and transactions, it was decided to ensure that the sum of the above currency fractions, valued at the market exchange rates on the base date, would yield the same value for the SDR in terms of the U.S. dollar as did the *old* SDR, that is, $\text{SDR } 1 = \$1.20635$. Since July 1, 1974, however, the value of the new SDR in terms of the U.S. dollar and other currencies has fluctuated from day to day as market exchange rates have changed. Using the daily market exchange rates of the component currencies against the U.S. dollar, the IMF calculates every day the rate for the new SDR in terms of the U.S. dollar by summing up the dollar value of the currency fractions. It then derives rates for the SDR in terms of other currencies by converting the dollar value of the SDR into other currencies at that day's market exchange rates.

During the first twelve months of its existence, the new SDR appreciated about 3 per cent in terms of the U.S. dollar. Thus the SDR appreciated vis-à-vis the dollar much less than, say, the German mark or the Swiss franc. This outcome demonstrates the relative stability of the SDR resulting from the fact that it is based on a number of currencies instead of one or two. The current formula for valuing the SDR is subject to periodic review by the IMF. Conceivably, either the number of component currencies could be altered or their weights could be changed by introducing a new set of currency fractions. These changes would take place if some countries were to experience a substantially reduced trade volume or if their relative economic importance were to decline for other reasons.

Yet, legally, the gold content of the new SDR remains the same as that of the old SDR. In conformity with Article XXI, Section 2, of the Articles of Agreement of the IMF, the gold value of one SDR is 0.888671 gram of fine gold. With this gold weight, the current *market* value of the SDR in U.S. dollars would be about \$4 per SDR on the basis of \$130 per ounce of fine gold. In contrast, the *official* dollar value of the SDR, in terms of the standard-basket concept, is about \$1.17 per SDR, only a small fraction of its gold-equivalent market value. This divergence between the gold value of the SDR and the standard-basket value of the SDR is the result of the two-tier gold-valuation system implicitly imbedded in the

present IMF Articles of Agreement. In the day-to-day conduct of IMF operations and transactions, only the standard-basket value of the SDR is applied, rendering inoperative in practice IMF Article XXI, Section 2. This anomalous situation is a vestige of the valuation method of the old SDR, which in turn was adopted as an outgrowth of the U.S. dollar's definition in terms of gold before the 1971 suspension of the official commitment to the gold convertibility of the dollar. In the meeting in Kingston, Jamaica, in January 1976, the Interim Committee of the IMF Board of Governors on Reform of the International Monetary System endorsed the abolition of the official gold price in the new IMF Articles of Agreement, the process of whose formal adoption could take about eighteen months. At that time, the SDR would be valued only in terms of the standard basket of currencies.

The fact that the SDR still represents legally a fixed gold weight makes it tempting to compare the SDR to the gold certificate in the U.S. central banking system. Since the SDR does not assume the form of a certificate but appears only as a bookkeeping entry in the IMF General and Special Drawing Accounts, the SDR would appear to be similar to the gold-certificate credits recorded on the books of the U.S. Treasury for the Federal Reserve banks. In fact, the manner in which the IMF transfers SDRs from the account of one country to that of another to effect the financing of international balance-of-payments deficits seems reminiscent of the distribution by the Federal Reserve Board of gold-certificate credits among the individual Federal Reserve districts' reserve banks in response to deficits in interdistrict balances of payments (McCalmont, 1963). Such a comparison, however, is more misleading than revealing, for the settlement of international accounts on the books of the IMF in terms of SDRs takes place sporadically, not continually, and at the behest of individual governments. In contrast, the reallocation of gold-certificate credits among Federal Reserve banks is effected continually so as to even out the ratio of gold-certificate reserves to liabilities of the various banks. Thus far, therefore, SDRs in the IMF remain fundamentally different in function from gold-certificate credits in the Federal Reserve System.

As a result of the considerable weakening of the U.S. dollar on the foreign-exchange market in early 1975, a number of countries have severed the connection of their currencies to the U.S. dollar and instead pegged their currencies to the SDR. Among these countries are Iran, Burma, Saudi Arabia, and Qatar. The members of the Organization of Petroleum Exporting Countries have been discussing the possibility of switching oil pricing from U.S. dollars to SDRs. But one shortcoming of the new SDR is that it is considered by many countries to be insufficiently

representative of the world economy, since it is composed of only sixteen currencies. Accordingly, such countries as Kuwait, Australia, New Zealand, and Finland have pegged their currencies neither to the U.S. dollar nor to the SDR but to special currency baskets of their own making. For example, Kuwait has chosen a collection of currencies as her own "standard basket" to reflect her trade relationship more accurately than the "standard basket" of the SDR. The new official EUA, described in the previous section, can be viewed in a similar light. It is nothing but a unique standard basket of the currencies of the European Communities, chosen because the SDR is not representative enough of the EC economies. We may be witnessing the emergence of currency blocs based on regional ACUs as a result of the failure of the new SDR to play the role of a global ACU truly representative of the total world economy. This possibility is explored in the concluding section.

Amid the proliferation of regional or even national ACUs, moves are afoot to broaden the use of the SDR in the private sector as the SDR becomes more familiar to private institutions. For example, an Austrian commercial bank has recently obtained permission from the Austrian government to issue certificates of deposit denominated in SDRs, while the International Air Transportation Association has tentatively agreed to abandon pricing in dollars and pounds and instead to set overseas air fares in SDRs, effective April 1977. International banking institutions competed with one another in exploring the possibility of floating bond issues denominated in SDRs. Ironically enough, the three major commercial banks of Switzerland (a country which is not a member of the IMF) jointly introduced the first SDR bond issue in May 1975. Market reception of the first SDR issue was enthusiastic, and, consequently, the amount of the issue was increased from SDR 30 million to SDR 50 million to meet, at least partly, the enormous demand. As mentioned earlier, a Swiss bank and a major American bank have instituted facilities for bank deposits denominated in SDRs; acquisitions and withdrawals of SDR deposits can be made in any major convertible currency, and the SDR deposits are at any time convertible and transferable in any currency at the exchange rate valid on that day. These private uses of the SDR are still in their beginning stage wherein the role of the SDR is limited to that of a unit of account. Its use also as a medium of exchange is so far limited to official IMF transactions. In the course of time, however, if the use of the SDR for accounting purposes takes hold, the SDR may undergo transformation into a settlement vehicle even in private transactions as confidence grows in its ready convertibility into national currencies.

AMU

In December 1974, the Asian Clearing Union was established in Bangkok. Its membership includes India, Iran, Sri Lanka, Nepal, Pakistan, and Bangladesh. It was agreed that the accounts of its member countries would be kept in the Asian Monetary Unit (AMU), whose value is equal to the SDR. The primary purpose of the Asian Clearing Union is to provide a facility to settle multilaterally payments for current transactions among the member countries. Thus, the role of the AMU is similar to that of the EUA in the European Payments Union and the European Monetary Agreement, with this difference: unlike the official EUA, the currency composition of the AMU is the same as that of the SDR, and the variability of its value is identical with the variability in the value of the SDR. Thus, in the AMU we are discerning the first instance of adoption of the SDR by a regional organization. This development constitutes a noteworthy divergence from the precedent of the European ACU, which is based upon the currencies of the European countries alone. For all practical purposes, therefore, the AMU is the SDR utilized for a regional, rather than a global, payments union.

Private ACUs

The private international banking community has been no less imaginative than its official counterpart in creating artificial currency units that may be suitable for private transactions. Most of the private ACUs were established to meet the need for a satisfactory unit of account for international bond issues. Previously, when an international bond issue was denominated in a national currency, international investors often saw the value of their investments decline substantially in terms of their domestic currency as a consequence of subsequent exchange-rate movements. On other occasions, international issuers of bonds denominated in a foreign currency saw their debt burden increase in terms of their domestic currency. In order to minimize for both borrowers and investors the foreign-exchange risks inherent in long-term bond issues, the banking community created several artificial currency units, such as the private EUA, ECU, Eurco, Arcru, and IFU. On the other hand, some ACUs, such as the B-Unit (Barclays Unit) and the commercial Eurco, were created to facilitate commercial transactions.

Not all private ACUs are the product of the current floating-rate regime. Of the private ACUs listed above, two, the private EUA and the ECU, were developed under the fixed-exchange-rate system before the

U.S. dollar was officially rendered inconvertible into gold in August 1971. There was a need for private ACUs even under the fixed-exchange-rate system, because the value of such key transactions currencies as the U.S. dollar and the British pound often changed as a result of the revaluations or devaluations of other currencies. The abandonment of the fixed-exchange-rate system in early 1973 accelerated the development of private ACUs. But even if there is a return to a fixed-exchange-rate system, private ACUs will not necessarily disappear. They will be needed until the establishment of a stable worldwide currency unit whose value is not dependent upon the vagaries of diverse national economic policies.

The following sections treat the above-mentioned private ACUs individually, in the order of their appearance.

EUA: Old and New

The European Unit of Account (EUA) was the first private ACU used to denominate international bond issues. In 1961, a group of European banks under the leadership of the Kredietbank in Luxembourg slightly modified the European Economic Community's official EUA and used it to denominate an international bond issue. In the years since then, the international capital market has witnessed more than sixty bond issues denominated in the private EUA, which thus remains the most durable and successful private ACU to date. The private EUA had the same gold content as the official EUA, but, unlike the latter, the gold value of the private EUA was subject to alteration under certain circumstances. This flexibility could minimize the exchange risk for any party to a bond contract. The underlying principle was that the gold values of the private EUA could be modified only by a change in the par value of *all* seventeen currencies (called the "reference currencies") to which it was linked. The reference currencies were those of the original seventeen members of the European Payments Union, which comprised the six members of the European Economic Community, the seven members of the European Free Trade Association, and Iceland, Greece, Ireland, and Turkey. If the parities of all but one of these currencies changed during a given period, the value of the private EUA remained unchanged, even if there was a change in the par value of the U.S. dollar or in the price of gold in terms of the U.S. dollar.

The absence of a direct link between changes in the private EUA and in the price of gold meant that the bonds denominated in EUAs could not be deemed to include a gold clause; such a clause is generally forbidden in private contracts by law or by judicial decision.² The value of the pri-

² See Nussbaum (1960), pp. 280-299 for domestic contracts, and pp. 414-445 for international contracts.

vate EUA could change only when the following two conditions were met simultaneously: (1) *all* seventeen reference currencies changed their parities; (2) at least two-thirds of them changed their parities in the same direction (devaluation or revaluation).

However, the international currency turmoil that followed the suspension of dollar convertibility into gold rendered cumbersome and obsolete these strict conditions for a change in the private EUA value. Some countries adopted so-called "central rates" as their *de facto* par values, as distinct from *de jure* par values. Since the value of the original private EUA was based on par values and not on central rates, substitution of central rates for par values by some countries made it impractical to modify the value of the private EUA on the basis of changes in par values alone. Furthermore, when some reference currencies floated outright, maintaining neither a central rate nor a par value, it became even more impractical to tie the private EUA to par values.

To surmount this predicament, a *new* private EUA formula was adopted in 1972 by its original designer, the Kredietbank in Luxembourg. The new private EUA formula is designed to reflect the changed international economic and monetary reality, in particular, the movement toward European monetary integration. The new formula incorporates several novel characteristics. In the first place, even though the gold value of the new private EUA remains the same, at 0.88867 gram of fine gold per EUA, this gold link can be severed when gold is superseded by another unit such as the SDR as the common denominator (numeraire) for par values. The new private EUA will then be defined on the basis of this new standard. Furthermore, the "par value" of a reference currency in the new private EUA covers not only the *de jure* "par value" used by the IMF but also the central rate, as defined in a special decision by the IMF's Executive Directors on December 18, 1971.³ If an EUA reference currency were to have both a par value and a central rate in the future, and if a difference were to occur between the two, the central rate would then be regarded as the effective "par value," provided that this central rate were actually supported by the monetary authorities. Some IMF member countries, however, use neither a par value nor a central rate because of the unsettled international monetary situation.

In contrast to the old private EUA, which was linked to the currencies of the seventeen member countries of the EPU, the new private EUA is linked to the currencies of the member countries of the enlarged European Communities. But there are two clearly defined cases in which the

³ "Central Rates and Wider Margins: A Temporary Regime," decision by the IMF Executive Board, Dec. 18, 1971.

currency of an EC member loses its status as a reference currency of the new private EUA: when a reference currency no longer has any par value or central rate, or when the member country no longer respects the narrowed margin of 2.25 per cent specified in the European common-margins arrangement of March 19, 1973 (i.e., declines to keep its currency within the so-called European currency "snake"). Thus, three EC currencies (the Italian lira, the British pound, and the Irish pound) are no longer reference currencies of the EUA, partly because they have neither par values nor central rates and partly because they do not adhere to the European common-margins arrangement (they are floating outside the snake). The practical consequence is that these three currencies are not taken into account in calculations for revising the value of the private EUA.

Since the other six EC currencies have central rates (though not par values) and since they belong to the snake, they are the reference currencies of the new private EUA. However, the value of the new private EUA in terms of these reference currencies is determined at their *fixed* central rates vis-à-vis the SDR rather than their *floating* rates vis-à-vis the SDR, which are calculated on the basis of the standard-basket concept. For example, the central rate of the German mark has been fixed at SDR 1 = DM 3.2198 since June 1973, but the DM-SDR rate on the basis of the standard-basket concept floats daily; on June 12, 1975, one SDR equaled DM 2.9116. Therefore, one EUA, which is equal to one SDR, owing to their legally identical gold contents, equals DM 3.2198 at the central rate, not, say, DM 2.9116 on the standard-basket calculation on June 12, 1975.

The gold value of the new private EUA changes if all reference currencies have changed their par values since the date of issue *and* if a simple majority have changed in one direction; the private EUA will then be adjusted by the smallest percentage change within the majority group. If all reference currencies were to lose their status, the private EUA would be adjusted to the reference currency that was the last to renounce (either *de jure* or *de facto*) its par value.

The new private EUA formula is a definite improvement over the old one in that it reflects more closely the present European reality. Changed circumstances made it appropriate to abandon the link between the private EUA and the currencies of the long-defunct European Payments Union and, instead, to link it to the currencies of the enlarged European Communities. This innovation harmonizes with the desired movement toward economic and monetary union within the Communities. In this

sense, the new private EUA is similar to the European Currency or Monetary Unit, which is explained in the following section.

ECU (or EMU)

In December 1970, the European Currency Unit (ECU), or the European Monetary Unit (EMU), was created on the occasion of the flotation of a bond issue for the European Coal and Steel Community. The value of the EMU was fixed irrevocably in terms of the currencies of the six original EEC members for the duration of the bond issue, which had a fifteen-year maturity. Regardless of what might happen to the relative exchange rates of the six European currencies, one EMU was set immutably at DM 3.66, BF 50, f 3.62, Lit 625, Lux F 50, and F 5.55419. At the time of the bond issue in December 1970, one EMU was equal to one U.S. dollar on the basis of the then-prevailing exchange rates between the dollar and the six EEC currencies. Any subsequent devaluation or revaluation of an EEC currency could not alter the original relationship between the EMU and that currency.

In consequence, an investor in EMU bonds was guaranteed full protection against devaluation as well as the right to benefit from a revaluation of any of the six currencies. For example, if the French franc were to depreciate by 10 per cent vis-à-vis the German mark, French investors in EMU bonds could demand payment in German marks at the fixed rate of EMU 1 = DM 3.66 and convert the mark proceeds into French francs, for an exchange gain of 10 per cent. If the German mark were to appreciate vis-à-vis the other five currencies, all non-German investors could demand payment in marks, to be converted into their domestic currencies at a profit. In general, a holder of EMU bonds would realize exchange gains if his domestic currency was devalued against any of the six currencies or if any of the six was revalued against his domestic currency. A bondholder whose domestic currency was revalued would have no exchange gain or loss. An issuer of EMU bonds would realize no exchange gain when his domestic currency was revalued, but he would suffer an exchange loss when his domestic currency was devalued. In return, an EMU issue had two main advantages for him: considerably greater sums could be raised through it than through other Eurobonds, and the interest rate was usually a fraction lower than that on other Eurobonds. Nevertheless, investors had an undue advantage; they obtained not only full protection against a devaluation but also the right to profit from the revaluation of any of the six currencies. Thus, the exchange-rate risk to which borrowers exposed themselves was the main deterrent to a wider use of EMU bonds.

In fact, the EMU bond was nothing but a multiple-currency bond. The only distinguishing characteristic of the EMU bond was that, instead of the customary two currencies of a multiple-currency bond, it had six—the currencies of the original European Common Market countries. Except for the European Coal and Steel Community and a few other independent agencies that could expect continued revenue inflows in all six currencies, few borrowers could afford the luxury of assuming the exchange risk inherent in a multiple-currency issue with six option currencies. Consequently, the EMU has rarely been used since 1972.

Eurco

By the spring of 1973, it became clear that the Smithsonian Agreement was a failure. All major currencies, including the U.S. dollar, began floating against one another. The absence of a stable currency system struck a heavy blow against the international capital market, where investors became extremely reluctant to purchase long-term bonds denominated in a foreign currency whose value could fluctuate without limit. In order to elicit investors' confidence, the international financial community attempted to develop an artificial currency unit whose value would remain relatively stable. The European Composite Unit (Eurco) was the product of such efforts. It was first introduced in September 1973 by a group of European banks led by a London investment bank, N. M. Rothschild & Sons. The European Investment Bank was the first borrower to float a bond issue in Eurcos. Revolutionary in concept by virtue of introducing the currency-basket idea, the Eurco consists of fixed amounts of the currencies of the nine EC-member countries. The amounts of the nine currencies are fixed irrevocably as follows:

$$\begin{aligned} 1 \text{ Eurco} &= \text{DM } 0.90 + \text{F } 1.20 + \text{£ } 0.075 + \text{Lit } 80 \\ &+ \text{f } 0.35 + \text{BF } 4.50 + \text{DKr } 0.20 + \text{£Ir } 0.005 \\ &+ \text{Lux F } 0.50. \end{aligned}$$

As previously mentioned, the currency-basket concept of the Eurco was subsequently applied to the new SDR in June 1974 and to the new official EUA in March 1975. The European Community's new official EUA is especially close to the Eurco. In fact, their currency baskets are composed of the same nine EC currencies; the only difference between the two is in the currency fractions included in the two baskets, as shown in Table 2.

Even though the currency-basket (or currency-cocktail) concept pioneered by the Eurco has become popular in valuing official ACUs such as the new SDR and new official EUA, the Eurco has not been successful

TABLE 2
CURRENCY FRACTIONS IN THE EURCO AND NEW
OFFICIAL EUA BASKETS

EC Currency	Currency Fractions	
	Eurco	EUA
DM	0.90	0.828
F	1.20	1.15
£	0.075	0.08885
Lit	80.00	109.00
f	0.35	0.286
BF	4.50	3.66
DKr	0.20	0.217
£ Ir	0.005	0.00759
Lux F	0.50	0.14

as a denomination unit for bonds. So far, only three bond issues have been denominated in Eurcos, two for the European Investment Bank and one for a private corporation. The two EIB issues were sold out mainly because the Italian authorities granted special permission to Italian investors to buy the EIB bonds without meeting the usual deposit requirements for capital exports from Italy. The private Eurco bond issue was a dismal failure. The main weakness of the Eurco as a bond-denomination unit is that almost half the Eurco's value is tied to EC currencies of doubtful prospective strength. Investors have shown little interest in purchasing Eurco bonds when there are enough bonds denominated entirely in strong currencies. Thus, it is clear that the Eurco as a numeraire for bond issues is a failure.

Arcru

In the wake of the quadrupling of oil prices in 1973, OPEC countries began accumulating huge surplus revenues. Consequently, the main concern of the international banking community in 1974 was to devise ways to tap the surplus oil revenues of oil-exporting countries, especially those in the Middle East. In November 1974, Hambros Bank in Britain introduced the Arab Currency-Related Unit (Arcru) for a Swedish company that wished to make a private placement with Middle Eastern investors. The Arcru is an artificial currency unit designed to meet the preferences of Arab investors for securities expressed in their own currencies. The Arcru is based on twelve Arab currencies whose strength varies widely, as does the wealth of the national economies they represent. These twelve currencies are the Algerian dinar, Bahrain dinar, Egyptian pound, Iraqi dinar, Kuwaiti dinar, Lebanese pound, Libyan dinar, Oman riyal, Qatar

riyal, Saudi Arabian riyal, Syrian pound, and United Arab Emirates dirham. But the number of component currencies actually used in estimating the value of the Arcru is only eight, because the two strongest and two weakest component currencies, relative to base-date values, are eliminated before making the estimate. On the base date of June 28, 1974—chosen to coincide with the base date of the new SDR—the Arcru had a value of SDR 0.828945, or \$1. From that date on, the value of the Arcru in terms of the U.S. dollar has fluctuated to reflect the average of the subsequent movements in the dollar exchange rates of the middle eight currencies. Unlike the SDR or the Eurco, however, the middle eight currencies used in calculating the value of the Arcru have equal weights, each contributing 12.5 per cent of the value of one Arcru.

The composition of the eight middle currencies will change over time as the relative strengths of the twelve component currencies change vis-à-vis the U.S. dollar, and this tends to stabilize the dollar value of the Arcru. In many practical respects, moreover, the Arcru is little different from the U.S. dollar; all the transactions for an Arcru loan (loan subscriptions as well as interest and principal payments) are effected in U.S. dollars. The only difference between the Arcru and the U.S. dollar on a given date is the divergence of the average dollar value of Arab currencies from the base-date ratio of June 28, 1974, when one Arcru equaled one U.S. dollar. The dollar value of the Arcru is calculated daily, just as the value of the SDR in all major currencies is calculated daily by the IMF and as the value of the Eurco in EC and U.S. currencies is calculated daily by the Luxembourg Stock Exchange. For this purpose, Hambros Bank, in cooperation with several Arab-related banks, has made provision for the regular receipt of the necessary exchange-rate information. The dollar value of one Arcru is calculated in the following way: First, an estimate is made of the percentage changes from the base date in the exchange rates of the twelve component currencies vis-à-vis the U.S. dollar. Next, the two strongest and two weakest currencies are excluded. Finally, the simple average change in the exchange rates of the remaining eight currencies is calculated vis-à-vis the dollar.

The Arcru has two advantages over other composite currency units such as the SDR and the Eurco. The inclusion of only the middle eight currencies out of the twelve eliminates the effects of extreme aberrations, temporary or persistent, in the exchange rate of any one currency. This feature should be attractive to borrowers in particular. Additionally, since the Arcru is based on Arab currencies, it should be attractive to Arab investors who would like to make loans in their own currencies to avoid foreign-exchange risks. Thus, the Arcru appears to provide a happy mid-

dle ground between a non-Arab borrower and Arab investors. Its main shortcoming at this time is a lack of general understanding of the concept it embodies. This shortcoming may recede in the future when a well-known borrower that is likely to be noticed and emulated, such as the European Investment Bank, decides to float an Arcru loan.

B-Unit

The Barclays Unit (B-Unit), created by Barclays Bank International in early 1974, is designed to meet the need for a global currency unit that is suitable for commercial transactions rather than bond issues. The B-Unit is defined in terms of five major currencies—the U.S. dollar, the British pound, the German mark, the French franc, and the Swiss franc. Each currency has an approximately equal weight of 20 per cent in the B-Unit. When the value of a contract in international trade is denominated in B-Units, it will be less susceptible than a single currency to pronounced fluctuations in the event of exchange-rate changes.

The value of one B-Unit in 1974 was tentatively fixed as follows:

$$1 \text{ B-Unit} = \text{£ } 1.00 + \text{DM } 6.00 + \$ 2.40 + \text{F } 11.50 + \text{SwF } 7.00.$$

In view of the substantial exchange-rate changes occurring under the floating-rate regime, the amounts of the individual currencies included in the B-Unit are revised periodically to maintain the principle of approximately equal weights of 20 per cent each. Sometimes, even the composition of the reference currencies and their relative weights are changed to suit the particular need of a corporate client. While it is premature to judge how well the B-Unit will be accepted in international trade, Barclays Bank reports strong initial interest from companies engaged in transport, the purchase of equipment and raw materials, and the conclusion of management contracts.

In conjunction with the B-Unit, Barclays Bank International is also working with a group of other European banks to develop the commercial Eurco, which is also designed for international commercial transactions. The main difference between the Eurco used in bond issues and the commercial Eurco is that, where two-tiered exchange rates exist, the financial exchange rates are used for bond issues and the commercial exchange rates for the commercial Eurco.

IFU

In March 1975, the Crédit Lyonnais in France launched an artificial currency unit called the International Financial Unit (IFU) for use in its international banking operations. The IFU is based on a currency basket

consisting of approximately 58 per cent EC currencies and 42 per cent non-EC currencies. The IFU is similar in concept to other currency-basket ACUs such as the new SDR, the new official EUA, and the Eurco. The only difference is that the IFU basket has ten component currencies, compared with nine component currencies in the official EUA and the Eurco and sixteen component currencies in the SDR. The relative weights of the IFU's component currencies are based on the international trade of the ten countries over the 1969-73 period. By converting the relative weights into various currency fractions at the market exchange rates prevailing on the base date of April 1, 1974, the currency composition of one IFU has been set irrevocably as follows:

$$\begin{aligned}
 1 \text{ IFU} = & \$ 0.210 + \text{DM } 0.432 + \text{£ } 0.044 + \text{F } 0.477 + \text{¥ } 27.900 \\
 & + \text{Can\$ } 0.073 + \text{Lit } 46.700 + \text{f } 0.188 + \text{BF } 2.350 \\
 & + \text{SKr } 0.154.
 \end{aligned}$$

Even though the value of the IFU is tied to ten currencies, the U.S. dollar is designated as the actual payments currency. Thus, both subscriptions to an IFU bond issue and payments of the principal and interest will be made in U.S. dollars. One advantage of the IFU over the Eurco and the official EUA is that the former consists of both EC and major non-EC currencies, while the latter are composed of EC currencies alone. The broader currency base of the IFU may attract a wider spectrum of international investors than Eurco or EUA bonds. About half the component currencies of the IFU are strong currencies and half weak. This mixed currency composition of the IFU may overcome the main drawback of such EC-currency-based ACUs as the Eurco and the official EUA, most of whose component currencies are either weak currencies or currencies of small countries. Thus far, no Eurobond issue has been denominated in IFUs. Were such an issue to occur, the Luxembourg Stock Exchange would post daily the dollar value of the IFU.

ACUs and Functional Currency Areas

The breakdown of the Bretton Woods system and the ensuing widespread adoption of floating exchange rates in recent years do not necessarily spell the doom of the fixed-exchange-rate system. What we are currently witnessing is a floating-rate regime for major currencies on a global basis, accompanied by a fixed-rate arrangement for nonmajor currencies in terms of a particular major currency on a regional basis. This arrangement is a shaky one, however, because a quest is emerging for a stable relationship among major currencies so as to average out exchange

risks, not just a stable relationship between a major currency and its satellite nonmajor currencies. The latter connection may be regarded as a currency bloc. Its principal shortcoming is that the individual currencies of the bloc are highly dependent upon the domestic economic and political policies of the major-currency country. Moreover, a sizable volume of international commercial and financial transactions takes place between countries belonging to different currency blocs: these transactions would be facilitated by a substantial degree of interbloc currency stability that is not now obtainable.

Here, then, enter the ACUs to perform the essential function of imparting stability to interbloc currency relations. In equilibrium, the exchange rate between two currencies is determined by supply and demand for goods and assets between the two countries. The ACUs do not affect this equilibrium exchange rate, the achievement of which requires appropriate adjustment policies by the two countries concerned. However, the ACUs need not affect the equilibrium rate in order to impart interbloc currency stability. In any case, exchange-rate fluctuations arise in large part not from daily changes in the equilibrium rate but from speculative exchange trading in the broadest meaning of "speculation." Speculative trading may occur for a myriad of motives ranging from pure greed and market manipulations to straightforward attempts to minimize perceived future exchange losses. In general, the higher the perceived risk of exchange losses, the more pronounced will be the exchange-rate fluctuations. It does not matter whether the high risk is due to lack of information or to the absence of a proper mechanism to insure against the risk: if the risk is somehow reduced, exchange trading will be more orderly and, consequently, currency fluctuations will be reduced. The ACUs reduce the risk of exchange losses in interbloc transactions by offering a mechanism to average out pronounced exchange gains or losses, thereby lessening incentive to speculative trading and contributing to interbloc currency stability.

The coverage of ACUs is usually wider than that of a currency bloc. The currency baskets of the Eurco or the official EUA include not only the currencies of a European currency bloc represented in the European snake but also other major EC currencies such as the British pound and the Italian lira. Other ACUs, such as the SDR, the AMU, and the IFU, provide even wider interbloc currency stability by including in their baskets almost all the major currencies of the world that are floating vis-à-vis one another in foreign-exchange markets. By providing a relatively stable unit of account for interbloc transactions, the ACUs help to establish various optimum currency areas in the functional sense.

One proposal for international monetary reform that has been advocated recurrently since the early 1960s is the establishment of currency areas comprising several countries. Between such areas, exchange rates would be freely variable; within each area, exchange rates would be irrevocably fixed. This policy-oriented proposal is associated with theoretical innovations in international monetary economics that pertain to the identification and analysis of "optimum currency areas." (For a recent account of the literature, see Ishiyama, 1975.) The theory of optimum currency areas has been primarily concerned with delineating a geographical area within which exchange rates can be fixed immutably. The critical issue in the development of this line of thought is the question of what constitutes the optimum coverage of a currency area. As the first to respond to this question, Mundell (1961), in classical fashion, pointed to factor mobility as the crucial consideration. An optimum currency area, in his view, is a region within which the factors of production are mobile, while factors are immobile between different optimum currency areas. Accordingly, exchange-rate variability between currency areas substitutes for the degree of freedom that is provided by factor mobility within a currency area. In consequence, the region within which exchange rates should be fixed or a single currency used may sometimes be larger than one country, as prospectively (or hopefully) in the European Community, and sometimes smaller than one country, as in the Appalachian region of the United States. Although Mundell recognized the economy and convenience of a common currency, he argued against enduring unemployment as a means of adjusting interregional financial imbalances when the exchange rate is fixed and factor mobility is limited.

A different conception of optimality was suggested by McKinnon (1963). Rather than focusing upon factor mobility, McKinnon found the essence of the optimum currency area in the predominance of internal transactions within the area as compared with a modest volume of external transactions with the rest of the world. Accordingly, the thrust of his norm for optimality was to expand currency areas, as, for example, to combine the U.S.-dollar and Canadian-dollar territories into a unified currency area.

Kindleberger (1973) provided a third conception of optimality in currency-area formation, diverging fundamentally from both the foregoing contributions. Mundell's and McKinnon's criteria for optimality were essentially economic, although pointing in somewhat different directions—Mundell at times to areas smaller than a single country, McKinnon generally to larger units. Kindleberger's criterion is political: the essence of a currency area is the coherence of its major economic policies; thus

the optimum currency area is the nation-state. On the one hand, regions within a country lack the independent authority for policy formation in various fields; on the other hand, groups of separate countries may seek cooperation among themselves, but the problem of mutual sovereignty inevitably recurs in their interrelations.

We put forward here a fourth conception of the optimum currency area. We argue that the criterion of optimality in currency-area formation is the functional aspect of the specific transaction for which a currency is to be used. Accordingly, different types of international transactions may give rise to different functional currency areas that can optimally be served by the specific ACU designed for those types of transactions. We designate this new kind of currency area a "functional currency area." The concept of currency area in this case is admittedly quite different from the conventional definition, where it is crucial to obtain fixed parities between intra-area currencies in order to arrive at essentially one currency for the region. In functional currency areas, however, two kinds of currencies coexist: the inside (or national) currencies for domestic transactions and the outside (or international) currencies in the form of ACUs for intercountry transactions.

The conventional theories of optimum currency areas are primarily concerned with determining the area over which a single currency can serve intra-area transactions most economically, without concern as to how inter-area transactions should be effected. In contrast, our theory of functional currency areas, following Kindleberger's notion of optimum currency areas, tacitly accepts the nation-state as the optimum currency area for intra-area (i.e., domestic) transactions. But our theory goes one step further by considering also the optimum currency areas for particular types of inter-area (i.e., international) transactions. These areas are formed by introducing various ACUs tailored to particular types of transactions. In this sense, ACUs help form functional optimum currency areas, free of geographical constraints, for different sets of international transactions. The emergence of ACUs permits the separation of domestic money for intra-country transactions from ACUs for international transactions.

It may still be suggested that our description of functional currency areas merely involves a different *definition* of the term "currency area" rather than a different notion of optimality. Yet if a growing volume of transactions is denominated in an outside currency, a criterion emerges for judging that the currency area is suboptimum. This criterion constitutes the basis of our concept of functional currency areas. The actual development of various ACUs demonstrates that functional currency

areas can vary in size depending upon the function for which an ACU is designed. For example, a functional currency area for the purpose of long-term bond investments may not be coterminous with that for commercial transactions. A variety of ACUs can cope with this functional variability of currency areas. Thus, the B-Unit is designed primarily for commercial transactions among Western industrial traders, while the Arcru is aimed at long-term bond investments by Arab investors. The private EUA is attractive mostly to European investors, while the IFU is designed for a worldwide investment clientele. For the purpose of regional payments settlements, the official EUA of the European Communities and the AMU of the Asian Clearing Union may be sufficient. In contrast, a global clearing mechanism may require the SDR or an even broader-based ACU. In this manner, each ACU can serve a specific purpose in a functional optimum currency area.

A theory of functional currency areas can explain the practice of pluralistic currency utilization. The growing internationalization of economic institutions in many countries makes it imperative to adopt a multicurrency concept for those institutions' global operations. Assets and liabilities of multinational corporations or international banks can no longer be denominated in a single optimum currency. Increasingly, international transactions, either financial or commercial, will be executed in the ACU most functionally suitable for that transaction. Multinational institutions have discovered that the use of a key national currency is patently inadequate for their international operations, which require new types of global currencies. Mundell (1973, p. 151) observes that there is an inherent tendency for a common international money to develop based on economies of scale in the production of information. The emergence of ACUs can be viewed as a practical response to this new institutional demand for a dual currency system, where national currencies are used mostly in *intra*-country transactions, while ACUs are used for *international* transactions.

The rise and proliferation of artificial currency units that we have reviewed in these pages illustrate the pervasiveness, spontaneity, and diversity of the recourse to the formation of functional currency areas. In a fundamental sense, the reference to "artificiality" in ACUs is a misnomer: the voluntary, profit-oriented cooperation that characterizes the establishment of private ACUs may just as readily be regarded as a "natural" outgrowth of international monetary practice. In any event, the development of both official and private ACUs indicates that compulsory (i.e., intergovernmental) as well as voluntary (i.e., private) cooperative ventures may further propagate the ACU phenomenon. Whether this phenomenon represents "the wave of the future" in international mone-

tary economics we do not hazard to predict. Suffice it to note that for the duration of the regime of floating exchange rates among national currencies, the development and use of ACUs is likely to continue.

In this connection, we recall Kindleberger's (1973) admonition against the regional-bloc approach to the establishment of optimum currency areas (as in McKinnon's conception). To Kindleberger, the objectionable implication is that in each bloc there would be a dominant power or powers that the other members would follow. In his view, the political hypothesis on which this proposal rests has it exactly backward. He regards it as desirable (1) to have fixed exchange rates among the major blocs in order to impart coherence to major economic policies worldwide, and (2) to give smaller powers the freedom to exercise their own choice of macroeconomic policies according to their own wishes and capacities. As he notes:

It is relatively unimportant to the world that Canada has a fluctuating dollar with which it can, if it desires, reduce its integration with the United States. What is important is to keep alternative markets open for the smaller and developing powers, as those like Australia, New Zealand, Japan and Israel that do not easily fit into a bloc (p. 431).

We find Kindleberger's widely shared aversion to breaking the world into geographic blocs far more consistent with our concept of functional currency areas than with the orthodox currency-bloc notions of the 1960s. The functional-currency-area approach allows for flexibility and variability of scope in the composition and size of international groupings for the purpose of adopting a currency unit. It is an antidote to the rigid geographical delineation of currency blocs.

Likewise, the functional-currency-area approach can diminish the concern of developing countries over the choice of a key currency to which to link. U Tun Wai (1975, p. 30) has noted that a developing country is faced with a troublesome dilemma. If it links its currency to the strongest key currency, it will be afflicted with an overvalued currency. If it links its currency to a weak key currency, it may find its foreign assets shrinking in value in terms of other key currencies. The functional-currency-area approach provides a way out of this dilemma by offering alternative ACUs to any one of which a developing country can link its currency; presumably, developing countries in particular would be averse to entanglement in rigid currency blocs. The functional-currency-area approach may not be the *optimum optimum*, but it may approximate the application of the theory of the second best.

What, then, is the lesson of ACUs for the pursuit of international monetary reform? Perhaps much of the current agenda for monetary reform is

cast within too narrow a framework; the reform debate tends to focus on such traditional topics as demonetization of gold, restoration of the fixed-rate system, and convertibility of currencies. The emergence and prospective wider use of ACUs may make the future monetary system more pluralistic. Accordingly, concern about a new monetary system can no longer be confined to the issues that arise in the context of national currencies alone. The agenda for monetary reform must be broadened to consider the new issues raised by the emergence of ACUs. The versatile response of official and private institutions to international monetary instability has led to the creation of various ACUs, with complex implications for the international monetary system. It will be quite a challenge for economists to fathom these new monetary developments and innovations so as to make possible a viable reform of the international monetary system.

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TABLE OF CURRENCY SYMBOLS

<i>Country</i>	<i>Name</i>	<i>Symbol</i>
Australia	dollar	\$A
Austria	schilling	S
Belgium	franc	BF
Canada	dollar	Can\$
Denmark	krone	DKr
France	franc	F
Germany	Deutsche mark	DM
Ireland	pound	£ Ir
Italy	lira	Lit
Japan	yen	¥
Luxembourg	franc	Lux F
Netherlands	guilder	f
Norway	krone	NKr
South Africa	rand	R
Spain	peseta	Pta
Sweden	krona	SKr
Switzerland	franc	SwF
United Kingdom	pound	£
United States	dollar	\$

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