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**by Rainer S. Masera**

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## An increasing role for the ECU: a character in search of a script

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*The series "Temi di discussione" intends to promote the circulation of preliminary drafts of papers prepared by the staff of the Banca d'Italia or presented by visiting economists at seminars held in the Bank, in order to stimulate critical comments and suggestions.*

*The papers in the series only reflect the views of the authors and not necessarily those of the Banca d'Italia.*

## SUMMARY AND ACKNOWLEDGEMENTS

This paper starts by reviewing the development of the ECU in the official field and in private markets (Sections 2 and 3). The various factors which help explain the growing use of the private ECU are then considered; in particular "efficient portfolio" analysis shows the desirable properties of the European currency unit. In section 5 the paper examines the two main ways under consideration to give the ECU a truly central rôle in the EMS, namely to develop it into (i) a fully-fledged international reserve asset and (ii) a European currency functioning in parallel with domestic currencies. It is argued (Section 6) that the two schemes should be viewed as complementary. In particular, ECUs in the official and in the private sectors should be made interchangeable to allow use of official ECUs for exchange market interventions; following an approach originally suggested by P. Kenen for the SDR, this could be achieved if central banks were able to exchange their official ECUs with commercial banks, which would simultaneously redeposit them with the BIS. This international monetary institution, which would act as a clearing house for commercial banks, is already empowered to hold official ECU balances. The counterpart of an expanding use of the official ECU along these lines would be its increasing rôle as a substitute for domestic currency borrowing and lending, leading to its use as a parallel common currency. This process - it is argued in Section 7 - would have to be monitored in order to prevent problems of money and credit control.

This paper is an offshoot of ongoing work on the rôle and prospects of the ECU conducted by the Committee of Alternates of the EEC Central Banks, under mandate of the Governors. However, the views expressed here are the author's alone and do not represent the official views of the Banca d'Italia. The author wishes to acknowledge the benefit of the discussions held in the Committee of Alternates, under the Chairmanship of Dr. A. Szasz in 1985 and of Mr. A. Loehnis in 1986. The work of the Alternates could count on excellent ad hoc reports prepared by the two groups of foreign exchange and monetary experts chaired, respectively, by Mr. H. Dalgaard and by Mr. R. Raymond. The author has also benefited from the exchange of views with many colleagues at the Banca d'Italia, in particular E. Barone, G. Falchi, S. Rebecchini and A. Rinaldi. A preliminary version of this paper was presented at the "Conference on the ECU Market: current developments and future prospects", New York University, January 30-31, 1986. I have greatly benefited from the comments of the discussant, Dr. A. Sommariva. As always, the responsibility for any remaining errors is solely my own.

## I. Introduction

It is difficult not to begin a paper on the growing use and future prospects of the European Currency Unit by placing the ECU in the perspective of the European Monetary System. In the resolution of the European Council of 5 December 1978 establishing the EMS, the purpose of the scheme was the "creation of closer monetary co-operation leading to a zone of monetary stability in Europe".

It was also stated that the ECU would be at the centre of the EMS; in particular it would be used:

(i) as a denominator for the exchange rate mechanism;

(ii) as the basis to detect divergences between Community currencies;

(iii) as the denominator for operations in the intervention and the credit mechanism;

(iv) as a means of settlement between monetary authorities of the European Community: to serve this purpose a stock of ECUs was created through revolving swap arrangements whereby participating central banks maintain deposits of 20 per cent of gold and dollar reserves with the European Monetary Co-operation Fund (EMCF).[1/]

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1/ Texts Concerning the European Monetary System, Committee of Governors of the central banks of the member states of the European Economic Community and European Monetary Cooperation Fund, December 1985 (hereinafter Texts), pp. 13 ff.

The Brussels resolution was in fact a compromise solution between two models of the EMS examined in the technical discussions preceding the setting up of the system. According to one, the ECU would also represent a parameter in terms of which central rates and intervention obligations around prescribed margins would be defined. In this scheme, generally only one currency at a time would have reached the prescribed margin. The second model was based on the workings of the "snake" and relied on bilateral central and intervention rates.

The second approach was adopted, with, as a compromise, the introduction of the divergence indicator, which would single out the deviating currency upon which the burden of adjustment would primarily fall.[2/]

In spite of the considerable technical ingenuity put into its construction, the working of the divergence indicator gradually lost importance, partly as a result of increased reliance on unilateral interventions before compulsory margins were reached. The system has therefore de facto evolved in the direction of the second model but with a declining importance of interventions at the obligatory points defined by the fluctuation margins around bilateral central exchange rates. From a formal point of view, devaluations and revaluations are still arranged in terms of ECUs, but this has no economic significance. It is indeed impossible to define ex ante all central rates in terms of ECUs.

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2/ For an analysis of these points see The EEC Monetary Committee, Interim Report on the EMS (1978), R. S. Masera and S. Rossi (1981), P. Ludlow (1982, esp. 6.2).

## II. A brief overview of developments of the "official" ECU

It would be wrong to infer from the above that the rôle of the official ECU has been of little significance. Admittedly, it was confined to its function as an official reserve asset and as a means of very short-term financing (VSTF) and settlement. Even in this respect its rôle was somewhat limited: largely because in the EMS experience dollar interventions prevailed (two-thirds of total interventions), while marginal interventions amounted to some 10 per cent (see Table 1).[3/]

For reasons which will shortly become apparent, I want to draw attention to the fact that, since the realignment in March 1983, the recourse to interventions at the margin and to the VSTF arrangement has become exceptional. Before attempting an explanation, I think a distinction should be drawn between two types of interventions in Community currencies:

(i) those which entail simultaneously opposite effects on the domestic monetary base of both the country which causes the intervention and the country whose currency is being used. I will call them "symmetric monetary-base interventions". Interventions at the margin which entail recourse to the VSTF mechanism or spot settlements in official ECUs have this property and imply, unless sterilized, a contraction of the monetary base in the weak currency and an expansion in the strong one;

(ii) a second type of intervention is that undertaken by one central bank using Eurocurrency or domestic private

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3/ For a detailed analysis of these developments see Micossi (1985).

banking assets in the other currency. In this second case, except for the absorption (release) of required reserves on domestic deposits subject to reserve obligations, it is only on the initiating central bank that monetary base repercussions of interventions fall. I will therefore call them "asymmetric monetary-base interventions".

Since the realignment in March 1983, the desire of all central banks to avoid the tensions necessarily inherent in reaching bilateral margins has pointed to the opportuneness of preventive intramarginal interventions. This has led some central banks to suggest that it would be desirable to extend the use of the VSTF to finance intramarginal interventions. Any such automatic extension was, however, firmly resisted by strong-currency central banks. It is my conviction that this reluctance is primarily due to the desire to maintain control of domestic monetary policy, which would otherwise be impaired by "symmetric" monetary base interventions, as explained above.

These contrasting preferences led to a compromise solution: i.e. a mobilization clause for ECUs among central banks was introduced as part of a more general package adopted in 1985 and designed to improve the usability of the official ECU. In view of the potential relevance of these measures for the expansion of the ECU in the private markets, I will recap on them briefly, but fully.[4/]

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4/ For greater details see Texts, Instrument of 10th June 1985.

1. The mobilization mechanism introduced enabled EEC central banks with a need for intervention currencies to mobilize their net creditor positions in ECUs through the EMCF, together with part of those ECUs which were allocated to them by the EMCF against the deposit of 20 per cent of their gold and dollar holdings. The EEC central banks have committed themselves to cover such mobilization operations by providing dollars in proportion with and up to ceilings corresponding to their outstanding ECU/US dollar swaps with the EMCF. The dollars thus provided may be exchanged for EEC currencies with the approval of the central banks issuing the currencies concerned. Mobilization operations run three months, renewable for a further three-month period and bear interest at market rates. In exceptional circumstances, a central bank may opt out entirely or in part from participation in such operations.[5/]

2. The payments ratio which limits settlements in official ECUs of obligations arising out of the use of VSTF has remained at 50 per cent as a general rule, but this limit can now be waived if and to the extent that the recipient central bank is itself a net debtor in ECUs.

3. Remuneration of net positions in ECUs and of ECU-denominated claims under the VSTF facility has been improved: the interest rate (previously the weighted average of the official discount rates of the Member states) is now a weighted average of representative money-market rates in Member countries.

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5/ The first activation of the mobilization scheme took place in December 1985, at the request of the Banca d'Italia.

4. Central banks of non-member countries and international monetary institutions such as the Bank for International Settlements which are accorded the status of "Other Holder" by the EMCF Board may obtain official ECUs from EEC central banks by means of sale and repurchase agreements or reversible swap transactions. Other Holders are entitled to the same remuneration on their ECU holdings as EEC central banks receive on their net ECU positions.

## III. The rapid development of the private ECU.

The European Currency Unit in its present basket definition existed before the inception of the EMS, as the European Unit of Account, introduced in the Community in March 1975 and already used in private financial markets as an indexation device for credit contracts.[6/]

The substantial growth of the ECU in these markets happened only after the EMS was created. I will give only a brief review of recent developments, largely because excellent documents are already available [7/], and concentrate on what I regard as key features of this expansion.

Recently, the ECU market has shown remarkable growth both in terms of credit and of exchange transactions. The ECU banking market has grown very significantly, compared with other currency sectors of the

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6/ Texts, pp. 73-75.

7/ See for instance, BIS Annual Report 1984-85, pp. 127-133 and P. Reynolds Allen (1985).

international banking market, especially in the past three years. It now ranks fifth, with a share of more than 3 per cent (see Table 2). The expansion was mainly the result of borrowing by non-bank residents in Italy and France, who, on the assumption of exchange rate stability within the EMS, were attracted by the lower interest cost of ECU borrowing (see Table 3). On the deposit side, funds traditionally came primarily from Belgium and Luxembourg. It is worth noting, however, that in 1985 Dutch residents played a major rôle as suppliers of funds - an important development since it refutes the argument that the ECU cannot be attractive to residents in strong-currency countries. Expectations of exchange stability which probably led Italian and French operators to borrow in ECUs should indeed have induced Dutch or German residents to lend in ECUs.[8/]

To put the expansion of the ECU market into perspective a comparison should also be drawn between EEC non-bank ECU-denominated assets and liabilities vis-à-vis banks and overall supply and recourse to domestic and international credit markets. Results show that, in spite of their recent very rapid growth, ECU loans and deposits still represent only a small share of existing stocks of liabilities and assets: 0.7 and 0.2 per cent respectively (see Table 4).

In all EEC countries, with the notable exception of Germany, the ECU is treated - de jure or de facto - as a foreign currency. As such, ECU transactions are allowed, subject to foreign exchange restrictions. Such restrictions exist in particular in Denmark, France, Greece, Ireland

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8/ Market operators also point to the fact that, barring circumstances when a realignement is anticipated in the short term, certain categories of savers in "strong" currency countries show a preference for higher nominal yields then those available on domestic currencies.

and Italy and are aimed at preventing capital outflows: they impede de facto the creation of ECU deposits by residents. In the case of Germany, Article 3, sentence 2 of the Currency Act prohibits residents from entering into indexed debts, unless explicitly authorized by the Bundesbank. Since the ECU is not treated as a foreign currency but merely as a unit of account, it falls under the provision of sentence 2.[9/] Accordingly, German

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9/ The Currency Act was enacted in the Federal Republic of Germany in 1948 in the context of the currency reform by the occupying powers with a view to establishing and guaranteeing the DM's monopoly as legal tender. Under the Currency Act, residents have to obtain authorization if they wish to use currencies other than the DM: Article 3 states that "Money debts may be contracted in a currency other than the DM only with the permission of the competent foreign exchange control agency. The same rule applies to money debts whose amount in DM is to be fixed in terms of the exchange rate for some other currency, or by the price or quantity of fine gold or other goods or performances". Responsibility for issuing such authorizations lies with the Bundesbank. In 1961, upon introduction of the Foreign Trade and Payments Act, residents were allowed to enter into foreign currency commitments with non-residents. In that year, the Bundesbank issued a general authorization whereby foreign currency commitments between residents were also allowed. This general authorization is not applied to the ECU, since the ECU is not viewed as a currency but as a unit of account. As such, it falls under principles governing the authorization of indexation clauses. Over the years, in the interest of a stability-oriented monetary policy, the Bundesbank Central Council has treated such authorizations very restrictively, in particular it has always avoided giving authorizations of this sort in the field of money or capital transactions. The main objections commonly raised by the Bundesbank to declaring the ECU to be a currency or to placing it on an equal footing with a currency are as follows: (i) the ECU is not backed by any independent monetary authority responsible for its internal and external value; (ii) there is no guarantee of the ECU's continuity of value as long as changes in the weights in the basket can be decided upon by the competent authority; (iii) there is no institution and/or arrangement ensuring ready convertibility of the ECU into reserve currencies; (iv) there is no clear way to establish a rôle for the ECU as an intervention currency. A strict line on these points is reported by Wahlig (1985). A somewhat more open line is, however, held by Pöhl (1985). For the opposite view, and the legal arguments supporting it, see Harland (1986) and Carbonetti (1986). On these points see also below pp. 33-35.

banks cannot issue ECU deposits to residents and German residents cannot build up ECU liabilities. However, since capital movements are free in Germany, German citizens may acquire ECU deposits with banks not domiciled in that country.

Largely in view of these institutional factors, the ECU market continues to be characterized by a predominance of non-bank borrowers; the banking system thus covers itself by borrowing directly the corresponding basket currencies.10/

These factors and the complex web of borrowing and lending which links final savers and ultimate takers of funds help explain the relatively high importance of interbank transactions. Interbank claims and liabilities in other currency sectors of the international banking market correspond to some 70 per cent of overall claims and liabilities. The figures in the case of the ECU are 75 and 87 per cent on the assets and the liabilities side respectively.

The ECU bond market now ranks fifth among currencies in external bond offerings. Especially in the case of Italy, issues in ECUs to residents have acquired significant proportions; since the issues targeted to residents and non-residents are to some extent interchangeable, because non-residents can buy up stocks sold to residents, the total figures on ECU issues are by no means negligible by international standards (see Tables 5 and 6).

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10/ The perception of many market operators is that the imbalance is progressively narrowing, not only because of central bank deposits (see below p. 11), but also as a result of the issue of new instruments - such as deposit certificates - to raise funds from non-banks directly in ECUs.

Examination of the geographical structure of the market indicates that Italy, France and the EEC institutions have been the largest borrowers. A novel feature of the past two years is the increasing interest by non-EEC countries and institutions, and notably by operators based in the United States and Japan.[11/] In 1982, 94 per cent of the total issue of ECU 1.9 billion was accounted for by EEC borrowers; in 1985, the share declined to 64 per cent out of a total issue of ECU 12.2 billion.

The ECU exchange market has also expanded significantly. The aggregate daily turnover in the EEC countries can be roughly estimated at ECU 2.5 to 3 billion. Of this, ECU 0.8 - 1 are accounted for by Belgium and the U.K. and 0.5 billion by Italy. Turnover in Denmark, France, the Netherlands is between ECU 0.2 and 0.4 billion.

In all countries, with the exception of Italy, interbank transactions are more important than trade-related transactions. As a result of its growth, the ECU exchange market is now characterized by spreads between buying and selling rates vis-à-vis EEC currencies which, on average, are not too distant from those recorded by the same currencies vis-à-vis the dollar (see Table 7).

The ECU is now quoted officially in Amsterdam, Athens, Brussels, Copenhagen, Lisbon, Milan, Oslo, Paris and Rome. Forward markets are limited, however. Future contracts in ECUs have been launched in New York and Chicago, and options have been recently introduced (See ECU Newsletter).

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11/ While Japanese borrowers are tapping the market for genuine diversification purposes, it appears that prime US borrowers have mainly been attracted to the ECU market to benefit from the marginally lower cost they enjoy compared with European takers. The ECU funds raised would then often be swapped against dollars with European borrowers.

A potentially important development for the ECU exchange market has been the involvement of some EMS central banks (see Table 8). Before 1985 interventions in private ECUs ( i.e. purchases or sales of ECUs against domestic currencies) were prompted by the desire to maintain orderly conditions in the ECU market. Last year, instead, interventions were in some instances also aimed at stabilizing the domestic currency; total interventions amounted to some ECU 2.4 billion on a gross basis, the bulk of which was accounted for by the Bank of Italy.

In December 1985 net holdings of private ECUs by EEC central banks amounted to 1.7 billion, i.e. 2 per cent of foreign exchange holdings (see Table 8). One-third of these reserves were held by the Bank of Italy and they accounted for 5 per cent of Italy's total foreign exchange reserves. The structural imbalance between final borrowers and final lenders in the ECU market is thus partly offset by central bank deposits.

We note that private ECU interventions have "asymmetric" monetary base properties, contrary to interventions which use official ECUs. It must also be observed that, since a purchase (sale) of ECUs is also a purchase (sale) of the domestic currency, to the extent of the weight of the currency in the basket, ECU interventions must be larger in size than other interventions to achieve the same exchange rate effect.

## IV. Determinants of the growth of the private ECU market

A number of arguments have been advanced to explain the growing use of the ECU by private operators.

In my view, the primary factors - which acted in a synergic way - must however be sought in (i) the inherent basket properties of the

ECU; (ii) the effects of the exchange rate and economic policy commitments undertaken by the countries participating in the exchange rate mechanism; (iii) the general process of financial innovation.[12/]

For a large number of European operators the ECU's total yield - exchange rate plus own interest - reduces exposure in international asset and liability management: at the same time the ready-made basket provides for a reduction in transactions costs compared with to transacting individually tailored currency cocktails.

We note in these respects that, since the inception of the system, traditionally weak currencies participating in the Exchange Rate Agreements have, by higher nominal yields, generally more than offset the depreciation of the currency. Thus, especially in the period between March 1983 and July 1985, importers and exporters in Italy and France were attracted to the ECU as an instrument for international borrowing, because of the relative low straight interest rate and the limited anticipated appreciation against the domestic currency. On the other hand, savers in the Benelux countries were enticed to ECU loans because of the relatively high yield, when the direct acquisition of high-interest currencies would have entailed greater exchange rate risk. Moreover, portfolio diversification considerations favoured the acquisition of ECU bonds by residents in France and in Italy where this acted as a partial substitute for purchases of assets in foreign currencies which were discouraged by foreign exchange restrictions.

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12/ This third point was made by Pöhl (1985) and convincingly developed by Levich (1986).

In conclusion, even though it is partly true, the argument that the development of the private ECU owes much to uncertainty about exchange rates and interest rates in the Community - which is the direct consequence of the unsatisfactory progress in monetary integration - should not be overrated. It is no coincidence that the period of relative stability in exchange rates in the past three years has been the one which showed the most significant expansion in the market.

If the explanation for the growth of the private ECU market is cast primarily in terms of the role of the ECU in a rational portfolio strategy for the European resident engaged in international financial transactions, the question becomes amenable to empirical analysis in terms of efficient portfolio choice.[13/]

First, the usual mean-variability model can be used to assess the relative attractiveness of the various currencies. In this approach, a meaningful comparison can only be made sequentially, by taking each currency in turn as the "domestic" currency and comparing foreign currencies among themselves, viewed as mutually exclusive options. Variability of the domestic currency against itself is given only by the variability of the interest component of the overall yield. In a world of managed floating exchange rates this is typically much lower than the total variability.

The analysis in this paper covers the entire experience during the period of floating: March 1973-December 1985. Two subperiods are also considered, from March 1973 to March 1979 and the period of existence of

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13/ Important technical contributions along these lines are given by Hamaui (1985) and Jorion (1986). As Ciampi explained (1981), the fixed-quantities definition of the official ECU was indeed chosen to allow private operators to replicate the official basket, thereby fostering private use of the ECU and exploiting its portfolio properties.

the EMS. In order to extend the analysis to the entire period, the present ECU definition is carried backwards. In addition to the ECU and all its component currencies, the paper also considers the U.S. dollar, the Japanese yen and the SDR basket in its 1985 definition.

Average data for interest rates, exchange rate variations and total returns are computed on a quarterly basis; interest rates refer to three-month domestic money market instruments.

Over the entire period of floating, the DM, the dollar and the yen showed approximately the same return. As to currency baskets, the SDR performed better than the ECU (see Chart 1), the result of two long waves of the dollar, with a low tide in the first half of the period and a high tide in the second half; the latter period is broadly coincident with the EMS experience (see Chart 2). The two long waves are broken by strong cross currents: specifically, the phase of dollar appreciation came to an end in February 1985 and a significant decline took place thereafter.

These developments are summarized in quantitative terms in Tables 9a and 9b, which report both the interest rate and the exchange rate components. They also show the standard deviation of recorded returns.

If we concentrate our attention on reward-to-variability ratios and to the period of operation of the EMS, some interesting features emerge. First, taking in turn as the "base" currency the DM, the French franc and the Italian lira, the ECU represents the "best" investment opportunity. In the case of the Dutch guilder, the ECU is "second best", closely following the DM (see Table 9b).

For the U.K. investor, on the other hand, the most satisfactory choice - always on the basis of the reward-to-variability ratio - is the SDR. This is also true for the American investor. However, it shows up as a

very poor choice for all investors whose currencies participate in the EMS Exchange Rate Agreements.

A more satisfactory analysis of international financial portfolios can be obtained by allowing for the covariance among alternative returns.[14/] The standard Markowitz (1952,1959) model can be used to determine the weights of currencies in "efficient" portfolios, with the view to minimizing the overall variance for a given expected return. In this case too the exercise is done sequentially, taking in turn each currency as the domestic currency, and considering all other currencies as elements of the "foreign" portfolio. The parts of the portfolio invested in foreign short-term assets are constrained to be positive.[15/] This rules out short sales. The viewpoint adopted is that of an investor rather than that of a borrower (negative weights) or an arbitrageur (negative or positive weights). Consequently, lending rates rather than borrowing rates have been considered. The absence of constraints on the signs of the weights would necessarily have entailed assuming equal lending and borrowing rates and an unbounded objective function (that is, unbounded theoretical profits) with very large offsetting positions in highly correlated currencies. In turn, this would often have led to empirical results of little economic significance.

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14/ The relevant references on multicurrency portfolio selection problems are: Solnik (1973, 1974), Sarnat and Szego (1979), Szego (1980), Levy (1981), Levy and Sarnat (1983), Adler and Dumas (1983).

15/ An unconstrained approach is followed instead by Hamaui (1985) and Jorion (1986).

The simulations for the period of operation of the EMS - March 1979 to December 1985 - of efficient portfolios for investors in different countries show again that the ECU represents a good investment for European residents. It appears, in combination with other currencies, in the efficient portfolio frontier for all EMS investors (see Table 10b). Moreover, it also lies close to the frontier as a low risk asset (see Charts 3 and 4). This is true both for residents in strong-currency and in weak-currency countries. Its special attractiveness for risk-averse operators is witnessed by the fact that it is always present with significant weights in minimum variance portfolios. The weights vary from 0.98 in the case of the French investor to 0.24 in the case of the German one. A combination of ECUs (0.77) and SDRs (0.23) is the efficient least-variance portfolio for U.K. residents.

Let me also observe here that, when the dollar and the yen are taken as base currencies, the portfolio analysis points to the desirable properties of the SDR, which performs a similar rôle to that of the ECU for the European investor. In turn, these results suggest that there is something to the "infant currency" argument. Without (i) the active initial support of the EEC Commission and of some European countries and (ii) the use of the official ECU, it might have been difficult to reach the threshold beyond which the ECU could assert itself in the markets. Now that the private ECU market exists, substantial benefits can be reaped from the significant reduction in transaction costs, compared to individually tailored baskets and the SDR itself.

## V. An assessment of the present and possible future status of the ECU.

All in all, developments reviewed so far can be summarised by saying that the ECU has shown some advances, perhaps falling short of expectations in the official field, while running ahead of them in the private markets. It should be admitted however that, from a technical point of view, the EMS could on the whole continue to function without significant difficulties even without the ECU.

This technical consideration has not diminished the emphasis which many - and notably European political forces - have continued to place on the objective of assigning to the ECU a truly central role in the system.

The advocates of this approach insist on two points: (i) the ECU should be developed into a fully-fledged international reserve asset, eventually competing with the dollar; (ii) the ECU should gradually acquire the status of a true European currency, functioning parallel to national currencies in the initial phase, and eventually becoming the future common currency. The former objective is commonly related to developments in the official field, the latter to advances in private markets.[16/]

Recent evidence of this continuing interest is the mention of the ECU in the Treaty of Rome - the Constitutional Chart of the EC. The objective of monetary cooperation found explicit recognition in the revision of the texts approved in January 1986. The Preamble of the Single

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16/ The latter distinction could however be even reversed, under present arrangements: the private ECU arguably has more of the attributes of a reserve currency than the official ECU.

Act recalled that in 1972 the Heads of State or of Government had approved the goal of progressive realization of economic and monetary union, and a new Article (102 A) was introduced in the Treaty: "In order to ensure the convergence of economic and monetary policies which is necessary for the further development of the Community, Member states shall.....take account of the experience acquired in cooperation within the framework of the EMS and in developing the ECU..."[17/]

Motives to promote the ECU's role as an international reserve asset can be many-sided. To start with, this would reduce European dependence on the dollar, thereby allowing easier decoupling of policies in case of need. In a world characterized by floating exchange rates between major currencies and EMS exchange rate agreements, cohesion among the latter would per se reduce the impact of dollar swings.

This, however, creates a need for intra-EC international reserves. This demand might be satisfied by national currencies; but problems are likely to arise for single countries if liquid liabilities to foreign residents grow disproportionally. Confidence swings put a severe onus on domestic monetary policy. Thus, the availability of the ECU, in particular as an alternative to the DM, might lessen these difficulties and prevent EMS tensions from arising merely as a consequence of switches out of the dollar. These positive effects would be enhanced if the ECU was also used as an instrument for invoicing international transactions and pricing international commodities.

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17/ European Single Act, Brussels, 1986. To underline the relevance of the ECU, Sarcinelli (1985) argues that the difference between the snake and the EMS is the presence of the ECU. The same argument is made by the Governor of the Banque de France M. Camdessus.

If the ECU is to play an important role as an international reserve asset, it must be made usable as a means of international payments. This statement may appear trivial, but it is helpful to make the point that there is no inconsistency between the development of the ECU in the official and in the private spheres. On the contrary, it is impossible to advance the use of the ECU beyond a truly meaningful critical point, unless the two aspects are brought together in a complementary way. The ECU cannot become an effective international reserve asset unless it is used both by central banks and by private holders, and in particular by commercial banks.

ECU market intervention, invoicing [18/] and pricing in ECU, holding reserves in ECUs would represent the tripartite facets of a unique process leading to the establishment of the ECU as a full money in both the official and private sectors, in respect of its properties as a medium of exchange, unit of account and store of value.[19/] Uncertainty in the system would be reduced, also as an automatic result of the fact that the vehicle currency is an average of participating currencies.

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18/ On the general question of the choice of an invoice currency in international transactions see Bilson (1983). As to the specific rôle of the ECU, an important question is the development of deep and resilient forward markets. It has been pointed out to me by Governor Richard Mikkelsen and Mr. Herring Dalgaard that a key reason why the ECU finds difficulties in replacing other currencies for invoicing is that, while a company wanting to minimize its foreign exchange risk in connection with international trade can easily do so by using one of the major currencies for invoicing and then covering the entire risk in the forward market, the use of the ECU per se gives only a partial reduction of the exchange risk.

19/ Early proposals on these lines are contained in Ossola (1971) and Magnifico (1973).

If these considerations are accepted, then the development of the ECU as an international reserve asset is not an alternative to its development as a common currency, contrary to what many hold.

It follows from the arguments developed so far that the appropriate way to increase the use of the official ECU does not lie in placing additional obligations in intra-EMS transactions, such as obligatory settlement of intra-marginal interventions in ECUs or elimination of the present 50 per cent payments ratio. Both would have "symmetric" monetary base effects on surplus and deficit countries alike. This may be desirable once conditions of monetary stability have been achieved in all EMS countries, but not necessarily in the present transitional phase, where the degree of success is still uneven. A more fruitful approach would consist in ensuring transferability and convertibility of the official ECU, through an interchangeability between the official and the private sectors.

## VI. The ECU as a means of international payments: a suggested scheme.

Economic analysis shows that reserve currencies must be liquid, fully convertible into other currencies, and able to represent a stable store of value and provide a competitive return.

The "portfolio" results reported in Section IV suggest that the ECU basket has some of these properties. In view of the enlargement of the EEC, the basket should at any rate be opened up only to currencies entering into the Exchange Rate Agreements; otherwise there would be a risk of weakening the ECU because of the lack of policy commitment to exchange rate stability and monetary discipline.

However, the institutional aspects recalled in Sections I and II indicate that the official ECU shows important defects, notably in terms of transferability and convertibility. Admittedly, acceptance limits were introduced to protect against the risk of excessive ECU creation due to the automatic link to the price of gold. If the way to enhance the role of the ECU is to make it a useful reserve asset, a primary requirement is that central banks should be able to use the official ECU for intervention purposes in the market. The question becomes one of establishing appropriate links between the two components.

The problem and its possible solutions are not novel in the theory of international finance. They have already been addressed in discussions on the role and expansion of the SDR, and notable contributions have been made by the Bank of England in the Committee of Twenty (IMF, 1974), by Coats (1982) and by Kenen (1983). They provide a framework for analysis and policy prescription which can be adapted to the current problem of the ECU, especially in view of the package of improvements to the use of the official ECU recalled in Section II, according to which the BIS has been designated as "other holder" of official ECUs. Three types of approach to the question can be envisaged.

1. The most direct way to achieve transferability of the ECU between the official and private sectors would be to empower the EMCF to open accounts in official ECUs with private institutions, and notably commercial banks. This approach has evident drawbacks first of an economic nature, but also of legal and institutional character. According to existing legal provisions, official ECUs with the EMCF are created against contributions by central banks of EEC Member states of 20 per cent of their gold and dollars reserves. The total amount of primary official ECUs is

thus determined on an ex ante basis. Additionally, holders of official ECUs can only be EEC central banks and other designated official monetary agencies. To change these legal provisions would prove extremely difficult. A Council Regulation would be indispensable, as well as consultation with the European Parliament.

These difficulties apart, serious objections can be raised on strictly economic grounds. To start with, the total amount of high-powered ECUs would be influenced by operations undertaken at the initiative of the private sector which could hardly be acceptable by EEC central banks in the present situation. Moreover, the Fund operations would become extremely difficult from an operational point of view. Finally, serious problems would be encountered in selecting private agents with the direct possibility of holding official ECUs.

A variant of this approach would allow commercial banks to hold official ECUs with their central banks. The drawback here is that private international interbank transactions would be cleared only through transfers of official ECUs of the respective central banks. This, in turn, would imply those symmetric monetary base consequences which, as I have already explained, are regarded as undesirable by certain EEC monetary authorities under present conditions.

2. A second line of attack to the transferability question is to allow central banks to deposit with the EMCF <u>private</u> ECU balances. This scheme appears to be more directly aimed at widening the scope for mobilizing official ECUs: through the intermediary of the EMCF, EEC central banks and other official monetary agencies could more easily engage in swaps between private and official ECUs. However, this would not solve the problem of the convertibility of the ECU, since the mobilization operation

would always be subject to bilateral mutual consent by two monetary authorities.

3. The third model is based on the idea of linking the private and the official markets through the intermediary of a clearing house, recognized as an "other holder" of official ECUs. The scheme, originally suggested by Kenen for the SDR, would work along the following lines. Central bank A wishes to acquire foreign exchange with a view to intervening to support its currency, before reaching compulsory margins. A triangular operation is activated with a commercial bank in country B and the clearing house. Commercial bank B receives official ECUs sold by central bank A; since it cannot hold them, these are simultaneously deposited with the clearing house, in exchange for an instrument of deposit. Therefore, at the end of the operation central bank A has acquired a private ECU bank deposit in country B, which is readily usable for intervention purposes. It has lost official ECUs, which are in the books of the clearing house as an asset vis-à-vis the EMCF. Commercial bank B has recorded an increase in assets (deposits with the clearing house) and an increase in liabilities (deposits by central bank A). The clearing house holds an asset vis-à-vis the EMCF and an ECU liability with a commercial bank.

Further transactions between commercial bank B and other commercial banks can of course affect the ownership of deposits vis-à-vis the clearing house, but not that of official ECUs. Note also that intervention sales by central bank A of the private ECUs thus acquired would imply the usual "asymmetric" monetary base consequences: they would be concentrated on country A itself.

An advantage of this scheme is that it would not require any legal change - a joint decision by the Board of EEC Governors, the Board of the EMCF and the Board of the BIS would, in my opinion, be quite sufficient to make it operational. As mentioned earlier, the BIS has now been officially designated as an "other holder" of ECUs. Additionally, the existing ECU clearing house system MESA (Mutual ECU Settlement Account) comprising seven commercial banks (Crédit Lyonnais, Lloyds, Banque Bruxelles-Lambert, Kredietbank-Brussels, Kredietbank-Luxembourg, Société Générale-Bruxelles, Istituto Bancario San Paolo) will shortly be expanded under the auspices of the BIS, which will act as the final clearing institution. 20/ Since the EMCF and the BIS operate under the same roof, the implementation of the scheme suggested here would be facilitated. 21/

The fact that commercial banks are already working in terms of "open basket" ECUs also makes it easier to implement the scheme, since private and official ECUs are already standardised. A potentially important problem is, however, posed by the difference in yield, since private ECUs earn Eurocurrency rates and official ECUs domestic money market rates. But, given the present degree of financial deregulation, these differences are becoming smaller and should decline further; moreover, deposits with the BIS are likely to carry a security yield which may help offset the existing spread. The remaining gap would presumably have to be paid by the central bank initiating the operation (Central Bank A).

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20/ On these points see "Rôle of the BIS in a private ECU clearing system", BIS, February 1986.

21/ An intermediate step in the direction of this approach would consist in fostering swaps of private and official ECUs between a central bank in need of private ECUs and the BIS which performs the dual functions of commercial bank and "recognized other holder". This exchange is already possible under existing rules. On this see Padoa-Schioppa (1986).

In the initial phase various quantitative and qualitative limitations could be introduced to avoid excessive use of the proposed facility, the yield gap just referred to being in itself a limiting factor. They could be lifted progressively as the necessary experience is gained in operating the scheme. Some difficulties could also arise because of the precarious nature of the official ECUs, which would require revision to avoid the vagaries of gold price movements. This should not pose insurmountable problems, though the scheme is likely to put some pressure for consolidating the present three-month revolving swap system.[22/]

## VII. Monetary, credit and balance of payments implications of an increased use of private ECUs.

It has been the contention of this paper that the development of the ECU as an international reserve asset and, in perspective, as a common parallel currency are complementary processes, contrary to what many hold. The emphasis on market convertibility of the official ECU must have as counterpart an increased use of the ECU as a monetary and credit instrument by private economic agents, in international as well as domestic transactions. Therefore, it becomes necessary at this point to address these aspects of the process of ECU expansion, in conjunction with its balance of payments (exchange rate) implications.

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22/ It has been argued that the existing official ECU creation mechanism is a major impediment to the full use of the ECU, not only because of the temporary nature of the swap operation, but also as a consequence of the fact that the value of ECUs varies in line with factors outside the Community (e.g. gold and dollar prices). This is not the place to analyse the issue of how the arrangements could develop beyond the existing swap system. In the evolutionary perspective taken in this study, the problem should however receive early attention. On this issue see EEC Monetary Committee, Interim Report on the EMS, (1978), Padoa-Schioppa (1980), Masera (1980), Triffin (1984).

Let us start with the following question: To what extent does the existence of the ECU market affect the volume and geographical pattern of international capital flows?[23/]

Clearly, if the existence and expansion of the ECU market has differentiated credit and monetary implications in the EC countries, this will have spill-over effects on the respective balances of payments. Further to this general point I wish to make three preliminary considerations.

First, it is useful to recall that in some instances the ECU serves de facto as an indexation device for domestic credit contracts. If the Italian government issues to domestic residents debt instruments which are indexed to the ECU, there are balance of payments consequences only to the extent that the availability of ECU denominated assets satisfies residents' portfolio diversification demands that would otherwise have been met by the acquisition of foreign assets (i.e. through capital outflows). [24/]

Second, the ECU being a basket of currencies,[25/] its interest rate cannot diverge to any significant extent from the weighted average of interest rates in the component currencies. Accordingly, the ECU interest

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23/ For a general analysis of these issues see Mayer (1985).

24/ If this is the case, the argument for an expansion of ECU borrowing and lending between residents in countries which continue to have restrictions on capital movements is enhanced. On these points see Modigliani and Capponi (1985).

25/ I do not take up here the question of the possible redefinition of the ECU. I concur with Triffin who regards the issue as "revolutionary and premature at this stage, but imperative in the long, or even medium term" (Triffin (1984, p. 56)).

rate cannot play a significant role in clearing the ECU deposit and credit markets, especially at the short term end. As a spread between actual and theoretical rates tends to arise, arbitrage forces bundling or unbundling the ECU into its components will be set in motion.

Third, and more general, the currency denomination, per se, has no direct impact on the balance of payments of the country issuing the currency concerned. It may, however, exert indirect effects; it is in fact likely that residents of the country whose currency is used as vehicle currency will be stimulated to enter into international transactions (to activate capital flows) which would not have taken place otherwise, as a consequence of the close links between the Euromarket for the international currency and the domestic market. With specific reference to the ECU, one implication is that if a switch takes place from the dollar to the ECU as a currency of denomination, it is likely to result in a lower elasticity of capital flows to and from the United States, and in a higher intra-EEC capital market integration.

The above considerations reinforce, in general terms, the argument that efforts to analyze separately the effects of an increasing role of the ECU as a medium for international transactions and as a substitute for domestic currencies are bound to be futile, given the intimate relationships between the two processes.

In order to reach more specific conclusions, suppose now that an importer in country A decides to finance his trade by borrowing ECUs from the banking system, which we assume to be in a balanced position. The excess demand for credits in ECUs does not bid up the ECU interest rate; it is instead covered by the banking system by borrowing the component currencies so as to "bundle" the ECU. The autonomous (voluntary) capital inflow into country A sets in motion compensatory (involuntary) flows

denominated in the other EEC countries, linked to the respective weights in the basket. These funds will in general be borrowed in the Euromarkets. This, as we have seen, need not trigger capital flows from the various countries involved; it will do so only to the extent that the pressures on the Euro-currency markets spill over to the respective domestic money markets, i.e. according to the yield elasticity conditions prevailing in each single Euro-currency market.

In this way the ECU banking market tends to exert an influence on the balance of payments of the countries issuing the component currencies of the basket. As we have seen, this is an element of automaticity in the process, mechanically linked to currency weights in the ECU.

Let us now turn our attention to the monetary and credit implications of an increasing use of the private ECU in competitition with and as a substitute for domestic currencies.

We have seen that, when account is taken of its overall yield (interest adjusted for exchange-rate changes) and its variance and covariance, the ECU can find its place in efficient portfolios for European residents. This is on the basis of past experience, and it should be even more so in a perspective of increasing monetary cohesion in the EMS. With the risk of significant movements in intra-EEC exchange rates declining, EEC residents are likely to perceive the ECU as an increasingly closer substitute for the domestic currency than other foreign currencies.

Shifts towards the ECU are likely to occur in particular when, on the grounds of expected overall yield, investors are confident that the ECU would fare better than the domestic currency. The converse would be true for borrowers. It might then appear that the impetus to the market

would come at one time from the lending and at the other from the borrowing side, with the ECU banking system covering itself through bundling operations. This is not, however, a foregone conclusion.

Take now the following situation: (i) higher inflation/traditionally weak currencies in their convergence efforts maintain real yields, measured in terms of domestic inflation, higher than those prevailing in lower inflation countries; (ii) exchange rates do not conform to P.P.P., but show instead a trend towards appreciation - in terms of consumer price inflation - in weak currency countries. In these conditions it turns out to be advantageous to the weak-currency resident to borrow in ECUs and for the strong-currency resident to lend in ECUs, rather than in the domestic currency. Under these circumstances it would prove even more advantageous to activate direct capital flows between the countries in question. The ECU risk-cover properties can well explain that part of the flows that are intermediated by the ECU banking system: the ECU vehicle can provide a partial alternative to straight forward-cover operations.

Because of this, the ECU can facilitate intra-EEC capital movements; as such, it increases the efficiency and integration of European credit markets, while reducing the uncertainty costs for private operators. Inevitably these welfare gains are to some extent matched by the cost of reducing the independence of domestic monetary policies. The shifts in intermediation from the domestic markets to the external ECU market also raise the well-known question of the possible repercussions on overall credit and money creation processes.

The accepted view is that the question must be addressed in the light of the analysis of the money and credit creation potential of Eurocurrency markets. The common wisdom in this respect is that these markets largely represent a substitute for, and not an addition to, domestic money and credit. Net additions are relatively low, and are the direct consequence of the greater efficiency and the monetary base saving brought about by the growth of the Euromarkets. The mechanistic approach which stressed the analogy with a domestic banking system and argued that the actual and potential multipliers were very high - because of the low leakages into currency and reserves - has been discarded.[26/]

Being one of the first to develop a portfolio - as against a multiplier - approach to the workings of Euromarkets[27/], I continue to stand by that line of thought. I also share the view that the explanation for the growth of the ECU market to date is best approached along these lines.[28/] But, in my view, this is not the end of the story. In the prospect of a growing use of the ECU in the EEC, both domestically and internationally, I would like to stress some potentially important differences between the analysis of the ECU market and, say, the Eurodollar market.

Eurodollar balances have never had the possibility of becoming an internal means of payments of EEC countries' residents: checking facilities have not represented a significant feature of the markets;

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26/ A definitive paper on the argument is Swoboda (1980).

27/ See Masera (1972).

28/ For a development along these lines see P. Reynolds Allen (1985).

deposits, generally for very large amounts, could represent a temporary outlet for liquid funds, but were always closely linked to financial transactions of international operators.

Lack of reserve requirements and differential tax and supervisory treatment on Eurocurrency deposits, however advantageous, are not sufficient in themselves to activate a closed circuit of deposit formation and credit creation capable of becoming an alternative to domestic currency banking.

In the case of the ECU the situation is different. If use of the ECU in domestic as well as external bank transactions becomes significant, it could tend to supplant "controlled" bank operations. The ECU is in principle a close substitute for the domestic currency; if the advantages of Euro-transactions were allowed in respect of ordinary banking asset and liability transactions in ECUs, problems of monetary control would be encountered.

This is one aspect of the general problem posed by the growing internationalization and deregulation of financial markets. The specific ECU question is that it could - indeed should - fulfil the function of a substitute for the domestic currency better than any other "foreign" currency.

This argument is reinforced when account is taken of central bank redepositing in ECUs. It is commonly agreed, from the analysis of the Eurodollar market, that central bank redepositing of dollars in the Euromarket could trigger multiple expansion of deposits, credits and reserves. Take, for example, the case of a payments outflow from the United States and downward pressure on the dollar exchange rate. If central banks intervene to support the dollar and deposit the proceeds with the

Eurobanking system, which in turn re-lends the funds outside the U.S., an additional round of dollar interventions will ensue, and so the dance goes on.

In the case of the ECU a similar situation may exist under the following circumstances. Suppose that residents of country A find it cheaper to borrow in ECUs than in domestic currency. Starting from what is viewed as an equilibrium position by the monetary authorities of country A, the incipient capital inflow in ECUs would tend to put an upward pressure on the domestic exchange (and downward pressure on domestic interest rates). The central bank in country A intervenes in the exchange market to offset the exchange rate impulse and sterilizes the monetary base impact of the intervention. If the proceeds of the foreign currency purchase are re-lent to the ECU banking system a chain can be activated whereby domestic borrowers build up external ECU liabilities which have as counterpart "private" ECU assets held by the domestic central bank.

If we now add the possibility for residents to accumulate ECU deposits while avoiding reserve requirements[29/] and in addition make allowances for different risk behaviour and differences in expectations on exchange rates, we can see how a credit and monetary creation process could be set in motion. This would add to, rather than substitute for, domestic currency bank deposits and credit. If the ECU were to develop as a parallel domestic currency, it is not difficult to imagine how in any single country the competitive edge stemming from the lack of reserve requirements and/or

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29/ The argument here is that in general reserve requirements should apply to all residents' deposits, regardless of denomination. Care must be taken in imposing these requirements to avoid artificial biases in favour of low-interest rate currencies (see Masera (1982)).

other control devices on ECU banking would activate a monetary-credit circuit. In principle this would have no balance of payments repercussions if the process took place in all EEC countries, though a problem of credit and monetary control would arise. It is as if a system of non-bank intermediaries were created where deposits and credits fully competitive with those provided by the banks, but with no reserve cost, were offered.

## VIII. Summary and Conclusions.

I have reviewed the developments of the ECU, and pointed to the possible advantages of its increased use; the main contention of this paper is that efforts to make the ECU an international reserve asset and, eventually, a European common currency, should be regarded as complementary.

Market convertibility of the official ECU requires deep and resilient private markets. Interchangeability between the two sectors could be achieved without institutional changes if central banks could exchange their official deposits with commercial banks, which would in turn simultaneously redeposit them with the BIS. This international monetary institution, which would act as a clearing house for commercial banks, is empowered to deposit with the EMCF official ECU balances resulting from the settlements among participating banks. It enjoys in fact the status of "other holder".

It might be argued that the whole scheme, even if acceptable from a formal point view, has no real future, given the reservations of the German monetary authorities on the role and function of the ECU. On the

other hand, it should be recognised that their legal argument is losing weight. The greater the role of the ECU in private as well as official markets, the more difficult it becomes to maintain that the ECU is merely an indexation device. The legal concept of money has already changed and will continue to be adapted to economic changes. The fact that there is no "currency" in ECU, no central bank behind it, and no legal payments in ECUs, does not seem to me a sufficient reason to deny that the ECU has already acquired a wholly different monetary character with respect to its predecessor, the EUA, which was indeed only an indexation instrument.

Official ECUs do exist, and can be used for official settlements between central banks. The EMCF plays the role of a central institution overseeing the process of creation and distribution of official ECUs. Banking and foreign exchange payments in ECUs, not only between private operators, but also between market participants and official monetary authorities, amount to billions each year. Fines levied by the EEC Commission can be paid in ECUs.

If a market convertibility of the official ECU were to develop along the lines suggested here, it would become impossible to refuse to acknowledge a monetary and foreign-exchange character for the ECU. This statement may appear to beg the question of the German attitude. This is certainly so, but only to a point.

I have argued in this paper that, under present conditions of non-homogeneous success in securing domestic monetary stability, certain central banks, and notably the Bundesbank, manifest a preference for what I called asymmetric monetary base interventions in EEC currencies. I have also shown that this is precisely the character of intramarginal ECU

interventions in the market, as opposed to interventions at the margin which involve settlements in official ECUs or recourse to the VSTF mechanism. The conjecture made here is that the Bundesbank's attitude might not remain as negative as it is now. This argument would be reinforced if the UK were to join the Exchange Rate Agreement, in view of the large additional volume of interventions potentially required by the operation of the system.

The counterpart to an expanding use of the official ECU would be its increasing role as a substitute for domestic currency borrowing and lending, leading to its use as a parallel common currency. This process - I have argued - would have to be closely monitored, in order to prevent problems of money and credit control. It might indeed be desirable to consider the introduction of reserve requirements, or other control instruments, with a view to avoiding artificial incentives for ECU deposits by residents vis-à-vis domestic currency deposits held with the home banking system. Convergence in monetary control techniques would thereby be stimulated. Beyond the short-term frictions on individual countries' monetary policies, this must be regarded as an advantage in a prospect of European monetary integration.

The high substitutability which would develop in this scenario between the ECU and each currency in the EMS would increase capital mobility within the Community, largely because of the intrinsic properties of the ECU, and also as a result of the "involuntary" capital flows which are likely to be set in motion. There is a certain irony in the fact that countries which are more active and vociferous at the official level in pressing the case for further development of the ECU are also those where capital controls still exist.

If the two-pronged approach to developing the ECU suggested here were followed, the ECU could become an instrument with which to foster European monetary integration, without at the same time threatening monetary stability and credit control.

It must be made very clear, however, that this would be so if and only if the efforts to further develop the official ECU and the advances made by the markets in its use were not seen by EEC governments and citizens as alternatives to the adjustments to domestic monetary conditions consistent with the objective of achieving a zone of monetary stability.

I do not dwell on these points here; Robert Triffin and I already expounded them in great detail in a recent paper (Masera and Triffin (1984)). Let me simply recall that i) domestic cost formation processes and ii) public sector deficits must be the primary target of economic policy actions leading to integration. It is no accident that it is countries like Italy, Ireland and Belgium - characterized by very high public deficits and public debt/GDP ratios - which encounter difficulties in the process of monetary and exchange-rate stabilization in the EMS. It should also be self-evident that capital liberalization in the EEC is a prerequisite for any meaningful attempt to achieve greater monetary convergence and integration.

I conclude therefore on a sober note, primarily for domestic consumption. While the ECU could be a useful instrument in building a European monetary dimension, it remains true that the objective of gradual integration leading to monetary unification could be achieved even without the ECU. Finally, if the development of the ECU is an alibi for not tackling fundamental economic imbalances which impede domestic monetary stability, this potentially useful instrument would turn out to be counterproductive.

Table 1

**FOREIGN EXCHANGE INTERVENTIONS (1)**
**BY COUNTRIES IN THE EMS EXCHANGE RATE ARRANGEMENTS**
(In billions of US$)

| | | March 1979 - March 1983 | April 1983 - December 1985 |
|---|---|---|---|
| **US dollars** | P | 34.8 | 18.8 |
| | S | 107.0 | 49.1 |
| **EMS currencies** (2) | | | |
| - at the limits(3) | | 28.0 | 7.9 |
| - intramarginal | P | 11.8 | 27.9 |
| | S | 22.5 | 15.7 |
| **others** (4) | P | 0.1 | 3.2 |
| | S | 2.4 | 0.7 |
| **TOTAL** | **gross** | 206.6 | 123.3 |
| | **net**(5) | - 85.2 | - 15.6 |
| **memorandum items** | | | |
| - recourse to VSTF (6) | | 20.9 | 3.4 |
| - ECU spot settlements of intervention | | 6.9 | 0.1 |

(1) P = purchases; S = sales. According to the BIS recording practices, interventions figures do not include operations such as customer transactions, swaps with commercial banks and forward settlements or other transactions which constituted a significant source of positive changes in gross official reserves. This explains why the recorded total change is a high negative figure. (2) Currencies participating in the exchange arrangements. (3) Purchases and sales taken together. (4) The figure for 1985 includes some interventions in the private ECU market. (5) A minus sign indicates net sales. (6) Very-short-term financing facility.

Source: Update of: Micossi S. The Intervention and Financial Mechanisms of the EMS and the Role of the ECU. B.N.L.Quarterly Review, December 1985.

Table 2

DEVELOPMENT OF THE ECU BANKING MARKET
IN COMPARISON WITH OTHER CURRENCY SECTORS OF
THE INTERNATIONAL BANKING MARKET IN EUROPE (1)

(in US dollar billions)

| Currencies | Amounts outstanding at: | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | End-Dec. 1982 | | End-Dec. 1983 | | End-Dec. 1984 | | End-Dec. 1985 | |
| | Assets | Liabilities | Assets | Liabilities | Assets | Liabilities | Assets | Liabilities |
| US dollar | 832.4 | 869.5 | 869.2 | 908.5 | 893.4 | 943.9 | 924.8 | 978.6 |
| Deutsche Mark | 155.9 | 141.6 | 150.0 | 135.6 | 142.9 | 132.6 | 204.1 | 191.2 |
| Swiss Franc | 79.0 | 71.5 | 77.0 | 70.7 | 67.6 | 62.1 | 103.1 | 92.8 |
| Japanese Yen | 30.6 | 31.8 | 28.9 | 33.4 | 32.6 | 32.0 | 71.6 | 68.3 |
| ECU | 6.5e | 5.5e | 11.9 | 10.0 | 28.2 | 22.3 | 53.8 | 47.8 |
| Pound Sterling | 15.5 | 18.0 | 14.8 | 16.4 | 16.6 | 17.6 | 26.1 | 29.1 |
| Others | 63.8 | 67.4 | 70.2 | 69.8 | 63.9 | 64.7 | 88.5 | 95.3 |
| Total | 1,183.7 | 1,205.3 | 1,222.0 | 1,244.4 | 1,245.2 | 1,275.2 | 1,472.0 | 1,503.1 |

(e) = estimated
(1) Domestic and external positions of reporting banks in Europe.
Source: BIS, Quarterly Statistics on International Banking Developments.

Table 3

**STRUCTURE OF THE ECU BANKING MARKET**
(Amounts outstanding in ECU billions at end-December 1985)

| Items | Assets | | | | | Liabilities | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Total | of which vis-à-vis | | | | Total | of which vis-à-vis | | | |
| | | Non - residents | | Residents | | | Non - residents | | Residents | |
| | | banks | non-banks | banks | non-banks | | banks | non-banks | banks | non-banks |
| Banks in: | | | | | | | | | | |
| Belgium | 10.4 | 6.9 | 1.4 | 2.0 | 0.1 | 8.6 | 5.6 | 0.8 | 1.9 | 0.3 |
| Luxembourg | 7.0 | 3.2 | 1.8 | 1.8 | 0.2 | 6.7 | 2.6 | 1.3 | 2.0 | 0.8 |
| France | 16.0 | 8.5 | 1.5 | 4.3 | 1.7 | 12.3 | 7.4 | 0.5 | 4.3 | 0.1 |
| Italy | 8.2 | 4.7 | - | 0.8 | 2.7 | 8.6 | 7.6 | 0.1 | 0.8 | 0.1 |
| Netherlands | 4.1 | 3.1 | 0.5 | 0.3 | 0.2 | 3.8 | 1.4 | 0.6 | 0.3 | 1.5 |
| United Kingdom | 12.2 | 7.5 | 1.5 | 2.7 | 0.5 | 11.4 | 8.2 | 0.2 | 2.4 | 0.6 |
| Others (*) | 3.1 | 1.1 | 1.1 | 0.2 | 0.7 | 2.9 | 2.3 | 0.2 | 0.2 | 0.2 |
| TOTAL | 61.0 | 35.0 | 7.8 | 12.1 | 6.1 | 54.3 | 35.1 | 3.7 | 11.9 | 3.6 |
| m.i. in US dollar terms | 54.2 | 31.1 | 6.9 | 10.8 | 5.4 | 48.2 | 31.1 | 3.2 | 10.6 | 3.2 |

(*) Austria, Denmark, Germany, Ireland, Japan, Spain and Sweden.

Source: BIS, Quarterly Statistics on International Banking Developments.

Table 4

COMPARISON BETWEEN EC NON-BANKS' ECU DENOMINATED ASSETS AND LIABILITIES VIS-A-VIS BANKS AND THEIR OVERALL SUPPLY AND RECOURSE TO DOMESTIC AND INTERNATIONAL BANK CREDIT MARKETS

(Amounts oustanding at end-March 1985 in ECU billions)

| Borrowing or lending banks | Outstanding borrowing | | | Outstanding deposits | | |
|---|---|---|---|---|---|---|
| | In ECUs | Overall (1) | a in % of b | In ECUs | Overall (2) | d in % of e |
| | a | b | c | d | e | f |
| Domestic banks | 7.7 | 1,488.3 | 0.52 | 1.9 | 1,465.7 | 0.13 |
| Foreign banks | 3.0 | 155.3 | 1.93 | 1.3 | 71.6 | 1.82 |
| TOTAL | 10.7 | 1,643.6 | 0.65 | 3.2 | 1,537.3 | 0.21 |

.. = not available - = nil

(1) Domestic bank lending to the private sector in EC countries and international bank lending to EC residents (excluding Greece).
(2) Broad money stock in EC countries and externally-held bank deposits of EC residents.

Source: BIS, Annual Report 1984/85 and Quarterly Statistics on International Banking Developments; Committee of Governors of EEC Central Banks, Monthly Statistics.

Table 5

CURRENCY DISTRIBUTION OF EXTERNAL BOND OFFERINGS

Per cent

| | 1982 | 1983 | 1984 | 1985 |
|---|---|---|---|---|
| U.S. dollar | 63.9 | 57.0 | 64.2 | 61.1 |
| Swiss franc | 15.0 | 17.5 | 11.8 | 8.9 |
| Yen | 5.0 | 5.3 | 5.4 | 7.7 |
| Deutschemark | 7.1 | 8.6 | 6.0 | 6.7 |
| ECU | 1.1 | 2.8 | 2.6 | 4.2 |
| Sterling | 2.6 | 3.9 | 5.0 | 4.0 |
| Australian dollar | - | 0.3 | 0.3 | 1.8 |
| Canadian dollar | 1.6 | 1.4 | 2.0 | 1.7 |
| Dutch guilder | 1.1 | 1.2 | 0.8 | 0.6 |
| Other | 2.6 | 2.0 | 1.9 | 3.3 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 |
| Memorandum item: | | | | |
| Total issues (U.S. $ billion) | 75.5 | 77.2 | 111.5 | 167.8 |

Source: OECD.

Table 6

**ECU BONDS:** breakdown by borrowing country/institution
(volume - millions ECU)

| | 1981 | 1982 | 1983 | 1984 | 1985 | Total |
|---|---|---|---|---|---|---|
| EEC | | | | | | |
| EEC Institutions | 97 | 192 | 580 | 1,030 | 880 | 2,779 |
| Italy (1) | 65 | 1,240 | 600 | 1,425 | 3,445.5 | 6,775.5 |
| France | | 360 | 527.2 | 570 | 1,870 | 3,327.2 |
| West Germany | | | | 50 | 240 | 290 |
| United Kingdom | | | 50 | 140 | 260 | 450 |
| Belgium | | | 165 | 7.8 | 163.5 | 336.3 |
| Luxembourg | | | | 60 | 40 | 100 |
| Denmark | | | | 137 | 425 | 562 |
| Ireland | | 30 | 60 | 100 | 200 | 390 |
| Netherlands | | | | | 300 | 300 |
| Total | 162 | 1,822 | 1,982.2 | 3,519.8 | 7,824 | 15,310 |
| OTHER EUROPEAN INSTITUTIONS | | 55 | 35 | 40 | 225 | 355 |
| REST OF THE WORLD | | | | | | |
| Spain | | | | 46.5 | | 46.5 |
| Austria | | | | 160 | 132.5 | 292.5 |
| Norway | | | 70 | | 70 | 140 |
| Sweden | | | 140 | 147.5 | 60 | 347.5 |
| Finland | | | | 85 | 273.5 | 358.5 |
| USA | | 15 | 40 | 96 | 1,182.5 | 1,333.5 |
| Canada | 40 | 50 | 50 | 85 | | 225 |
| Japan | | | 80 | 170 | 831 | 1,081 |
| Australia | | | | 90 | 265 | 355 |
| South Africa | | | | 80 | 150 | 230 |
| Others | | | | 175 | 600 | 775 |
| International Institut. | | | 150 | 200 | 585 | 935 |
| Total | 40 | 65 | 530 | 1,335 | 4,149.5 | 6,119.5 |
| **WORLD TOTAL** | **202** | **1,942** | **2,547.2** | **4,894.8** | **12,198.5** | **21,784.5** |

(1) Includes issues targeted to Italian residents.

Source: ECU Newsletter.

Table 7

SPREADS (1)
BETWEEN BUYING AND SELLING RATES
IN THE EXCHANGE MARKETS

| | In absolute terms against | | In 0/00 (2) against | |
|---|---|---|---|---|
| | USD | ECU | USD | ECU |
| ECU ..... | 0.0005 | - | 0.6 | - |
| DEM ..... | 0.0010 | 0.0005 | 0.4 | 0.2 |
| FRF ..... | 0.0035 | 0.0020 | 0.4 | 0.3 |
| BEC ..... | 0.02-3 | 0.015-20 | 0.4-0.6 | 0.3-0.5 |
| BEL ..... | 0.05 | 0.040-50 | 0.9 | 0.9-1.1 |
| DKR ..... | 0.0025 | 0.0025 | 0.3 | 0.3 |
| NLG ..... | 0.0010-15 | 0.0008 | 0.3-0.5 | 0.3 |
| IEP ..... | 0.0007 | 0.0005 | 0.6 | 0.4 |
| ITL ..... | 0.75-1.00 | 1.00 | 0.4-0.5 | 0.7 |
| GBP ..... | 0.0005-7 | 0.0010-15 | 0.3-0.5 | 0.6-0.9 |
| GRD ..... | 0.10 | 0.20 | 0.6 | 1.5 |

(1) Standard spreads observed in the interbank markets during October 1985.
(2) On the basis of exchange rates prevailing in October 1985.
SOURCE: Committee of Governors of the EEC Central Banks.

Table 8

CENTRAL-BANKS TRANSACTIONS AND HOLDINGS IN PRIVATE ECUS
FROM JANUARY 1984 TO DECEMBER 1985 INCLUSIVE
(IN ECU MILLION)

| Country and year | Purchases (P.) and Sales (S.) against domestic currency | | | | Purchases (P.) and Sales (S.) against foreign currency | | Other transactions (Net) | Increase/Decrease in ECU liabilities(1) | Increase/Decrease in ECU net holdings | Net holdings at end of period | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | on the market | | off the market | | | | | | | In absolute terms | % of foreign exchange holdings (2) |
| | P. | S. | P. | S. | P. | S. | | | | | |
| Total European Community | | | | | | | | | | | |
| 1984 | 61 | - | 1,078 | 43 | 33 | 1,026 | 36 | -9 | 130 | 953 | 1.12 |
| 1985 | 1,530 | 870 | 1,589 | 165 | 151 | 1,358 | -177 | 8 | 708 | 1,662 | 2.22 |
| of which: Italy | | | | | | | | | | | |
| 1984 | 57 | - | 898 | 25 | - | 819 | 25 | - | 136 | 776 | 4.49 |
| 1985 | 275 | 759 | 1,071 | 103 | 50 | 760 | - | - | -226 | 550 | 5.10 |

(1) (-) Denotes increase in liabilities.
(2) Convertible currency holdings only.
Source: Committee of Governors of the EEC Central Banks.

Table 9a

## REWARD TO VARIABILITY RATIOS: MAIN CURRENCIES AND CURRENCY BASKETS

### Period: 73 IQ - 85 IVQ

YIELDS ON FOREIGN INVESTMENTS
(ANNUALIZED PERCENTAGE VALUES)

| Basis currency | U.S. $ | YEN | D.M. | FR.FR. | STG.P. | D.GLR. | SDR | ECU | LIRA |
|---|---|---|---|---|---|---|---|---|---|
| U.S. $ | 8.501 | 7.804 | 8.425 | 7.148 | 6.838 | 6.997 | 8.011 | 7.326 | 6.743 |
| YEN | 6.097 | 5.341 | 5.992 | 4.835 | 4.53 | 4.584 | 5.617 | 4.991 | 4.539 |
| D.M. | 7.305 | 6.579 | 7.214 | 5.997 | 5.69 | 5.796 | 6.82 | 6.164 | 5.646 |
| FR.FR. | 12.45 | 11.95 | 12.42 | 10.95 | 10.63 | 10.96 | 11.95 | 11.17 | 10.37 |
| STG.P. | 12.68 | 12.08 | 12.65 | 11.16 | 10.85 | 11.19 | 12.17 | 11.38 | 10.57 |
| D.GLR. | 8.133 | 7.427 | 8.053 | 6.794 | 6.485 | 6.628 | 7.645 | 6.969 | 6.406 |
| SDR | 8.931 | 8.245 | 8.86 | 7.562 | 7.251 | 7.428 | 8.439 | 7.744 | 7.137 |
| ECU | 11.44 | 10.81 | 11.4 | 9.974 | 9.658 | 9.945 | 10.94 | 10.18 | 9.436 |
| LIRA | 17.58 | 17.11 | 17.62 | 15.88 | 15.55 | 16.11 | 17.05 | 16.15 | 15.07 |

YIELDS ON FOREIGN INVESTMENTS: STANDARD DEVIATIONS
(PERCENTAGE VALUES)

| Basis currency | U.S. $ | YEN | D.M. | FR.FR. | STG.P. | D.GLR. | SDR | ECU | LIRA |
|---|---|---|---|---|---|---|---|---|---|
| U.S. $ | 2.549 | 23.43 | 25.12 | 22.31 | 23.55 | 22.57 | 9.512 | 19.43 | 18.19 |
| YEN | 22.37 | .8783 | 23.53 | 20.8 | 24.02 | 21.92 | 16.12 | 19.25 | 19.08 |
| D.M. | 24.85 | 22.3 | 2.834 | 12.31 | 20.47 | 6.815 | 15.32 | 8.393 | 14.33 |
| FR.FR. | 25.86 | 21.46 | 14.05 | 2.433 | 21.49 | 12.8 | 15.81 | 9.476 | 13.82 |
| STG.P. | 25.02 | 25.5 | 23.84 | 20.74 | 2.19 | 20.67 | 17.26 | 16.21 | 19.4 |
| D.GLR. | 24.37 | 22.73 | 6.136 | 10.9 | 19.75 | 2.307 | 14.59 | 6.358 | 12.44 |
| SDR | 11.6 | 16.67 | 16.27 | 13.68 | 17.35 | 14.19 | 1.952 | 10.32 | 11.55 |
| ECU | 22.32 | 20.26 | 10.29 | 8.853 | 16.57 | 7.166 | 11.79 | 1.849 | 9.63 |
| LIRA | 23.65 | 23.51 | 19.36 | 13.97 | 20.29 | 15.5 | 15.08 | 10.37 | 2.585 |

FOREIGN INVESTMENTS: REWARD TO VARIABILITY RATIOS
(PERCENTAGE VALUES)

| Basis currency | U.S. $ | YEN | D.M. | FR.FR. | STG.P. | D.GLR. | SDR | ECU | LIRA |
|---|---|---|---|---|---|---|---|---|---|
| U.S. $ | 333.5 | 33.31 | 33.54 | 32.03 | 29.03 | 31 | 84.22 | 37.71 | 37.08 |
| YEN | 27.26 | 608.1 | 25.46 | 23.25 | 18.86 | 20.91 | 34.84 | 25.92 | 23.79 |
| D.M. | 29.39 | 29.5 | 254.6 | 48.71 | 27.79 | 85.05 | 44.51 | 73.45 | 39.4 |
| FR.FR. | 48.15 | 55.25 | 88.45 | 450 | 49.47 | 85.65 | 75.57 | 117.8 | 75.01 |
| STG.P. | 50.66 | 47.38 | 53.06 | 53.83 | 495.1 | 54.12 | 70.51 | 70.23 | 54.49 |
| D.GLR. | 33.37 | 32.67 | 131.2 | 62.34 | 32.83 | 287.3 | 52.41 | 109.6 | 51.49 |
| SDR | 76.99 | 49.45 | 54.47 | 55.28 | 41.8 | 52.34 | 432.3 | 75.06 | 61.82 |
| ECU | 51.25 | 53.39 | 110.8 | 112.7 | 58.27 | 138.8 | 92.78 | 550.6 | 97.99 |
| LIRA | 74.34 | 72.78 | 90.99 | 113.7 | 76.66 | 104 | 113.1 | 155.7 | 582.9 |

Table 9b

## REWARD TO VARIABILITY RATIOS: MAIN CURRENCIES AND CURRENCY BASKETS

### Period: 79 IIQ - 85 IVQ

YIELDS ON FOREIGN INVESTMENTS
(ANNUALIZED PERCENTAGE VALUES)

| Basis currency | U.S. $ | YEN | D.M. | FR.FR. | STG.P. | D.GLR. | SDR | ECU | LIRA |
|---|---|---|---|---|---|---|---|---|---|
| U.S. $ | 10.48 | 6.141 | 3.351 | 3.98 | 6.322 | 2.8 | 7.443 | 4.59 | 5.963 |
| YEN | 9.723 | 5.374 | 2.626 | 3.285 | 5.604 | 2.079 | 6.699 | 3.88 | 5.282 |
| D.M. | 15.36 | 11.05 | 7.999 | 8.432 | 10.93 | 7.424 | 12.2 | 9.139 | 10.32 |
| FR.FR. | 19.96 | 15.69 | 12.39 | 12.63 | 15.27 | 11.79 | 16.7 | 13.43 | 14.44 |
| STG.P. | 16.35 | 12.06 | 8.949 | 9.343 | 11.87 | 8.37 | 13.18 | 10.07 | 11.21 |
| D.GLR. | 15.89 | 11.59 | 8.511 | 8.923 | 11.43 | 7.934 | 12.73 | 9.64 | 10.8 |
| SDR | 12.86 | 8.532 | 5.614 | 6.148 | 8.564 | 5.052 | 9.761 | 6.805 | 8.085 |
| ECU | 17.62 | 13.33 | 10.15 | 10.5 | 13.06 | 9.567 | 14.41 | 11.25 | 12.34 |
| LIRA | 22.29 | 18.04 | 14.61 | 14.77 | 17.48 | 14 | 18.98 | 15.61 | 16.52 |

YIELDS ON FOREIGN INVESTMENTS: STANDARD DEVIATIONS
(PERCENTAGE VALUES)

| Basis currency | U.S. $ | YEN | D.M. | FR.FR. | STG.P. | D.GLR. | SDR | ECU | LIRA |
|---|---|---|---|---|---|---|---|---|---|
| U.S. $ | 2.104 | 24.94 | 23.36 | 23.87 | 27.78 | 24.61 | 10.17 | 22 | 19.65 |
| YEN | 23.55 | .553 | 21.4 | 20.3 | 25.11 | 21.65 | 16.62 | 19.57 | 17.73 |
| D.M. | 25.41 | 22.83 | 2.246 | 6.584 | 21.01 | 4.45 | 14.63 | 4.449 | 6.668 |
| FR.FR. | 27.98 | 22.39 | 9.872 | 1.902 | 22.58 | 10.01 | 16.67 | 7.506 | 9.705 |
| STG.P. | 28.58 | 27.68 | 20.96 | 21.28 | 2.05 | 20.07 | 19.47 | 17.18 | 20.78 |
| D.GLR. | 26.51 | 23.34 | 3.605 | 6.415 | 20.81 | 2.031 | 15.37 | 4.307 | 6.971 |
| SDR | 12.22 | 17.68 | 13.78 | 13.91 | 20.21 | 14.93 | 1.702 | 11.72 | 9.575 |
| ECU | 24.95 | 21.32 | 6.044 | 5.489 | 18.09 | 6.239 | 13.26 | 1.73 | 6.244 |
| LIRA | 24.95 | 21.86 | 8.665 | 6.996 | 21.34 | 9.404 | 13.05 | 5.977 | 2.358 |

FOREIGN INVESTMENTS: REWARD TO VARIABILITY RATIOS
(PERCENTAGE VALUES)

| Basis currency | U.S. $ | YEN | D.M. | FR.FR. | STG.P. | D.GLR. | SDR | ECU | LIRA |
|---|---|---|---|---|---|---|---|---|---|
| U.S. $ | 498.4 | 24.62 | 14.35 | 16.67 | 22.76 | 11.38 | 73.22 | 20.86 | 30.34 |
| YEN | 41.29 | 971.9 | 12.27 | 16.18 | 22.31 | 9.6 | 40.31 | 19.82 | 29.79 |
| D.M. | 60.44 | 48.41 | 356.1 | 128.1 | 52.01 | 166.8 | 83.4 | 205.4 | 154.8 |
| FR.FR. | 71.34 | 70.06 | 125.5 | 664.3 | 67.64 | 117.8 | 100.1 | 179 | 148.8 |
| STG.P. | 57.22 | 43.56 | 42.69 | 43.91 | 578.8 | 41.7 | 67.69 | 58.61 | 53.97 |
| D.GLR. | 59.97 | 49.68 | 236.1 | 139.1 | 54.94 | 390.6 | 82.83 | 223.8 | 154.9 |
| SDR | 105.2 | 48.26 | 40.75 | 44.21 | 42.38 | 33.83 | 573.4 | 58.06 | 81.05 |
| ECU | 70.62 | 62.52 | 168 | 191.2 | 72.18 | 153.3 | 108.7 | 650.1 | 197.7 |
| LIRA | 89.36 | 82.52 | 168.6 | 211.1 | 81.89 | 148.9 | 145.4 | 261.2 | 700.7 |

Table 10a

## COMPOSITION OF EFFICIENT PORTFOLIOS

### Period: 73 IQ - 85 IVQ

BASIS CURRENCY: U.S. $

EFFICIENT PORTFOLIOS FRONTIER

| | YEN | D.M. | FR.FR. | STG.P. | D.GLR. | SDR | ECU | LIRA | E | S | E/S (%) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 8.425 | 25.12 | 33.54 | |
| (*) | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 8.011 | 9.512 | 84.22 | (*) |

BASIS CURRENCY: YEN

EFFICIENT PORTFOLIOS FRONTIER

| | U.S. $ | D.M. | FR.FR. | STG.P. | D.GLR. | SDR | ECU | LIRA | E | S | E/S (%) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6.097 | 22.37 | 27.26 | |
| | .5657 | .4343 | 0 | 0 | 0 | 0 | 0 | 0 | 6.051 | 19.1 | 31.69 | |
| | 0 | .1243 | 0 | 0 | 0 | .8757 | 0 | 0 | 5.664 | 16.29 | 34.77 | |
| | 0 | .004839 | 0 | 0 | 0 | .9952 | 0 | 0 | 5.619 | 16.12 | 34.85 | |
| | 0 | 0 | .007362 | 0 | 0 | .9926 | 0 | 0 | 5.611 | 16.12 | 34.81 | |
| | 0 | 0 | .04551 | 0 | 0 | .9545 | 0 | 0 | 5.581 | 16.1 | 34.66 | |
| (*) | 0 | 0 | .04666 | 0 | 0 | .9184 | 0 | .03495 | 5.543 | 16.1 | 34.43 | (*) |

BASIS CURRENCY: D.M.

EFFICIENT PORTFOLIOS FRONTIER

| | U.S. $ | YEN | FR.FR. | STG.P. | D.GLR. | SDR | ECU | LIRA | E | S | E/S (%) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7.305 | 24.85 | 29.39 | |
| | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 6.82 | 15.32 | 44.51 | |
| | 0 | 0 | 0 | 0 | 0 | .3998 | .6002 | 0 | 6.426 | 10.42 | 61.69 | |
| | 0 | 0 | 0 | 0 | .2966 | .2294 | .4739 | 0 | 6.205 | 8.358 | 74.25 | |
| | 0 | .05446 | 0 | 0 | .6486 | 0 | .2969 | 0 | 5.948 | 6.811 | 87.33 | |
| | 0 | .05429 | 0 | 0 | .7966 | 0 | .1491 | 0 | 5.894 | 6.678 | 88.25 | |
| (*) | 0 | .05415 | .03428 | 0 | .895 | 0 | .01659 | 0 | 5.852 | 6.65 | 87.99 | (*) |

BASIS CURRENCY: FR.FR.

EFFICIENT PORTFOLIOS FRONTIER

| | U.S. $ | YEN | D.M. | STG.P. | D.GLR. | SDR | ECU | LIRA | E | S | E/S (%) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12.45 | 25.86 | 48.15 | |
| | .1687 | 0 | .8313 | 0 | 0 | 0 | 0 | 0 | 12.43 | 13.39 | 92.84 | |
| | .0836 | .1608 | .7556 | 0 | 0 | 0 | 0 | 0 | 12.34 | 12.48 | 98.85 | |
| | 0 | .1394 | .7055 | 0 | 0 | .1551 | 0 | 0 | 12.27 | 12.13 | 101.1 | |
| | 0 | .1439 | .6785 | 0 | 0 | .1776 | 0 | 0 | 12.26 | 12.07 | 101.5 | |
| | 0 | .1302 | .3517 | 0 | 0 | 0 | .5181 | 0 | 11.7 | 10.18 | 114.9 | |
| | 0 | .0554 | 0 | 0 | 0 | 0 | .9446 | 0 | 11.2 | 9.42 | 118.9 | |
| (*) | 0 | .05083 | 0 | 0 | 0 | 0 | .9492 | 0 | 11.2 | 9.42 | 118.9 | (*) |

BASIS CURRENCY: STG.P.

EFFICIENT PORTFOLIOS FRONTIER

| | U.S. $ | YEN | D.M. | FR.FR. | D.GLR. | SDR | ECU | LIRA | E | S | E/S (%) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12.68 | 25.02 | 50.66 | |
| | .4687 | 0 | .5313 | 0 | 0 | 0 | 0 | 0 | 12.66 | 20.13 | 62.9 | |
| | .4402 | .03277 | .507 | 0 | 0 | 0 | 0 | 0 | 12.63 | 19.87 | 63.58 | |
| | .223 | 0 | .3904 | 0 | 0 | .3866 | 0 | 0 | 12.47 | 18.67 | 66.8 | |
| | 0 | 0 | .261 | 0 | 0 | .739 | 0 | 0 | 12.29 | 17.44 | 70.48 | |
| | 0 | 0 | .1864 | 0 | 0 | .8136 | 0 | 0 | 12.26 | 17.26 | 71.03 | |
| | 0 | 0 | 0 | 0 | 0 | .663 | .337 | 0 | 11.9 | 16.06 | 74.14 | |
| (*) | 0 | 0 | 0 | 0 | 0 | .3606 | .6394 | 0 | 11.67 | 15.69 | 74.34 | (*) |

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E = Portfolio return

S = Portfolio standard deviation

(*)=Minimum risk portfolio

Table 10a

CONTINUED

BASIS CURRENCY: D.GLR.

EFFICIENT PORTFOLIOS FRONTIER

| U.S. $ | YEN | D.M. | FR.FR. | STG.P. | SDR | ECU | LIRA | E | S | E/S (%) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8.133 | 24.37 | 33.37 | |
| .05653 | 0 | .9435 | 0 | 0 | 0 | 0 | 0 | 8.057 | 5.997 | 134.4 | |
| .05561 | .001622 | .9428 | 0 | 0 | 0 | 0 | 0 | 8.056 | 5.991 | 134.5 | |
| .04832 | 0 | .9138 | 0 | 0 | 0 | .0379 | 0 | 8.016 | 5.785 | 138.6 | |
| 0 | 0 | .7357 | 0 | 0 | 0 | .2643 | 0 | 7.766 | 4.692 | 165.5 | |
| (*)0 | 0 | .5165 | 0 | 0 | 0 | .4835 | 0 | 7.529 | 4.239 | 177.6 | (*) |

BASIS CURRENCY: SDR

EFFICIENT PORTFOLIOS FRONTIER

| U.S. $ | YEN | D.M. | FR.FR. | STG.P. | D.GLR. | ECU | LIRA | E | S | E/S (%) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8.931 | 11.6 | 76.99 | |
| .6145 | 0 | .3855 | 0 | 0 | 0 | 0 | 0 | 8.904 | 5.624 | 158.3 | |
| .5241 | .1546 | .3213 | 0 | 0 | 0 | 0 | 0 | 8.802 | 3.966 | 222 | |
| .5046 | .1606 | .3007 | 0 | .03406 | 0 | 0 | 0 | 8.742 | 3.552 | 246.1 | |
| .4609 | .1497 | .1956 | .1123 | .08162 | 0 | 0 | 0 | 8.524 | 2.552 | 334 | |
| .4376 | .1439 | .1224 | .1135 | .07661 | 0 | .106 | 0 | 8.414 | 2.404 | 350 | |
| (*).4346 | .143 | .116 | .1142 | .07693 | 0 | .1114 | .003891 | 8.4 | 2.402 | 349.7 | (*) |

BASIS CURRENCY: ECU

EFFICIENT PORTFOLIOS FRONTIER

| U.S. $ | YEN | D.M. | FR.FR. | STG.P. | D.GLR. | SDR | LIRA | E | S | E/S (%) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11.44 | 22.32 | 51.25 | |
| .2175 | 0 | .7825 | 0 | 0 | 0 | 0 | 0 | 11.41 | 8.699 | 131.1 | |
| .1744 | .08063 | .745 | 0 | 0 | 0 | 0 | 0 | 11.36 | 8.216 | 138.2 | |
| 0 | .03852 | .6409 | 0 | 0 | 0 | .3206 | 0 | 11.23 | 7.349 | 152.8 | |
| 0 | .03905 | .6386 | 0 | 0 | 0 | .3224 | 0 | 11.23 | 7.342 | 152.9 | |
| 0 | .04035 | .6313 | 0 | .01416 | 0 | .3142 | 0 | 11.2 | 7.21 | 155.4 | |
| 0 | .0347 | .5634 | .08278 | .05137 | 0 | .2678 | 0 | 11.05 | 6.325 | 174.7 | |
| 0 | .02239 | .408 | .1852 | .1193 | 0 | .07915 | .186 | 10.51 | 3.987 | 263.7 | |
| 0 | .02902 | .1903 | .209 | .1338 | .2241 | 0 | .2138 | 10.11 | 3.165 | 319.3 | |
| (*)0 | .02516 | .125 | .2153 | .1332 | .2875 | 0 | .2138 | 10.01 | 3.125 | 320.3 | (*) |

BASIS CURRENCY: LIRA

EFFICIENT PORTFOLIOS FRONTIER

| U.S. $ | YEN | D.M. | FR.FR. | STG.P. | D.GLR. | SDR | ECU | E | S | E/S (%) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 17.62 | 19.36 | 90.99 | |
| .3751 | 0 | .6249 | 0 | 0 | 0 | 0 | 0 | 17.6 | 16.12 | 109.2 | |
| .3265 | .1014 | .5721 | 0 | 0 | 0 | 0 | 0 | 17.55 | 15.72 | 111.7 | |
| .1598 | .03792 | 0 | 0 | 0 | 0 | 0 | .8023 | 16.41 | 10.53 | 155.8 | |
| .1319 | .02403 | 0 | 0 | 0 | 0 | 0 | .8441 | 16.36 | 10.37 | 157.7 | |
| .09544 | 0 | 0 | .04273 | 0 | 0 | 0 | .8618 | 16.27 | 10.23 | 159 | |
| (*).0753 | 0 | 0 | .05744 | 0 | 0 | 0 | .8673 | 16.24 | 10.22 | 158.9 | (*) |

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E = Portfolio return

S = Portfolio standard deviation

(*)=Minimum risk portfolio

Table 10b

## COMPOSITION OF EFFICIENT PORTFOLIOS

### Period: 79 IIQ - 85 IVQ

BASIS CURRENCY: U.S. $

EFFICIENT PORTFOLIOS FRONTIER

| | YEN | D.M. | FR.FR. | STG.P. | D.GLR. | SDR | ECU | LIRA | E | S | E/S (%) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (*) | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 7.443 | 10.17 | 73.22 | |

BASIS CURRENCY: YEN

EFFICIENT PORTFOLIOS FRONTIER

| | U.S. $ | D.M. | FR.FR. | STG.P. | D.GLR. | SDR | ECU | LIRA | E | S | E/S (%) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9.723 | 23.55 | 41.29 | |
| | .8051 | 0 | 0 | .1949 | 0 | 0 | 0 | 0 | 8.92 | 20.96 | 42.56 | |
| | .6537 | 0 | 0 | .1664 | 0 | 0 | 0 | .1799 | 8.238 | 19.42 | 42.42 | |
| | .3452 | 0 | 0 | .1005 | 0 | .5543 | 0 | 0 | 7.633 | 18.23 | 41.87 | |
| | 0 | 0 | 0 | .004088 | 0 | .9959 | 0 | 0 | 6.695 | 16.61 | 40.3 | |
| | 0 | 0 | 0 | .02537 | 0 | .9746 | 0 | 0 | 6.672 | 16.58 | 40.23 | |
| (*) | 0 | 0 | 0 | .02341 | 0 | .7055 | 0 | .2711 | 6.29 | 16.38 | 38.39 | (*) |

BASIS CURRENCY: D.M.

EFFICIENT PORTFOLIOS FRONTIER

| | U.S. $ | YEN | FR.FR. | STG.P. | D.GLR. | SDR | ECU | LIRA | E | S | E/S (%) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15.36 | 25.41 | 60.44 | |
| | .9225 | 0 | 0 | .07747 | 0 | 0 | 0 | 0 | 15.01 | 23.89 | 62.85 | |
| | .1221 | 0 | 0 | .05668 | 0 | 0 | 0 | .8212 | 10.97 | 8.074 | 135.9 | |
| | .07976 | 0 | 0 | 0 | 0 | 0 | .3037 | .6165 | 10.36 | 6.37 | 162.7 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | .5643 | .4357 | 9.655 | 4.707 | 205.1 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | .6072 | .3928 | 9.604 | 4.621 | 207.8 | |
| | 0 | 0 | 0 | 0 | .2837 | 0 | .4388 | .2775 | 8.981 | 3.833 | 234.3 | |
| (*) | 0 | 0 | .07843 | 0 | .5147 | 0 | .2374 | .1695 | 8.401 | 3.572 | 235.2 | (*) |

BASIS CURRENCY: FR.FR.

EFFICIENT PORTFOLIOS FRONTIER

| | U.S. $ | YEN | D.M. | STG.P. | D.GLR. | SDR | ECU | LIRA | E | S | E/S (%) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 19.96 | 27.98 | 71.34 | |
| | .8922 | 0 | 0 | .1078 | 0 | 0 | 0 | 0 | 19.45 | 25.88 | 75.15 | |
| | .8463 | 0 | 0 | .1055 | 0 | 0 | 0 | .04815 | 19.2 | 24.89 | 77.14 | |
| | .2228 | .05046 | 0 | .06615 | 0 | 0 | 0 | .6605 | 15.79 | 12.65 | 124.7 | |
| | .1404 | .06239 | 0 | 0 | 0 | 0 | .3367 | .4605 | 14.95 | 10.28 | 145.5 | |
| | 0 | .06529 | 0 | 0 | 0 | 0 | .6438 | .2909 | 13.87 | 7.833 | 177.1 | |
| | 0 | .02684 | 0 | 0 | 0 | 0 | .9732 | 0 | 13.49 | 7.49 | 180.2 | |
| (*) | 0 | .02327 | 0 | 0 | 0 | 0 | .9767 | 0 | 13.49 | 7.49 | 180.1 | (*) |

BASIS CURRENCY: STG.P.

EFFICIENT PORTFOLIOS FRONTIER

| | U.S. $ | YEN | D.M. | FR.FR. | D.GLR. | SDR | ECU | LIRA | E | S | E/S (%) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16.35 | 28.58 | 57.22 | |
| | .9322 | .06775 | 0 | 0 | 0 | 0 | 0 | 0 | 16.06 | 27.6 | 58.2 | |
| | .5917 | 0 | 0 | 0 | 0 | .4083 | 0 | 0 | 15.06 | 24.48 | 61.5 | |
| | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 13.18 | 19.47 | 67.69 | |
| (*) | 0 | 0 | 0 | 0 | 0 | .2253 | .7747 | 0 | 10.77 | 16.95 | 63.53 | (*) |

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E = Portfolio return

S = Portfolio standard deviation

(*)= Minimum risk portfolio

Table 10b

CONTINUED

BASIS CURRENCY: D.GLR.

EFFICIENT PORTFOLIOS FRONTIER

| U.S. $ | YEN | D.M. | FR.FR. | STG.P. | SDR | ECU | LIRA | E | S | E/S (%) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15.89 | 26.51 | 59.97 | |
| .9023 | 0 | 0 | 0 | .09772 | 0 | 0 | 0 | 15.46 | 24.53 | 63.01 | |
| .08959 | 0 | 0 | 0 | .08213 | 0 | 0 | .8283 | 11.31 | 8.03 | 140.8 | |
| .02771 | 0 | 0 | 0 | 0 | 0 | .4452 | .5271 | 10.43 | 5.531 | 188.5 | |
| 0 | 0 | 0 | 0 | 0 | 0 | .538 | .462 | 10.18 | 4.893 | 208 | |
| 0 | 0 | 0 | 0 | 0 | 0 | .551 | .449 | 10.16 | 4.857 | 209.2 | |
| 0 | 0 | .2457 | 0 | 0 | 0 | .4548 | .1995 | 9.482 | 3.517 | 269.6 | |
| 0 | 0 | .5948 | .1251 | 0 | 0 | .2802 | 0 | 8.879 | 3.013 | 294.7 | |
| (*) 0 | 0 | .614 | .1334 | 0 | 0 | .2526 | 0 | 8.851 | 3.011 | 293.9 | (*) |

BASIS CURRENCY: SDR

EFFICIENT PORTFOLIOS FRONTIER

| U.S. $ | YEN | D.M. | FR.FR. | STG.P. | D.GLR. | ECU | LIRA | E | S | E/S (%) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12.86 | 12.22 | 105.2 | |
| .905 | 0 | 0 | 0 | .09504 | 0 | 0 | 0 | 12.45 | 10.21 | 122 | |
| .8372 | .04253 | 0 | 0 | .1202 | 0 | 0 | 0 | 12.16 | 8.92 | 136.3 | |
| .4695 | .08624 | 0 | 0 | .1064 | 0 | 0 | .3378 | 10.42 | 2.35 | 443.3 | |
| .4391 | .09016 | 0 | .1114 | .09781 | 0 | 0 | .2616 | 10.05 | 1.938 | 518.8 | |
| (*) .4366 | .09112 | 0 | .1118 | .09454 | 0 | .0158 | .2501 | 10.02 | 1.935 | 517.7 | (*) |

BASIS CURRENCY: ECU

EFFICIENT PORTFOLIOS FRONTIER

| U.S. $ | YEN | D.M. | FR.FR. | STG.P. | D.GLR. | SDR | LIRA | E | S | E/S (%) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 17.62 | 24.95 | 70.62 | |
| .7849 | 0 | 0 | 0 | .2151 | 0 | 0 | 0 | 16.64 | 20.38 | 81.64 | |
| .1419 | 0 | 0 | 0 | .1916 | 0 | 0 | .6665 | 13.23 | 6.961 | 190 | |
| .04212 | 0 | 0 | .3193 | .1736 | 0 | 0 | .465 | 12.1 | 3.726 | 324.7 | |
| 0 | 0 | .1815 | .3798 | .1594 | 0 | 0 | .2792 | 11.36 | 2.386 | 476 | |
| (*) 0 | 0 | .2585 | .4201 | .151 | 0 | 0 | .1704 | 11.11 | 2.253 | 493.1 | (*) |

BASIS CURRENCY: LIRA

EFFICIENT PORTFOLIOS FRONTIER

| U.S. $ | YEN | D.M. | FR.FR. | STG.P. | D.GLR. | SDR | ECU | E | S | E/S (%) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 22.29 | 24.95 | 89.36 | |
| .8152 | 0 | 0 | 0 | .1848 | 0 | 0 | 0 | 21.4 | 21.16 | 101.2 | |
| .7556 | .03352 | 0 | 0 | .2109 | 0 | 0 | 0 | 21.13 | 20.17 | 104.8 | |
| .3771 | .04321 | 0 | 0 | .03805 | 0 | 0 | .5416 | 18.31 | 10.52 | 174 | |
| .3152 | .04159 | 0 | .05583 | .0182 | 0 | 0 | .5692 | 17.81 | 8.974 | 198.4 | |
| .1792 | .0176 | 0 | .08913 | 0 | 0 | .2183 | .4958 | 17.51 | 8.114 | 215.8 | |
| .08854 | 0 | 0 | .1418 | 0 | 0 | .3539 | .4157 | 17.27 | 7.455 | 231.7 | |
| 0 | 0 | 0 | .2278 | 0 | 0 | .4137 | .3585 | 16.81 | 6.307 | 266.6 | |
| (*) 0 | 0 | 0 | .418 | 0 | 0 | .1776 | .4044 | 15.86 | 5.143 | 308.3 | (*) |

---

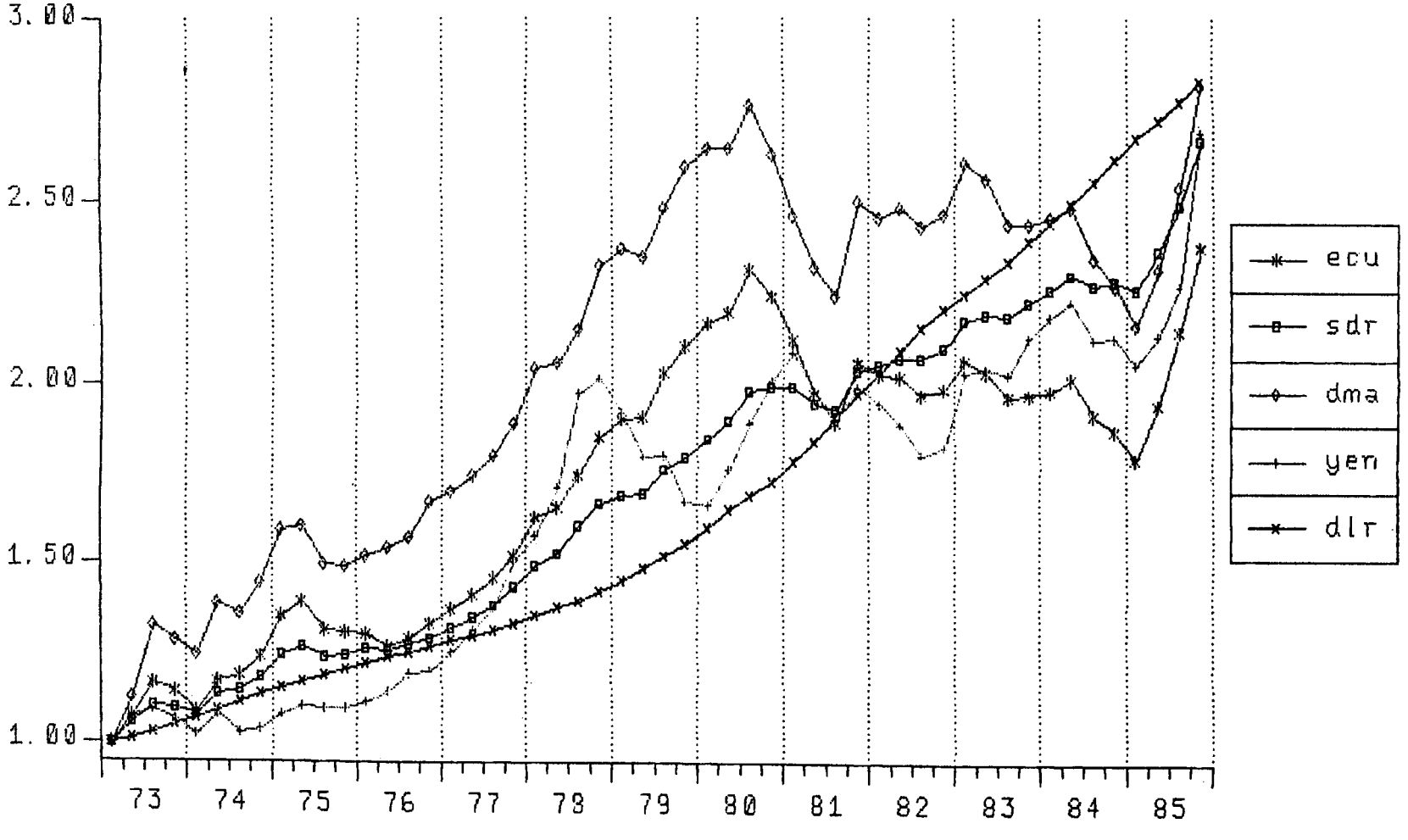
E = Portfolio return

S = Portfolio standard deviation

(*)= Minimum risk portfolio

Chart 1

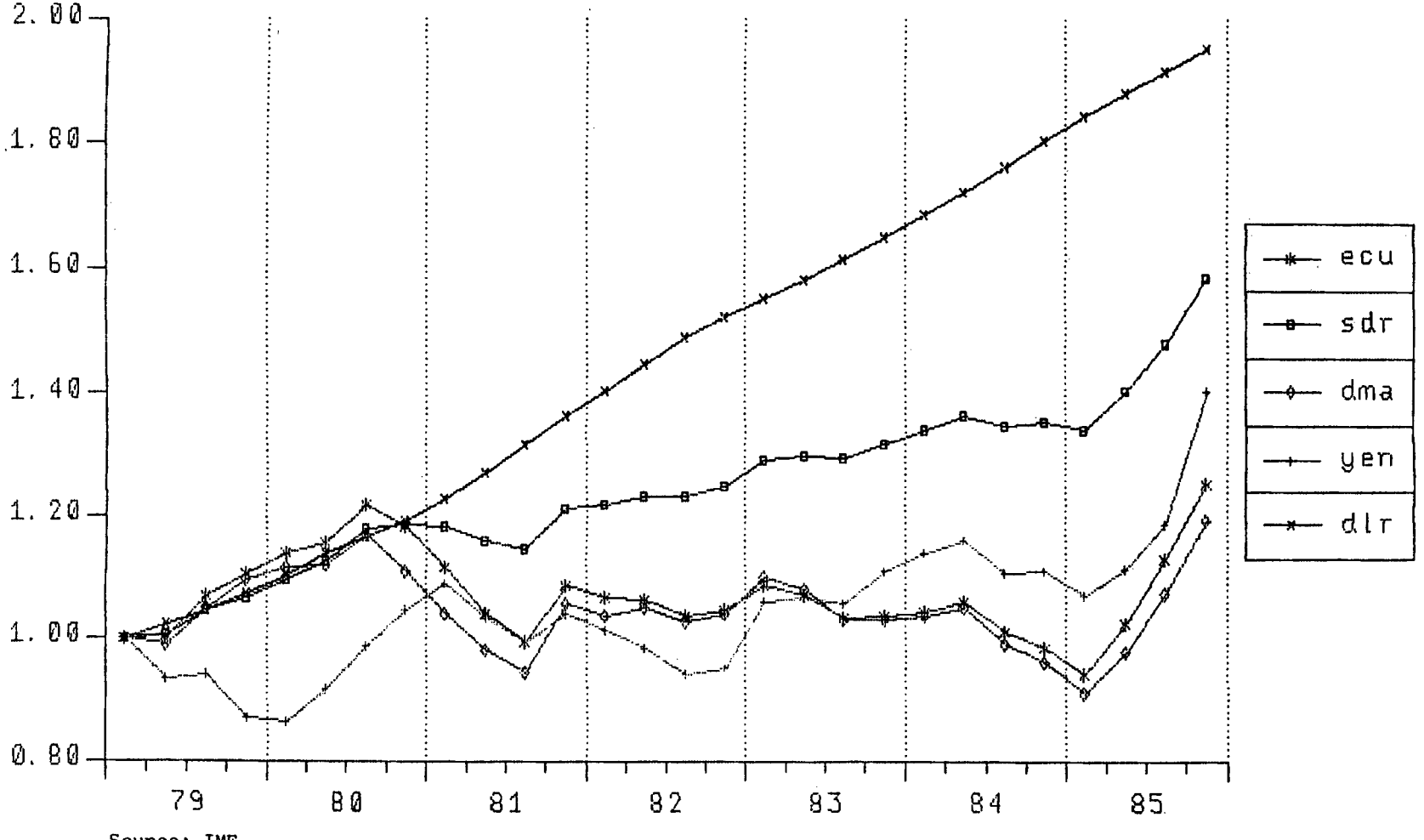
Compounded return in dollar terms of money-market investments
in different currencies: starting period 1973, 1st quarter
(based on quarterly averages)




Source: IMF

Chart 2

Compounded return in dollar terms of money-market investments
in different currencies: starting period 1979, 1st quarter
(based on quarterly averages)




Source: IMF,

Chart 3

# BASIS CURRENCY: LIRA - EFFICIENT PORTFOLIOS FRONTIER

PERIOD: 79 IIQ - 85 IVQ

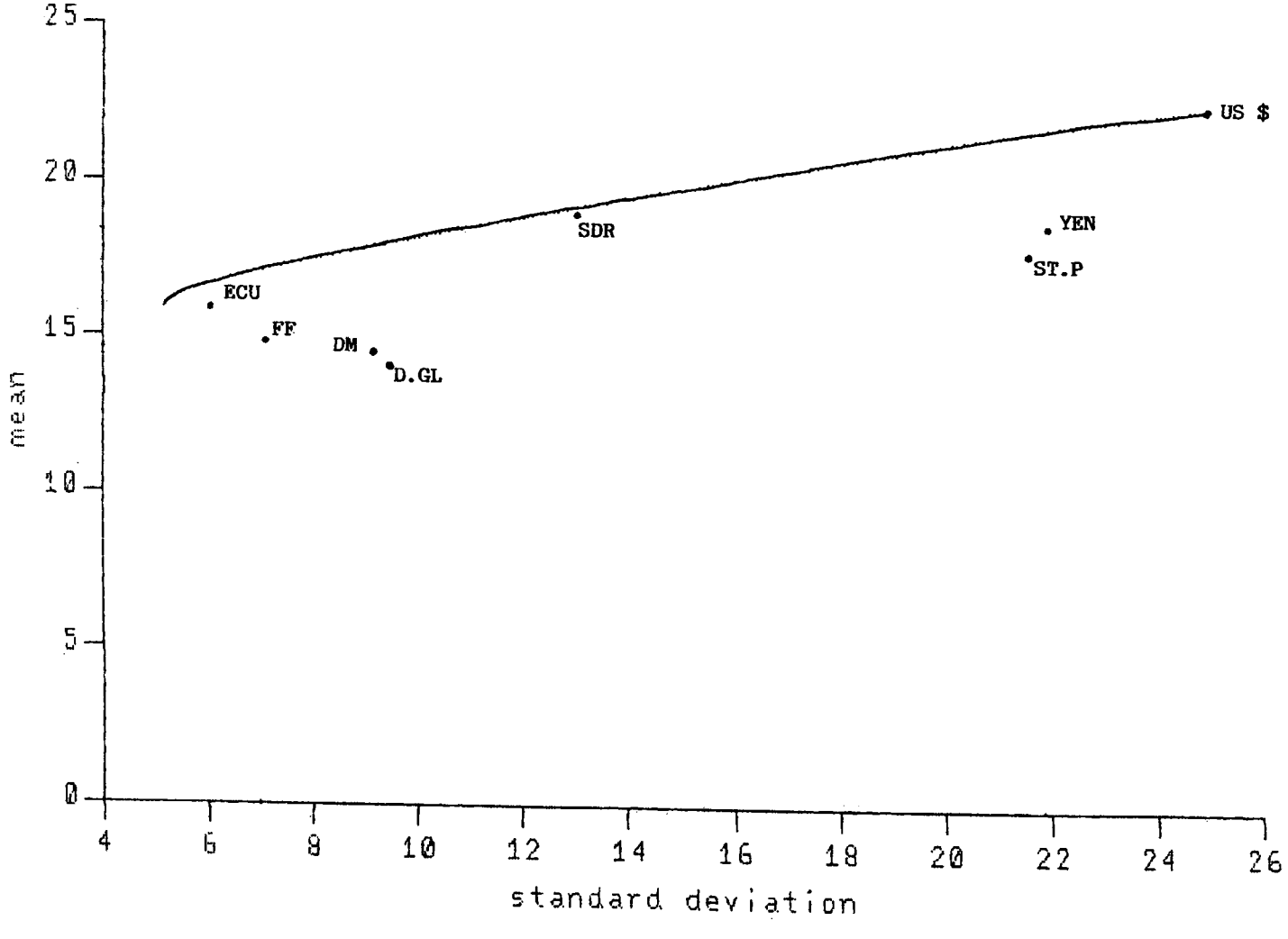
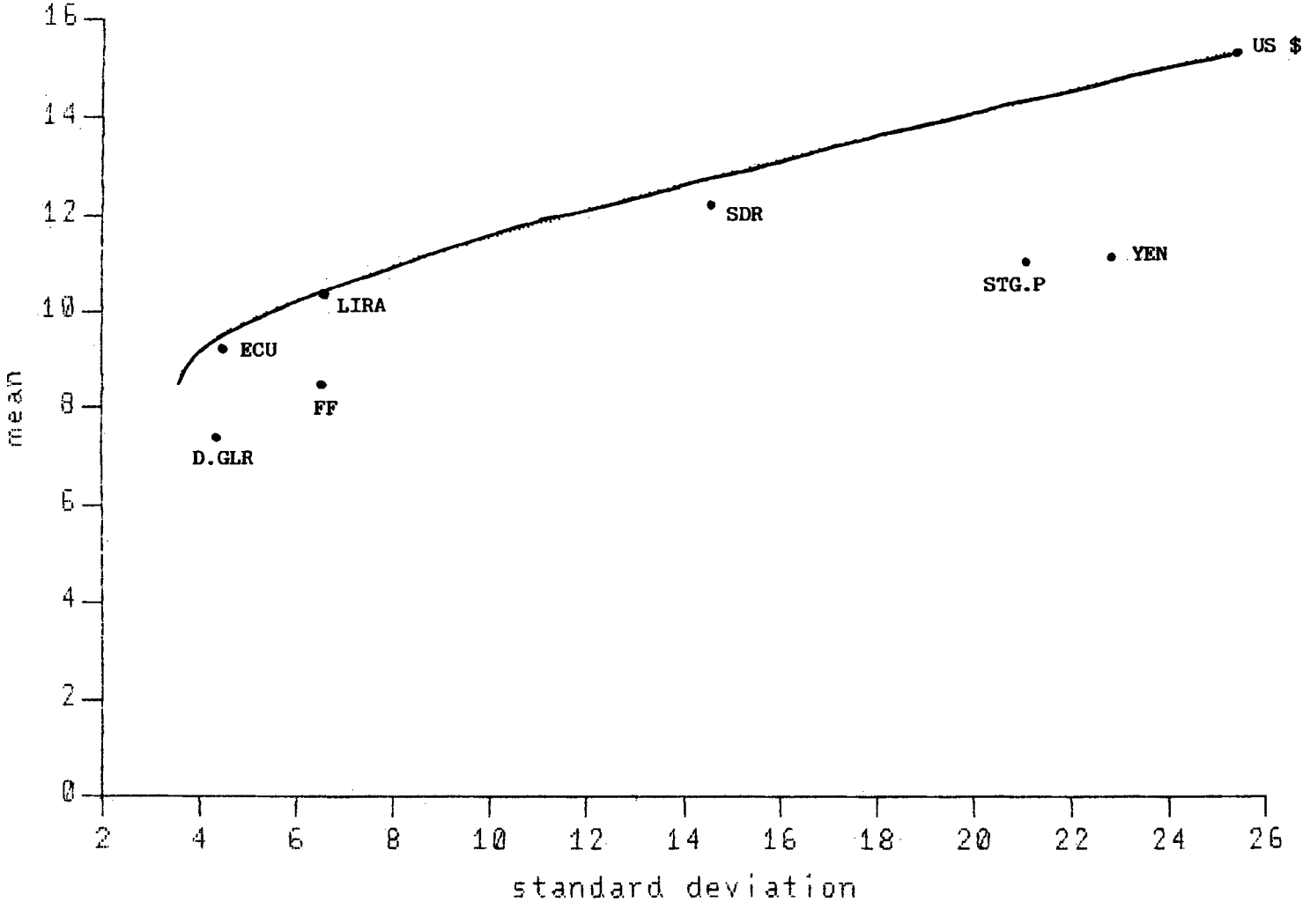


Chart 4

# BASIS CURRENCY: D.M. - EFFICIENT PORTFOLIOS FRONTIER

PERIOD: 79 IIQ - 85 IVQ



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