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Working Paper No. 30

NEGLECTED ASPECTS
OF THE PARALLEL-CURRENCY APPROACH
TO EUROPEAN MONETARY UNIFICATION

by

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1. Why a European Parallel Currency?

1.1. Roads to Monetary Union

Ever since the late 1960's when the aim of European monetary unification became the object of Community ambitions, official thinking on the subject has been dominated by the idea that monetary union must be brought about through coordination of national economic policies.

Three variants of this coordination strategy can be distinguished:

- The first approach might be called exchange-rate unification. The idea is to gradually reduce the variability of exchange rates between the currencies of the EC member countries by narrowing the margins of fluctuation and/or by restricting the scope for parity adjustments.
- The second variant of the coordination strategy aims directly, i.e. ex ante, and exclusively at the harmonisation of demand management.
- Thirdly, some have considered it possible and desirable to find a compromise between those two strategies, i.e. they insist on simultaneous commitments with regard to both the harmonisation of demand management and the restriction of exchange-rate variability.

The alternative to the coordination strategy is the centralisation strategy. The centralisation strategy has received little attention so far because centralisation has been considered to be the probable outcome of coordination. Centralisation has been regarded as the step that could follow successful coordination of national economic policies rather than as a strategy that could make discretionary coordination between the member governments unnecessary from the start.

As in the case of the coordination strategy, there are three roads to centralisation:

- The first and most obvious approach might be called the big-leap solution. Its adherents insist that there is no point in taking first steps towards monetary unification as long as centralisation of monetary policy at the Community level is not wanted by all member governments. If, however, by some lucky coincidence, a political constellation developed that permitted such centralisation, the national member currencies should be replaced by a Community currency at once and completely. While the coordination approach can be compared to market collusion, aiming either at a price cartel (exchange-rate unification) or at a quantity cartel (harmonisation of monetary expansion) or both (simultaneous commitments), the big-leap version of the centralisation strategy can be viewed as *uno actu* monopolisation (currency merger).
- The opposite approach, implying free competition and trade of currencies, is the intercirculation approach to monetary unification: all member currencies are admitted for use in all member countries and no member currency has to be used or even be accepted as legal tender in any one member country unless the partners to a contract have chosen it as their standard of value. Since only the most useful currency is likely to survive in the long run, centralisation of monetary policy is brought about by the market mechanism.
- Finally another compromise solution might be envisaged: the parallel-currency approach: not all member currencies are to compete with each other, but one currency is to compete with all of them. Thus only a duopoly is admitted. The parallel currency may be either one of the member currencies or a newly created Community currency. If it is more useful than the purely national currencies, it will gradually displace them.

What are the criteria by which a choice between these options can be made?

1.2. The Economics of Economic Policy Coordination:

A Critique of the Traditional Approach

Experience with coordination of national economic policies as envisaged by the Werner Report has been spectacularly disappointing.

In the past, criticism of the coordination strategy has concentrated almost exclusively on its first variant: exchange-rate unification. To restrict the permissible scope of exchange-rate variations without previous harmonisation of national demand management, it has been pointed out, is to risk one of the following outcomes:

- If the surplus countries remain prepared to support the agreed exchange rate by purchasing the currencies of the EC deficit countries in the exchange market, each member state will be encouraged to expand the supply of its currency as much as possible in order to maximise its national seigniorage the government that follows the most expansionary monetary policy will then determine the pace of inflation in the whole Community.
- Alternatively, if the surplus countries are not prepared to accept imported inflation and the accumulation of overvalued foreign exchange reserves at low interest rates indefinitely, they will either resort to restrictions of convertibility with all their negative consequences for the international allocation of capital and ^{the} division of labour; or, inmidst of a speculative crisis, they may give up their resistance to parity adjustment and thus disappoint the expectations of investors who had based their plans on the government's promise to maintain a fixed parity.

It can hence be demonstrated that, owing to its inflationary and/or disintegrative implications, exchange-rate unification alone is likely to prove unmaintainable and/or too costly.

If, instead, demand management by national governments were harmonized ex ante, no economic costs of this sort would have

to be incurred. But the question remains whether such a strategy is practicable. To coordinate economic policies governments need operational targets. If the target is to maintain an agreed exchange-rate vis-à-vis the other member currencies through interventions in the foreign exchange markets, there can be no doubt that technically it can be attained. If, however, coordination is to take place ex ante, it is difficult even to determine on a theoretical basis what sort of monetary and, possibly, budgetary policies would be necessary in order to keep intra-Community exchange rates approximately constant.

Some observers have suggested that a simple money supply rule should be adopted: the difference between the rate of growth of the productive potential and the rate of growth of the money stock should be equal in all member countries in order to equalize their rates of inflation. To attain price stability this difference should then gradually be reduced to zero.

A simple money rule of this sort cannot work unless the relevant income elasticities of demand for money are very similar in all member countries. However, since the average velocity of circulation differs widely between them, it is not probable that it should be approximately the same at the margin. Further, even if an equalisation of the inflationary trends in the member countries could be achieved in this way, cyclical variations in the price level will not be in tune with each other, unless national trade cycles happen to be synchronised. Finally, assuming that even this problem could somehow be solved, there remains the fact that an equalisation of the movements of national domestic price levels may not produce exchange-rate constancy, for the purchasing power parity doctrine will not hold unless

- there are no shifts in the terms of trade due to national differences in the income elasticities of import demand or in productivity increases in the export sector (or, what ^{amounts} to the same, no differences in productivity increases and income elasticities of demand between a country's tradeables and non-tradeables), and
- currency asset preferences remain constant.

Alternatively, it has been suggested that nominal interest rates be equalised in the member countries. But this proposal is not only vulnerable to the standard objection that interest rates are not an appropriate indicator of monetary ease or restrictiveness, it also ignores that, if nominal interest rates were equalised everywhere, the currencies of the capital-scarce member countries would have to appreciate in order to offer a higher real interest rate and thus to attract private capital from the capital-abundant member countries. Real interest rates, on the other hand, must also not be equalised ex ante by governments, but as a result of private capital arbitrage.

The matter is even more complicated when allowance is made for the effects of national budgetary policies. According to the Werner Report, harmonisation of budgetary policy has to include i) the rate of increase of the government share in GNP, ii) the size, and changes in the size, of budget deficits or surpluses, iii) the composition of public expenditure as well as the level of and changes in, the rates of taxation, and iv) the instruments of fiscal policy and budgetary concepts. However, no indication is given as to when the effects on aggregate demand of national budgetary policies can be regarded as harmonised; for, obviously, a complete equalisation of all these variables would appear unnecessary and even unreasonable.

It therefore seems justified to conclude that economic theory cannot provide operational long-term targets, let alone a simple rule for the ex ante harmonisation of demand management in a group of countries which wish to keep the exchange rates between their currencies approximately constant. If the member governments want to achieve some degree of exchange-rate stability, but, for the reasons given, ^{wish} to refrain from large-scale interventions in foreign-exchange markets, harmonisation will have to be not only a matter of ex ante planning but also of almost permanent ad hoc temporising. This has important implications.

As harmonisation becomes a day-to-day business, the number of agreements that have to be negotiated increases proportionately. While exchange-rate unification allows the once-and-(allegedly)

for-all fixing of parities and of margins of fluctuation, direct harmonisation of demand management requires an in finite series of compromises. Given the notorious time constraint faced by political decision makers, this is hardly a promising approach. Moreover, there is the prospect that clashes of national interests come into the open at every occasion; they are widely publicised and arouse nationalist feelings, which makes the process of coordination all the more difficult. The harmonisation approach maximises political friction. And since rules cannot be formulated, no obligations exist which prevent the members from reversing the process of coordination at will.

It is this latter weakness which the proposal for simultaneous commitments in the field of demand management and of exchange-rate policy is designed to remedy. The idea is to secure the irreversibility of any progress that might be made in harmonising national demand policies by reducing the scope for future exchange-rate variability to the same extent. The risks inherent in exchange-rate unification, on the other hand, are to be avoided in that no exchange-rate commitments are to be undertaken unless there is agreement on the harmonisation of demand management.

The adherents of the simultaneous-commitment approach are trying to have the best of both worlds. As usual, however, this means that their proposal suffers from the defects of both approaches of which it is a compromise. To fix parities or to reduce margins on the basis of government agreements to harmonise demand policies is not only to assume that ex ante harmonisation can be sufficient to warrant exchange-rate commitments, but also that the declared will of member governments to take the agreed measures will prevail in the domestic political arena. ^{And} what is more important, since the reduction of exchange-rate variability is to be made permanently irreversible although harmonisation can only be secured for a limited period, the commitment in the exchange-rate field has an entirely different time/horizon than the commitment with regard to demand management. For all these reasons simultaneous commitments of this sort are subject to the same types of objection as outright exchange-rate unification. On the other

hand, if exchange-rate commitments are confined to the very short period ahead for which harmonisation of demand management seems to be secured, they can neither ensure the irreversibility of harmonisation in ^{the} future nor avoid the political friction produced by ad hoc coordination.

If the three variants of the coordination approach are viewed together, their common weakness seems to be a lack of automaticity. This is true in two respects:

- on the one hand, agreements to reduce the scope for exchange-rate variations fail to automatically guarantee harmonisation of demand management just as attempts at ex ante harmonisation fail to automatically promise approximate exchange-rate constancy;
- on the other hand, there is no automatic mechanism inherent in the coordination approach which makes sure that the assimilation of national economic policies will increase over time instead of being reversed.

It is the advantage of the centralisation approach that it can provide for such automaticity.

1.3. Centralisation: The Case for the Parallel-Currency Approach

To substitute a common currency for the national member currencies is to ensure ex ante harmonisation of monetary policy and ex ante "exchange-rate fixity" at the same time.

While exchange-rate unification between a group of equal-sized nations is unlikely to appear irrevocable, the substitution of a common currency makes monetary unification as irreversible as any unification can be; and while exchange-rate unification fails to eliminate all convertibility and exchange-rate risks and the additional costs of exchange and information which are peculiar to foreign currency transactions, the substitution of a common currency creates a currency area in which monetary barriers to trade and factor movements have automatically ceased to exist. What remains is the question whether centralisation of monetary policy is sufficient for currency unification.

Since there is only one monetary policy which ^{is} automatically the same for all member countries, divergencies in demand management can only be due to fiscal policy. However,

experience in existing federal states suggests that such divergencies are not likely to pose a serious problem. A strategy which relies on a centralisation of monetary policy not accompanied by fiscal harmonisation merely implies that fiscal policy does not serve as an instrument of Community demand management.

There remains the problem of divergencies in the real sphere. If, for example, productivity increases at different rates in the various member countries, exchange-rate adjustments can serve a useful purpose. They cannot, it is true, prevent the movement of factors of production to the countries where they enjoy a higher productivity, but a depreciation of currencies of countries in which productivity grows less can help to reduce increases in their real wage level and thus to reduce their level of unemployment. If wage subsidies are to be an instrument of regional policy, the loss of exchange-rate policy could be compensated by the establishment of a regional policy at Community level.

Although currency unification facilitates the movement of private capital to the backward regions and countries, it does not imply a regional policy. Thus the automaticity which it affords does not extend to regional policy. But the same is true for a coordination strategy which confines itself to exchange-rate policy and/or demand management. Moreover, as has been explained, exchange-rate unification is likely to lead to interference with the movement of private capital to the depressed regions.

The big-leap approach has all the advantages of the centralisation strategy but the disadvantage that it lacks gradualism. The case for gradualism is both political and economic. From a political point of view, to transfer all monetary competences from national to Community institutions at one stroke is to maximise the provocation to, and hence the resistance from, the forces of nationalism and conservatism. For just as exchange-rate illusion persists the longer, the more

gradual exchange-rate changes are, so the illusion of national monetary sovereignty can be maintained the better, the more gradual the transfer of competences. The more abrupt the strategy is, the less likely it is therefore to ever be executed. Moreover, if the Community confined herself to waiting for the day X on which a favourable political constellation may permit the big leap forward, it would fail to defend and exploit the - however weak - political impetus for, and commitment to, the goal of monetary unification which have survived the failures of the early seventies.

From an economic point of view, gradualism has the advantage of facilitating adjustment to the future: a gradual evolution can be anticipated more easily so that misallocation due to disappointed expectations can be minimised. No doubt, it is also for this reason that the EC customs union was not established at once, but that tariff reductions were spread over many years. Finally, gradualism offers the economic benefit that some advantages of monetary union can already be enjoyed at a very early stage.

The intercirculation approach observes the principles of both gradualism and automaticity. In a field like money in which economies of scale are of overriding importance, competition tends to produce a "natural monopoly" in a gradual process. The currency that is most useful to private economic agents outcompetes the others; it will spread first in those transactions for which a common European currency is most needed. Moreover, currency competition by itself is likely to reduce the seigniorage profits which the institutions issuing money can earn and which prevent money from being held in optimal quantities; thus the intercirculation approach is no doubt optimal from a microeconomic point of view. From a political point of view, however, this road to currency union may appear most objectionable. Instead of ^{hervorzuholen} fostering

a feeling of European solidarity, it introduces an element of national rivalry. This is also the case, though to a lesser extent, if one national member currency is made a parallel currency in all member countries.

It is for this reason that the creation of a new European Parallel Currency (EPC) has been suggested. For in this way rivalry between national interests would be avoided; what would remain is the inevitable conflict between the national and the Community level, but this would be resolved through the market mechanism rather than political log-rolling. Furthermore, in the present circumstances, the parallel-currency approach is superior to the intercirculation approach in that it ^{the Community} permits to combine the objective of currency unification with the objective of currency reform. It is easier to create a new currency that is better than the old currencies than to stabilise the value of the old currencies. To reduce a given rate of inflation is to risk temporary unemployment because inflationary expectations are slow to adjust and hence real wages and the real rate of interest on fixed-interest liabilities rise above their full-employment equilibrium level.

1.4. Non-Competitive Conceptions of the Parallel Currency Approach

Not all advocates of a European Parallel Currency suggest that it should drive out the national member currencies. Two such non-competitive conceptions may be distinguished.

- The first is to use the parallel currency merely as a pivot for European exchange-rate unification. The idea is therefore not to gradually displace the national member currencies but to facilitate the gradual reduction of exchange-rate variability between them.

- The other non-competitive conception of the parallel-currency approach avoids this problem because it is more modest in scope: the creation of the EPC is considered not as means to monetary unification but as an end in itself. The benefits to be had from its creation are the benefits of replacing the Eurodollar (and the other non-EC eurocurrencies) in intra-Community, and perhaps even in external transactions.

A currency substitution that is confined to non-EC eurocurrencies has great political appeal for the member governments because for them it implies not a sacrifice, but a gain of monetary power. But it would be a purely distributive gain at the expense of non-members: world economic efficiency would not be increased. Since one currency would be added without other currencies being eliminated even in the long run, it is, on the contrary, probable that global transaction costs would grow. Moreover, unless, for some other reason, the EPC were more attractive than non-EC currencies, EC private agents would have to be forced to dispense with the currencies which, according to their revealed preference, serve their purpose best.

Apart from these welfare aspects, there are serious ^{practical} problems. If the holding or intra-Community use of, say, Eurodollars were prohibited to EC residents, they might still prefer to move into a national EC currency rather than into the EPC. Some observers have even predicted that, anyway, one of the national EC currencies is likely to replace the dollar on eurocurrency markets in the near future. In either case, even the creation of a "non-domestic" EPC would be bound to clash with the national interest of one member country. The same would be true if the EPC were more attractive than the dollar. Effective controls would be needed to prevent it from displacing most national member currencies, both in the eurocurrency market and at home.

2. What sort of European Parallel Currency?

2.1. An attractive EPC

2.1.1. Attraction versus Coercion

The simplest way to ensure the acceptance of the EPC is to oblige the users of money to accept it. However, if both the EPC and the respective currency were declared legal or even compulsory tender, the exchange rate between them would have to be fixed; for unless it is stipulated at which rate the EPC has to be accepted (*cours légal*) or used (*cours forcé*), the objection to accept or use it has little meaning in practice. If the exchange rates between the EPC and each national member currency had to be fixed, obviously, the exchange rates between all member currencies would be fixed. In that case, however, the creation of a parallel currency would not substitute, but presuppose, exchange-rate unification; it would lose its *raison d'être*.

This paradox could be avoided if the EPC were prescribed or made legal tender for only some transactions while the national currencies could still be used and might remain legal tender for all other purposes.

Such a procedure would be practicable, but not unobjectionable. For the reasons just given, prohibition and coercion are likely to reduce the efficiency of monetary transactions and calculations. This is the more probable if the law discriminates between types of transactions and thus introduces distortions into the pattern of monetary transactions which run counter to the comparative advantages of the competing currencies.

2.1.2. The Economic Case for "Subsidising" a New Currency

As has been indicated already, the use of money is subject to very sizeable individual and social economies of scale, which act as a barrier to entry for any new currency. From the individual's point of view information cost is the smaller, the fewer standards of value are used; since not only accounts,

contracts etc., but also money as a store of value and as a means of payment are denominated in a standard of value, the individual's information costs are smallest if the same currency serves him as a standard of value, a store of value and a means of payment. Second, the use of only one standard of value protects the individual against exchange-rate risk or the cost of hedging against it, ~~when~~ he uses more than one standard of value. Thirdly, the individual can save costs of exchange and/or of portfolio management (i.e. of information, of hedging and/or exchange risk) by using only one means of payment.

While the information costs described are the higher, the more standards of value are added, but are independent of the number of accounts or contracts denominated in these additional standards of value, the costs of exchange and probably also exchange risk and the cost of hedging and portfolio management are related to the number of transactions in which the parallel standard is used, i.e. they are not fixed but variable costs. Provided that extreme elasticity assumptions are excluded, these costs are explicitly ^{or implicitly} borne by both parties to a contract - they give rise to social economies of scale. The "defection" of an individual from currency domain A to currency domain B implies a redistribution of income from the residents of A to the residents of B, i.e. it creates distributional (or in a different terminology, "pecuniary") externalities. To the extent that it affects the choice of currency by others and consequently the pattern of transactions between them, it will also have secondary external effects. In all these respects, the choice between currencies is comparable to the choice between languages or telephone networks or industrial locations. It is the reverse of the choice between different roads by car drivers where entry implies congestion and thus diseconomies of scale.

The existence of external economies of scale is the basis of the "infant-currency argument" for the subsidisation of a new money. Just as production in locations which offer no linkages with complementary industries is subsidised in the framework of regional policy so as to compensate for the lack of

locational economies of scale, so the EPC may be subsidised to compensate for its lack of (social) transaction economies of scale. However, unless there are specific distributional objectives to be attained, subsidisation cannot be justified on grounds of purely distributional externalities. Only if, as will have to be shown, the EPC is more desirable from a social welfare point of view, i.e. if its use gives rise to real-income (in a different terminology, "technological") externalities that raise micro- or macromonetary efficiency, ought there to be discrimination in its favour.

As a matter of fact, EPC subsidisation would even be justified on these grounds when the EPC is no longer an infant but the most important currency in the Community. The reason is not that at this stage the analogy with an infant industry breaks down but that, strictly speaking, the argument which justifies infant-industry subsidisation is equally applicable to "adult" industries. For to speak of an infant-industry argument is not to argue that "grown-up" industries which produce external real-income economies must not be subsidised, but that they will probably^{be} able to survive without subsidies. In short, subsidisation will still be justified, but it will no longer be necessary.

EPC subsidisation will no longer be necessary when its transaction domain has attained the size of the largest national EC currency domain(s), provided that at this point the national currencies will also have lost their privilege of legal tender. If no party to a contract can dictate to the other the currency in ^{which} debt is denominated and settled and if both currencies enjoy equal economies of scale, competition will show whether a currency that may be used all over the Community is more useful than a national currency which cannot be used in transactions within other member countries.

2.1.3. EPC Privileges for Specific Uses

In accordance with this analysis, some authors have suggested solutions which amount to privileges for specific EPC uses.

If the EPC is prevented from appreciating so as to compensate for these incentives, such measures are likely to be effective. But they have disadvantages. Since they favour some EPC uses more than others, they distort the pattern of transaction costs; for this reason, a uniform subsidy would be preferable. Moreover, most of these privileges serve no other purpose than to compensate for the EPC's lack of economies of scale; they are not desirable in themselves. (Those, on the other hand, which, like the lifting of capital controls, are of intrinsic usefulness could - just for this reason - also be usefully extended to the national member currencies.) In both respects, EPC privileges for specific uses are inferior to an EPC value guarantee.

2.1.4. Value-Maintenance Provisions

2.1.4.1. The Options

For the EPC several types of possible value guarantees can be imagined.

The simplest conception is to fix its value in terms of another currency or monetary asset, for example, in terms of the US dollar, some other non-EC or national EC currency or the SDR.

A second method would be to relate the EPC's value to the value of the group of national EC currencies:

- The EPC could be defined as the sum of fixed amounts of national EC currencies ("fixed-amount basket" or "EURCO formula"); the number of units of each currency in the basket would be calculated so as to give each country's currency a weight corresponding to its share in European trade, GNP, and/or other criteria.
- The EPC could be defined as a basket of variable amounts of national currencies which are adjusted so as to maintain initial weights ("fixed-weight basket" or "par-valuation").

It presupposes that there is an internal or external reference currency or some rule by which one can determine whether a given exchange-rate adjustment

between the national EC currencies is to be interpreted as a revaluation of the appreciating member currencies or as a devaluation of the depreciating member currencies.

- The two basket formulae just described could be used discriminattingly according to whether parities are adjusted upwards or downwards ("asymmetrical basket") : devaluations of national EC currencies could be accompanied by increases in the number of units in the bag, while revaluations would leave the number of currency units in the bag unchanged. If the parity of one or several national EC currencies were adjusted vis-à-vis the others, the EPC's value in terms of these other currencies could rise but not fall. Since in the case of devaluations the asymmetrical basket is equivalent to the fixed-weight basket, it requires - like the latter - the choice of a reference currency or a reference-currency rule.
- If the EPC were made a European pivot currency representing the median of the snake and/or of a gliding parity schedule, this would imply an at least short-term link of the member currencies to the EPC and hence indirectly a sort of value guarantee for the EPC. The margins of fluctuation and/or of exchange-rate gliding can be applied either to an EPC defined by the EURCO formula or according to the par-value approach. In both cases, "central rates" between the national member currencies and the EPC would have to be declared to which the margins could be applied. But while an EPC pivot defined according to the par-value approach would merely be the median of permissible exchange-rate variations, an EPC pivot defined by the EURCO formula would in addition represent the weighted average of the effective values of national member currencies. If the EPC were defined according to par valuation, permitted margins between it and the national member currencies would be half as large as the implied margins between each pair of national member currencies; if the EPC were defined by the EURCO formula, this would only hold if both of the national member currencies concerned had equal weights in

the basket and if no other intra-EC exchange-rate changes occurred that changed the average of the basket.

The third method would be to adopt a rule for changes in the EPC's value vis-à-vis one currency or the group of national member currencies:

- The EPC could be made to offer an EC currency option, i.e. it would be as good as the "strongest" member currency. In that case it would, in principle, be equivalent to the European Currency Unit (ECU), various versions of which have been used on the Eurobond market. However, there is one important difference between a currency option for a bond and a currency option for a currency. A bond is issued at one point in time and for a predefined term. To increase the attractiveness of this bond the issuer merely needs to denominate it in a unit of account that keeps the value of the currency which appreciates most over the whole term of the bond. A currency is issued continuously and, hence, has to be kept attractive continuously. If, in these circumstances, the member currency that has appreciated most in the past were expected to depreciate for some time in the future, the EPC would be temporarily as unattractive as this member currency regardless^{of} whether its depreciation were expected to be more or less than its appreciation in the past. Thus, from time to time, there would be speculative shifts out of the EPC whenever the hitherto strongest member currency were expected to depreciate. These shifts could be kept the smaller, the more frequently the guaranteed conversion rates between the EPC and the national member currencies which underlie the currency option were adjusted to prevailing market exchange rates. In that case, however, the EPC would probably be far "stronger" than the "strongest" member currency.
- Rather than offering a direct value guarantee, the EPC Bank could stipulate in advance that the EPC money supply would increase at a more modest rate than the money supply of any member currency.

- The EPC's value could be kept stable in terms of weighted EC purchasing power. Most conveniently, the EPC would be defined as a basket of weighted amounts of the national member currencies that would each be increased whenever, and by the same percentage by which, the cost-of-living index rose in the respective member country (indexed basket).
- The EPC could be defined as a basket of weighted amounts of the national member currencies that would each be increased by the rate of interest on investments of similarly low risk and high liquidity, deductions being made for the cost of producing and policing the EPC (no-seigniorage basket).

This list of optional value-maintenance provisions is not exhaustive. It contains only the most promising suggestions that have been made. Moreover, it is worth mentioning that any parity guarantee may be combined with any guarantee as to the margins of fluctuations and that an internal value guarantee may be combined with an external value guarantee, provided member governments are willing to bind themselves in this way. For example, the EPC may at the same time use the SDR (defined as an international basket of currencies) as a pivot and itself serve as a EURCO-type pivot for the EC member currencies. In this case exchange-rate variations between the currencies in the SDR basket might oblige the EC member countries to intervene in the exchange markets so as to keep their currencies within the agreed margins around the basket of fixed amounts of EC member currencies as which the EURCO-type EPC would be defined.

2.1.4.2. Characteristics of an Optimal EC Standard of Value

A standard of value is the more useful both from an individual and from a social point of view, the more it reduces information cost and risk. While information cost matters most for accounting, risk is the main criterion by which the usefulness of a contract unit will be judged. In both respects a standard of value is the more desirable, the more stable and predictable its value in terms of both fluctuations and permanent changes.

While information cost is affected only by the frequency of value variations, risk depends only on their size.

2.1.4.2.1. Minimising the Cost of Information about Exchange-Rate Changes

Exchange-rate adjustment between the national EC currencies would imply the lowest information cost for EPC users if the EPC were defined on the par-valuation approach with zero margins of fluctuation. This is because, for example, the revaluation of one member currency would then be accompanied by a proportionate reduction of the number of units of this currency contained in the fixed-weight basket and would hence not affect the exchange rates between the EPC and the other member currencies. Information cost would be the highest if the EPC offered no direct value guarantee but only a money-supply guarantee, so that shifts in demand would affect its value and hence exchange-rates (scarce-money rule). It would also be high if the revaluation of one member currency affected exchange rates between the EPC and all member currencies as would notably be the case if the EPC were defined on the EURCO formula, as an indexed basket, a no-seigniorage basket or in terms of the SDR, and the frequency of such exchange-rate changes would tend to be the higher, the more currencies in the basket. Somewhere in the middle lie a

number of solutions which combine two of these extreme solutions (e.g. the asymmetrical basket) or which imply a permanent or conditional link to one currency (e.g. a link to the dollar, an EC currency option, indexation on one national currency) and hence have different consequences for information cost depending on the currency which is revalued.

While it is clear that a par-valuation approach for the EPC minimises information costs when the exchange rate of one member currency changes, this conclusion need not hold when several currencies are involved. Assume that the majority of member currencies is revalued vis-à-vis the rest. According to the simple par-valuation approach which has been described the EPC would devalue vis-à-vis the majority of member currencies, but would maintain its exchange rate vis-à-vis the remaining minority. This is because simple par-valuation links the EPC to the currencies of those member countries whose exchange-rate "policy" is of a purely passive nature. Since such a link is entirely arbitrary from an economic point of view, the simple par-valuation approach might be complemented by a majority rule so that the minimisation of information costs continues to be ensured. The information costs that have to be borne by EPC users whenever the parities of member currencies are adjusted are the higher, the greater the number of EPC affected users; to minimise the total information costs of parity changes it would thus be necessary to use the number of EPC users in each member country as weights in determining whether a majority or a minority has changed its parity. Alternatively, if this is too cumbersome, member currencies may be weighted according to the number of prospective EPC users resident in the respective member country, say, according to the country's share in intra-Community trade and capital transactions. The adoption of some sort of majority rule would also prevent the par-valuation approach from becoming inoperable when all member countries abandoned their parities and started floating; the EPC's

value would be linked to the member currency with the largest weight.

While majority par-valuation would minimise the cost of information about exchange-rate changes between the national member currencies and the EPC, it would fail to distribute it in equal proportions between the member countries. Since the nature and sequence of future exchange-rate changes cannot be predicted with sufficient certainty, this bias in favour of the Community majority cannot be compensated by a corresponding ex ante bias in favour of the Community minority when contract prices are fixed. Nevertheless, this bias could be justified if (at least) the majority of member governments agreed and actually managed to harmonise their demand policies so as to ensure exchange-rate constancy between their national currencies. It would serve as an incentive to aim at the majority rate of inflation. Thus the par-valuation approach is a typically Wernerian conception. However, if the majority missed the coordination target by the same degree or if no obligatory coordination targets existed at all (as is presently the case), majority par-valuation and hence the minimisation of information cost would be incompatible with distributional justice. In these cases it would be the fairest solution if the EPC's value were linked to the member currency which came nearest to the objective of price stability.

Although the minimisation and a fair distribution of the information costs involved in EPC exchange-rate adjustments vis-à-vis the national member currencies may require different solutions, the dilemma that arises does not seem serious. The reason is that the cost of calculating and communicating the new EPC exchange rates can be considered negligible, however complicated the formula used to define the EPC's value may be and however often exchange rates may change. For those who find this calculation too costly, the Statistical Office of the EC Commission could publicise the exchange rates between the EPC and the member currencies on a daily or even hourly basis.

2.1.4.2.2. Hedging against the Risk of Exchange-Rate Changes

More important than the information cost of using the additional currency as a standard of value are the risks involved. A risk-averse EC resident who faces, for example, a net obligation (liabilities and expenditure) denominated in his national currency will prefer claims (assets and income) denominated in the same currency to claims denominated in another currency or unit like the ECU. And he will wish to hedge in a corresponding way if he disposes of net assets denominated in his national currency. While exchange risk is a barrier to the use of any new standard of value in domestic transactions, this need not be ^{the case} for contracts between the residents of different currency domains in which exchange risk is impossible to avoid unless foreign currency claims are matched with foreign currency obligations and vice versa. If the partners to an international contract want to spare the cost of such hedging and if they face the same ^{progressively} increasing disutility as risk increases (progressive risk aversion), the total cost of the risk is minimised when it is shared by them in equal parts. Thus risk, unlike information cost, tends to be minimised and distributed fairly by the same standard of value.

The analysis so far suggests that for bilateral international contracts (which are the usual case) the ideal standard of value is a basket containing only the two national currencies concerned at equal weights. But the implication of this solution would be that there ought to be as many (bilateral) standards of value as there are pairs of currencies (i.e. $\frac{n!}{2(n-2)!}$), e.g. 36 in intra-EC relations ($n = 9$). The number of standards involved indicates that a system of purely bilateral baskets would suffer from considerable diseconomies of small scale. This is particularly relevant to the Eurobond market where substantial costs can be saved by offering one bond issue to a number of different nationals.

Thus, from the point of view of exchange risk and scale economies combined, a EURCO-type EPC which takes part of the risk from everybody and which is weighted according to the share of each member country in international intra-Community transactions (as an approximation to the risk suffered by its residents) should not only be attractive and useful for multilateral institutions like the EC Commission and for multinational companies and others having net claims/obligations in a multitude of EC member currencies, but for bilateral contracts as well.

This comes out particularly clearly if the EURCO-type formula is compared with majority par-valuation. For example, there may be a series of independent devaluations of all national member currencies except one; or in a system of general floating the member currency with the greatest weight may appreciate vis-à-vis the rest. In both cases an EPC defined according to majority par-valuation would follow the strongest currency and, hence, get out of line with the others. It would not only fail to guarantee an approximately even distribution of exchange risk for the users of the weaker currencies, it would actually imply a greater exchange risk than their national currencies. A EURCO-type EPC, on the other hand, would undergo the weighted average rate of depreciation of the member currencies and thus be much less likely to depreciate either more or less than both of any two national member currencies.

But apart from this risk, economies of scale and the distribution of information cost there is a further aspect that strongly points in favour of using some sort of multi-currency basket as an EC standard of value.

2.1.4.2.3. Currency Diversification: Reducing the Risk of
Fluctuations in the Rate of Inflation and of
Real Exchange-Rate Changes

An individual who does not have substantial net obligations or claims denominated in his national currency and who therefore does not have to fear the use of more than one standard, will seek for a standard of value that protects him against fluctuations in the rate of inflation and in real exchange rates to which monetary standards tend to be subject. One way of aiming at protection of this sort is to create larger currency areas, another to employ a multicurrency standard, i.e. to reduce the fluctuation in rates of inflation and real exchange rates by averaging them. The optimal standard on this account would be a basket of fixed amounts of all existing currencies; for the greater diversification, the more likely is the law of large numbers to produce some degree of stability in the basket rate of loss of purchasing power.

However, this reasoning is based on two somewhat restrictive assumptions. First of all, it supposes that there are no specific expectations as to the rates of inflation and real exchange-rate changes of individual currencies. This assumption need not hold. For example, it might be expected that on the average non-EC countries tend to experience wider fluctuations in their rates of inflation and their terms of trade than the member countries. In this case it would be rational to include mainly or only Community currencies in the basket. Second, this conclusion is based on the assumption that all real exchange rates are equally relevant for the residents of the EC member countries. This assumption is unrealistic. The risk of real exchange-rate changes will be the less for an EC resident, the more closely the composition of the basket standard of value conforms to the pattern of his foreign trade and capital transactions. For the Community as a whole this means that the EPC basket should contain mainly national

EC currencies and that these should be weighted according to the respective member country's share in the Community's internal and external foreign trade and capital transactions. Allowing for these two aspects, a standard of value, defined as a basket of member currencies only, may not be as far from the optimum as it might seem at first.

To the extent that EC residents try to reduce risk through diversification they are interested in an averaging device that is entirely automatic and unbiased. For only in this case will the law of large numbers work. This means that in particular any basket whose composition is arbitrary or may be altered at the discretion of governments fails to reduce the risk of random currency fluctuations by as much as a predictable automatic formula could do.

2.1.4.2.4. Eliminating the Risk of Inflation and of Nominal Exchange-Rate Changes and Reducing the Risk of Real Exchange-Rate Changes: The Indexed Basket

When a standard of value that loses purchasing power at a more stable rate than its competitors is more attractive than they are a standard of value that conserves its purchasing power must be even more attractive. The indexed basket is such a standard of value. From the point of view of protection against inflation it is more useful than a EURCO-type basket in two respects: it reduces the inflation risk by guaranteeing not only a more stable but a constant rate of inflation, and it reduces the cost of information about the purchasing power to which it is equivalent by guaranteeing that this constant rate of inflation will be zero. Thus it eliminates all risks of inflation and, by definition, of purely nominal exchange-rate changes. While the EURCO-formula is only a device for distributing the total risk of nominal and real exchange-rate changes in such a way that its total disutility is minimised, the indexed basket permits its users to reduce the total risk by confining it to real exchange-rate changes and to distribute this remaining risk in the same way as the EURCO-formula does. This can be shown as follows.

If exchange-rate changes merely compensated for differences in national rates of inflation, the purchasing power of the amounts of each member currency in the indexed basket would remain constant, either because there would be no inflation in the member country concerned or because the number of units of its currency in the basket would be increased by the country's rate of inflation. In these circumstances, an EC resident who had his income denominated in an indexed-basket EPC and spent it exactly on the representative basket of commodities to which the indexed basket amounts (see p.23) would dispose of the same purchasing power regardless of the country in which he earned his income, in which currency he denominated his purchase contracts and which rate of inflation prevailed for his national currency. On the other hand, if for instance the terms of trade of one member country improved vis-à-vis the others, its currency would appreciate vis-à-vis the others even if the rates of inflation were the same in all member countries, and the purchasing power of the amounts in the basket of this currency would actually increase if they were used for expenditure in the countries whose terms of trade had deteriorated. Thus an EC resident whose income were denominated in EPC would lose purchasing power to the extent that he spent more of it in the gaining country than its currency had weight in the basket, or he would gain to the extent that he spent more of it in the other (losing) countries than their currencies had weight in the basket. More generally speaking, the weights which each member currency obtained in the basket would determine to which extent the basket's constant purchasing power would be defined in terms of which country's commodities and hence how the remaining real exchange risk is distributed.

There is one type of risk which the indexed basket fails to eliminate or to reduce: the risk inherent in the use of more than one standard of value. Indeed, if inflation continued in the countries of the Community as may be expected, the

indexed-basket EPC would be likely to appreciate in the long run even vis-à-vis the "strongest" national member currency, i.e. it would get entirely out of touch with the national currencies. However, as has been explained in Section 2.1.4.2.2., the risk of using more than one standard of value does not matter unless there are net claims or net obligations denominated in the national member currencies against which the individuals concerned wish to hedge. Since such contracts will expire sometime in the future, this risk will only be felt during a transitional phase. In the new contracts to be concluded, ultimate consumers will be attracted by the indexed standard of value which protects their income and savings against loss of purchasing power, and producers will be eager to denominate all contractually fixed payments to factors of production (wages, interest) in a standard of value which ensures that the nominal amounts of their payments will be affected by changes in the price level in just the same way as the receipts they obtain from their sales. Moreover, multinational EC companies may wish to use the indexed standard of value as a unit of account in profit and loss accounting, because it permits them to value capital goods and inventory more nearly at their replacement costs rather than at their historical cost and thereby to avoid the calculation of illusory profits.

The indexed basket would be a particularly useful unit of account for the EC Commission and the other Community institutions: at last budget contributions, development aid, regional aid, direct agricultural subsidies, duties, taxes, fines etc. could all be fixed in real terms. It could also conveniently be used by the European Fund for Monetary Cooperation to denominate credits to member central banks and by the European Investment Bank to denominate its borrowing and lending, as well as by the Coal and Steel Community, the Statistical Office of the Commission, the European Court of Justice and in treaties with non-member countries. If the present system of agricultural price support

deserved to be continued, it would even be logical to fix support prices in real terms as some farmer associations have demanded. Surprising though it may be, the dozen or so different units of account that are presently employed by the Community could all be usefully replaced by the indexed basket. Depending on the purpose of the unit, it would still be possible to differentiate as to the frequency of recalculating the unit's national currency equivalents. Where daily adjustments of conversion rates create administrative difficulties, longer adjustment periods or adjustment thresholds could be defined. Infact, this is already current practice with the existing units of account and probably inevitable as long as exchange-rate fluctuations persist. It is also conceivable that different currency weights would be used for different purposes, according to the currency pattern of contributions and of expenditure in the case of the budget, the regional fund and the Coal and Steel Community, and according to the pattern of contributions only in the case of the Development Fund, the European Investment Bank and the European Fund for Monetary Cooperation. Whether uniformity or diversity of weights is more efficient depends on the relative importance of information costs as compared with the risk of real exchange-rate changes.

As a private unit of contract and account, the indexed-basket standard of value would have to compete with index clauses confined to the national cost-of-living index or even more specific provisions where such clauses are permitted. But if the private sector needs some sort of an EC standard of value at all, it should be most interested in a standard like the indexed basket, which reduces not only the risk of real exchange-rate changes, but also eliminates the inflation risk. Were it not for inertia, the transitional desire to hedge open positions in the existing currencies and notably the high diseconomies of small scale in information cost that act as a barrier to the use of a new standard of value, the market

would have already been using the indexed-basket standard ^{for} years. Since it has not, the Community institutions may have to lend it a helping hand by adopting it as their unit of account.

2.1.4.2.5. Maintainability of Value Guarantees

A standard of value is the more useful, the longer it promises to be applicable. In the case of the EPC, there are two reasons why the value guarantee to which it is subject may not be maintainable indefinitely.

The first problem is that all value guarantees using basket formulae (except for the par-valuation approach) may gradually lose their relevance as exchange-rate changes alter the real weights of the member currencies in the basket. This danger is most serious with a EURCO-type formula whose weights will be affected by both real and nominal exchange-rate changes. The weights of the indexed basket, on the other hand, are only altered by real exchange-rate changes, i.e. those which do not compensate for divergencies between national inflation rates. However, it is not difficult to readjust weights from time to time, either at regular intervals or whenever the departure from initial weights or from current shares in intra-Community trade and capital transactions has reached a certain predefined size. Once the EPC has prevailed in international intra-Community transactions, weights may also be oriented more towards the share which each member country has in Community GNP so that the EPC's usefulness for domestic national transactions is increased. Weights can be adjusted while the external value of the EPC, say, in terms of the SDR, remains constant; the adjustments will entail minor changes in exchange rates between the EPC and the national member currencies, but not among the national member currencies themselves.

If one of the national member currencies were driven out of circulation and were not reissued, it would, of course, drop out of the basket; to maintain the EPC's value the share of this currency would have to be taken up by the remaining member currencies in proportion to their weight in the basket torso.

Secondly, the question arises whether the value guarantee can be maintained where and when the EPC is the only circulating currency.

With regard to the transitional phase when some national member currencies still exist in some parts of the Community, this question must, no doubt, be answered in the affirmative. If the issuing institution ("EPC Bank") intervened vis-à-vis the national member currencies, so as to keep constant the EPC's weighted purchasing power (which it could do with absolute precision), it would make sure that the same amount of EPC, if exchanged for the basket of national member currencies, would buy the same standard basket of commodities. Moreover, to the extent that identical commodities were priced identically (at prevailing exchange rates), in all parts of the Community, these interventions would guarantee that the price of the standard basket of commodities would be stable (in terms of EPC) also in those regions in which the EPC were already the only circulating currency.

When the final stage is reached and the national currencies are no longer in circulation anywhere, the EPC's value can no longer be guaranteed through mere currency interventions, unless it is linked to some external currency, monetary asset, price index or interest rate. However, the indexed basket may be maintained as a mere standard of value; in this case, liabilities denominated in EPC would be subject to an EC index clause and thus keep their value in terms of the weighted basket of commodities as which the indexed currency basket was defined when the EPC was still a parallel currency.

2.1.4.3. Characteristics of an Optimal EC Store of Value

While in the case of a standard of value the same solution, namely the indexed basket of EC currencies, appears both most attractive for individual users and optimal from the point of view of microeconomic efficiency and macroeconomic policy, this assumption is not justified when money is considered in its function as a store of value.

2.1.4.3.1. Attractiveness to Individual Users

The attractiveness of a standard of value must be evaluated in terms of information cost and various risks; the attractiveness of a store of value depends in addition on the yield it offers. Since no interest tends to be paid on money (cash and demand deposits), the currency that appreciates most vis-à-vis the others offers the highest yield. Given that the real interest rate is positive, that all national EC currencies continue to lose purchasing power and that the strongest national member currency does not appreciate vis-à-vis the weighted EC average by more than the weighted EC average rate of inflation, the EPC value guarantee which, in terms of yield, is most attractive among the options that have been listed is the no-seigniorage basket, followed by the indexed basket and, thirdly, the EC currency option.

2.1.4.3.2. Micromonetary Efficiency

Money on which no seigniorage is exacted scores higher in terms of microeconomic efficiency of money holding than (non-interest bearing) money of stable purchasing power or the strongest but inflating national currency. As the theory of the optimum quantity of money indicates, the existence of seigniorage, i.e. of monopoly profits from the production of money, amounts to an excess of private costs over social costs of holding money; as a result of this discrepancy, private users will economise on money holdings excessively. If the payment of interest on currency in circulation is not feasible, seigniorage can only be completely eliminated when the price level keeps falling. When no interest is paid, the optimum quantity of EPC would be the quantity that reduces the price level (as measured in EPC) by the rate of interest paid on investments which are comparable to money.

However, the assumption that price stability implies seigniorage on currency in circulation may not hold. In the first place, coins and notes are not as cheap to produce and police as bank money. Further, the use of

currency for payments leads to its physical deterioration and hence gives rise to replacement costs; while in the case of bank money, this social cost of payments can be separated from the social cost of providing money to hold, this is impossible in the case of currency. For both reasons, currency should be made less attractive than bank money. Finally, to reduce the price level by the rate of interest is to incur considerable adjustment costs for the economy as a whole; these social costs may in fact exceed the social benefit of paying interest on currency, just as the transaction cost of paying interest on some types of bank deposits may exceed interest itself.

For these reasons, the theory of the optimum quantity of money is not entirely conclusive. It may well be that, from the point of view of micro-economic efficiency, an EPC of constant purchasing power is also an optimal store of value, provided the EPC Bank pays interest on commercial banks' reserve deposits and, possibly, on their reported average cash holdings, and provided the EC Commission enforces competition in the banking industry to prevent commercial banks from earning seigniorage on money deposited with them. Since seigniorage is a monopoly profit from the production of money, its elimination is, strictly speaking, not even a subsidy of EPC holders (or, even worse, a weapon to establish a monopoly through price war), but a pure benefit of restoring competition. It might even pay a private bank to denominate demand deposits (and loans) in the indexed basket using existing high-powered money from national sources as their monetary base. Total EC money supply would not be affected, but its composition by denomination would change.

2.1.4.3.3. Implications for the Effectiveness of Monetary Policy

The choice of an EPC value guarantee will affect the effectiveness of national monetary policies in two ways.

In the first place, the existence of an indexed EPC (and of EPC-indexed bonds etc.) would reduce the wide proliferation of money substitutes which have been introduced owing, in large part, to the loss of purchasing power of money. Since these substitutes are more difficult to regulate than national (and EPC) money supply, an EPC that would promise constant EC purchasing power would enhance the effectiveness of national monetary and financial policies.

Secondly, the less seigniorage is earned on the EPC, the smaller the variations will be in the interest-rate differential between (the largely non-interest-bearing) money and interest-bearing money substitutes and hence the irritating shifts between them which changes in monetary policy may call forth. A dear money policy, for example, would be less likely to be thwarted by unpredictable changes in the velocity of circulation and the effective bank multiplier.

Thus an indexed-basket solution and a no-seigniorage solution (whatever the latter may imply) for the EPC would be likely to increase the effectiveness of monetary policy.

2.1.4.4. Characteristics of an Optimal EC Means of Payment

Value guarantees affect the attractiveness of a means of payment not only because a means of payment is also always at least a short-term store of value and a partial standard of value, but also because value guarantees may have implications for intervention techniques and thus for transaction costs when a money (like the EPC) is a potential pivot currency. The value guarantee which, in present circumstances, is most likely to be used for an EPC pivot is the EUR CO-formula or some sort of qualified majority par-valuation. The indexed basket cannot be expected to serve as a pivot except in the medium term, provided the national member currencies return to approximate domestic price stability instead of being displaced by the EPC. Since the return to domestic price stability in all member countries (for the reasons stated in Section 1.2.) need not lead to exchange-rate constancy, an indexed-basket pivot around which to stabilise intra-Community exchange rates might indeed be a useful instrument: by offering an exchange-rate target consistent with approximate domestic price stability, it might reestablish fixed exchange rates as a universally acceptable policy objective.

2.1.4.5. The Optimal EC Value Guarantee - A Synthesis

The preceding analysis has shown that there may be no EPC value guarantee that is optimal for all functions of money. Nevertheless it seems safe to conclude that an EPC defined as an indexed basket of member currencies would offer a maximum of advantages. It would be most useful as a standard of value and, if it can be made to coincide with a no-seigniorage solution, as a store of value, the two functions of money for which value guarantees matter most. As a standard of value it eliminates the risks implied by inflation and purely nominal exchange-rate changes and minimises the risk

of real exchange-rate changes. It represents a way of dealing with two of the most serious economic problems that are presently confronting the Community: inflation (instability of price levels) and instability of exchange rates.

The other solutions that have been suggested seem even less desirable. From a theoretical point of view, the indexed-basket EPC is, no doubt, a second-best solution compared with an immediate return to price stability of national currencies and with immediate currency unification or a perfect coordination of national demand management resulting in constant equilibrium exchange rates. But given that the first-best solution does not appear attainable in the present real world, indexation to deal with instability of purchasing power, and currency baskets to deal with exchange-rate instability, seem preferable to the distortions which a fixing of nominal values and of disequilibrium exchange rates is bound to produce.

2.1.4.6. "Backing" the Value Guarantee

Modern monetary history has shown that fiat money will also be held and used by the public when it is not backed by precious metal or other real assets, provided the general belief prevails that it will maintain its approximate purchasing power. However, when inflation develops, money tends to gradually lose the functions of store and standard of value and finally, in hyperinflation, even if it is legal or forced tender, its role as a means of payment. It might be concluded by analogy that an EPC which promises constant purchasing power could also do without backing.

However, trust in the stability of a currency depends not only on promises but also on past experience. A new currency, like the EPC, cannot benefit from a good record of price stability; moreover, being a supra-national currency, there may appear to be some risk that its use would be prohibited by national member states which leave the union or that the union might collapse. For these reasons, there may be a case for keeping the EPC supply that is issued backed by, and reconvertible into, some familiar and sufficiently liquid assets at the conversion rate implied by the value guarantee. Since a direct commodity backing would seem to involve an unnecessarily high resource cost, the EPC Bank would be well advised to hold national EC currencies and other highly liquid assets denominated in them. These could be obtained either from the public to whom the EPC is issued or from the member governments. Since the EPC would appreciate

vis-à-vis the inflation-prone national currencies, perfect EPC backing would moreover require ^{on the average} that the EPC Bank earned a non-negative real rate of interest on its assets. If, for example, all ^{the} EPC were issued in exchange for national EC currencies and if the amounts of national EC currency obtained were not to be reinvested in private markets and thus rechannelled into circulation, the national central banks would have to pay a nominal rate of interest equal to the rate of inflation (i.e. a zero real rate of interest) on the amount of their national currency deposited with them by the EPC Bank. Thus the larger the part of the inflation tax which the member states have levied on the holders of money and which they would now lose, the larger amounts would be converted for EPC. Moreover, the EPC Bank would have to receive compensation from the national central banks for the real interest it pays on outstanding balances of high-powered EPC as far as this is feasible.

If EPC were only issued in exchange for national member currencies and if the national currencies obtained were reinvested in interest-bearing claims on national central banks, the EPC Bank would operate like a financial intermediary. It would be like a unit trust except that the claims it issued upon itself would be money, i.e. perfectly liquid. Compared with a private institution which might engage in such intermediation and reinvest its national currency receipts in private capital markets, the EPC Bank would merely benefit from the advantage (subsidy) that, backed by the national central banks as lenders of first and last resort, it would not have to obey the principles of banking prudence.

If the EPC were used to finance expenditure or loans, the unit-trust principle would require member governments to indemnify the EPC Bank through equivalent payments of national currency. If the EPC were issued in exchange for non-EC currencies, say, the dollar, at the conversion rate implied by the indexed basket, the unit-trust principle would demand that the dollars received could be reinvested either privately or with the Federal Reserve System in sufficiently liquid dollar assets which earned ^{a rate of} the same real rate of interest as the national member currencies or that the national central banks of the EC member countries transferred part of their foreign exchange (dollar) reserves to the EPC Bank to fill the gap. If such transfers became necessary the EPC Bank would automatically and gradually absorb EC reserves of non-EC foreign exchange in a reserve pool. But since such transfers would indicate that the Community paid seigniorage (or even

inflation tax) to the issuers of depreciating non-member currencies (just as it does when it intervenes in support of a weak non-member currency), issues of EPC in exchange for non-EC currencies which required such transfers would hardly be in the Community's interest.

Alternatively, the national central banks in the Community could use their foreign exchange reserves to indemnify the EPC Bank for the losses of purchasing power to which its holdings of national EC currencies will be subject. However, these contributions of foreign exchange reserves will have to be clearly earmarked so that the member central bank which gave them can be asked for compensation whenever they yield less than national currency contributions would have done.

If all foreign exchange reserves owned by the member countries were pooled with the EPC Bank from the start, member countries could dispense with payments to the EPC Bank until their contribution had been absorbed by their obligations to indemnify it on its holdings of national member currency. From a psychological point of view this solution might be advantageous. The national central banks are likely to prefer it because it permits them, for some time at least, to show solidarity by contributing to a reserve pool instead of paying interest on that part of their money which the European public has rejected. Moreover, to the public an "irrevocable" transfer of assets from the national to the Community level may appear as a stronger backing than a mere promise to pay. When the volume of the reserve pool has been absorbed by the interest obligations of the member central banks, the EPC may already be so well established and generally trusted, that backing of further issues would be unnecessary. The EPC would no longer have to have an "intrinsic" or "fallback" value; its value, as one writer has put it, would be purely "extrinsic", i.e. demand for it would exclusively depend on its usefulness, in particular on its expected stability of value.

2.2. Minimising Interference with National Monetary Policies

According to some authors, the EPC Bank should have far-reaching competences^{to} "control overall monetary policy" in the Community, notably to "ensure consistency between the general Community policy and the policies being pursued in individual states" (i.e. to stabilise intra-Community exchange rates). Others have recognized that this would very probably involve too high a degree of interference with national monetary policies to be acceptable to member governments and have therefore concluded that, on the contrary, the EPC Bank should be barred from selling EPC directly to the public. Instead, the supply of EPC available for issue should be allocated to the national central banks in exchange for national currency or, to prevent an increase in the international liquidity that is freely available to them, in exchange for a corresponding amount of their gold and foreign exchange reserves. In this case the EPC Bank would at the same time be a reserve pool and might be used to stabilise the EPC's external value while the national central banks might be increasingly restricted to interventions vis-à-vis the EPC (pivot solution).

In the light of what has been said about the desirability of value-maintenance provisions in the preceding section (2.1.), this controversy does not appear relevant. If the EPC is subject to some sort of long-term value guarantee vis-à-vis one currency or a basket of currencies, the equilibrium quantity of EPC that can and must be supplied is predetermined. In this case, the EPC Bank enjoys no discretion whatsoever; its "monetary policy" merely consists of supplying as much EPC as is necessary to validate the guaranteed EPC value. Whether the public obtained the EPC directly from the EPC Bank or only from the national central banks, would make no difference: the quantity that would have to be supplied would be the same. But while the method of issuing the EPC has no effect on the size of the EPC supply, it is almost certain to have a bearing on the rate of inflation of the national member currencies.

2.2.1. The EPC Issuing Mechanism

The EPC, or rather its high-powered component (the monetary base), can be issued in five ways:

- to finance purchases of goods and services (eg. by the EC Commission),
- to finance loans (eg. for regional development),
- to purchase or repurchase financial assets (open-market operations),
- to purchase non-EC currencies (notably the dollar),
- to purchase national member currencies.

If the EPC Bank used one of the first four methods, it would increase the total nominal money supply from monetary authorities in the Community; with the exception of EPC issued in exchange for non-EC eurocurrency, it would thereby ^{increase} also/ase the total nominal money supply available for transactions in the Community. But if the EPC could be used more freely in Community transactions than non-EC eurocurrency, the fourth issuing method, too, would be bound to increase nominal Community liquidity.

To the extent that the issue of an EPC of stable purchasing power and the payment of interest on the EPC reserves of commercial banks would raise the demand for real money balances, additions to the money supply available in the Community could be absorbed without a simultaneous decrease in the demand for national currency. However, to the extent that EPC were demanded not in addition to given balances of national currency but as a substitute for them, the EPC could ~~not~~ possibly add to real money balances; thus, unless the national central banks withdrew national currency (or increased its supply less than they would otherwise have done), inflation would reduce the value of increased nominal money balances until the equilibrium volume of real money balances ~~were~~ restored. Since an EPC of constant purchasing power cannot, by definition, be subject to inflation, the adjustment would (ceteris paribus) have to be brought about through inflation (and depreciation) of the national currencies.

For this reason, the national central banks must not reissue the amounts of national currency which the public sells to the EPC Bank and which the EPC Bank withdraws from circulation. The targets of national money supply policy will have to be defined not in terms of nominal supply of national money in circulation but in terms of rates of issue of national money measured in percent of the current and changing quantity of national money in circulation.

It is the advantage of the conversion method of issuing the EPC that it does not require the national central banks to act to avoid *such* inflationary implications. However, there are three other factors which would demand an active adjustment of national monetary policy if given national price level targets were still to be attained.

First of all, the national central banks would have to allow for the fact that EPC balances once they are in circulation do not lose their purchasing power as the national money replaced by them would have done; this means that the target amount of issue of national money would have to be reduced by the amount of the inflation tax which the central banks would have earned on the national money supply now replaced by the EPC.

Secondly, an analogous argument applies to the interest which the EPC Bank would pay on the EPC reserves of commercial banks: the target amount of issue of national money would have to be reduced by the seigniorage gains which the central banks would have earned (i.e. *by* the interest payments which they would have saved) on the reserves of national currency now replaced by the EPC.

Finally, the central banks would have to allow for the increase in the demand for real money balances that might be expected when a new currency of constant EC purchasing power is supplied. National price level targets remaining unchanged, the target amount of issue of national money would have to be *aug*mented by the increase in demand for real balances.

In summary, the conversion method of issue seems optimal in that it does not require the national central banks to compensate for all issues of EPC through active withdrawals of national money. However, if given national price level targets are to be attained, they will have to allow

for losses of inflation tax and seigniorage and for increases in demand for real balances; but as long as national inflation targets are high and rates of real growth positive, these adjustments are quite unlikely to require net withdrawals of nominal supply of national money by national central banks.

If the issuing of EPC in exchange for dollars did not prove profitable, not only the conversion method but also the unit-trust principle would imply that the Eurodollar could not be converted for EPC at the EPC Bank. But it would be a fallacy to believe that the EPC issuing mechanism determines whether the Eurodollar loses its market share in the Community. The offer of an EPC of constant EC purchasing power is very likely to shift demand for money from the Eurodollar (and the other non-EC currencies) to the EPC. If Eurodollars were not accepted by the EPC Bank, there would be an excess supply of dollars; i.e., unless the Federal Reserve System reduced the supply of dollars by an equivalent amount (or increased it less than it would otherwise have done), the dollar would experience a higher rate of inflation and (*ceteris paribus*) depreciate vis-à-vis the national EC currencies and, even more so, vis-à-vis the EPC. Thus the share of Eurodollars in the real EC money supply would be reduced.

If the national EC central banks wanted to ~~reach~~ their price level targets, they would not be permitted to resist to the depreciation of the dollar. But if the EPC could only be obtained in exchange for EC member currencies, they would have to allow for the fact that their currencies would be increasingly used for conversion purposes. They should satisfy the increased transaction demand for their national currencies, thus preventing a lower than planned rate of inflation and a higher than planned appreciation of their currencies. Just as the present vehicle-currency role of the dollar permits the Federal Reserve System to issue dollars (interest-free loans) without increasing the rate of dollar inflation, the future role of the national EC currencies as an intermediary or vehicle for external EPC demand would allow the central banks of the member countries to issue more of their currencies while upholding their price level targets: there would be a transfer of seigniorage from external issuers to the national EC countries. It is true that the central banks of the member countries would now have to pay interest on the amounts of their currencies which

the original holders of non-EC currencies had acquired and then sold to the EPC Bank ~~for EPC~~; but while they ceased to earn seigniorage on those balances, they could replenish the supply of their currencies by exactly the same amount and would earn exactly the same amount of seigniorage on these. Thus there remains the net increase of seigniorage owing to the increased demand for national member currencies for EPC conversion.

The preceding analysis shows that the Community would lose seigniorage if EPC were issued only in exchange for non-EC currencies as some authors have suggested. This conclusion holds regardless of whether the EPC is to displace the national EC currencies or only the non-EC eurocurrencies (provided such discrimination could be enforced).

Nevertheless, the Community might consider issuing EPC in exchange for non-member currencies if it is demanded for extra-Community transaction or reserve purposes. Whether it does so should depend on the profitability of investments in these non-member currencies, the loss of transaction seigniorage involved and the difficulty of determining whether the national member currency that is exchanged for EPC under the EC conversion mechanism comes from original non-EC currency holders and is thus to be reissued or ~~whether~~ it is rejected by Community residents and thus to be frozen.

There remains the question whether the EPC should be issued in exchange for amounts of national EC currency however these are composed or only in exchange for ^{precisely that} EC currency basket as which it is defined. If the latter mechanism (basket conversion) were used, cross-rates between the national member currencies would (ceteris paribus) be affected if the distribution of demand for EPC among holders of the various national EC currencies would not correspond to the respective weights of these currencies in the EPC basket formula. To prevent an unplanned disinflation and appreciation of the national EC currencies whose holders demanded proportionately less EPC than corresponds to the weight which these currencies have in the EPC basket, the central banks of the member countries concerned would have to reissue the difference. Since they would obtain seigniorage on the reissue, the conversion of their national currencies by original holders of the other national EC currencies and the consequent interest payments on these amounts would not give rise to a net loss of seigniorage. On the contrary, to the extent that the conversions by original holders of other

member currencies increased the transaction demand for the proportionately less rejected national EC currencies, they would be able to issue additional amounts of their currency and hence earn more seigniorage than would have been the case if the demand for EPC were distributed among the holders of national EC currencies according to ^{the} weights of these currencies in the basket. Obviously, the reverse applies to the member countries whose currencies are rejected in larger amounts than their weights would allow: these central banks would have to withdraw national currency.

If the interference with national monetary policies were to be minimised, a mono-currency conversion mechanism should be adopted. In this case an EC national who wanted to hold EPC rather than his national currency could obtain the desired sum of EPC directly in exchange for that amount of his national currency which he would need if he wanted to buy on exchange markets the other currencies required by the basket conversion method. The exchange rate between his national currency and the EPC (V_1) would be given by the formula $V_1 = \frac{W_1}{Q_1}$ where W_1 is the fractional weight in the basket which his national currency (1) has at prevailing cross-rates and where Q_1 is the amount of his national currency in the basket formula. Under the mono-currency conversion mechanism the cross-rate effects which result from basket conversion would not arise: the supply of the rejected national member currency would fall by the same amount as demand for it had fallen (given the prevailing set of exchange rates). Of course, this conclusion would not hold if the EPC Bank rearranged its portfolio so as to bring the composition of its assets into conformity with the composition of the basket EPC (its liabilities); if it did so, there would be no difference between basket conversion and mono-currency conversion except that under mono-currency conversion the EPC Bank would bear the costs of exchange and the risk that its sales of excessively converted national currencies might depress their exchange value below the implicit cross-rates at which the EPC Bank had accepted them.

If the EPC Bank permitted a discrepancy to develop between the currency composition of its assets and its liabilities, the central banks whose currencies had been converted for EPC in excess of their weights in the basket would have to pay correspondingly more interest so as to keep the value of the assets of the EPC Bank in line with the guaranteed

appreciation of the outstanding EPC balances. Thus these central banks would have to bear the risk that the real exchange rate of their currencies might depreciate vis-à-vis the EC average or that the real rate of interest on investments in their currencies might be lower than the EC average, for the payment of which they would have to indemnify the EPC Bank. While mono-currency conversion is likely to be more efficient than basket conversion, it involves a less proportionate distribution of costs and benefits between the Community members.

2.2.2. Reserve Requirements for Currency Deposits

It has been suggested that EPC demand deposits should not be subject to reserve requirements because the required ratio of reserves would either be held anyway (in which case public regulation is superfluous) or it would be too high (in which case it represents a tax on commercial bank intermediation). In the latter case, it produces either a shift of intermediation away from the commercial banks which are specialised in it or it results in disintermediation altogether. Another reason that has been given for dispensing with reserve requirements on EPC deposits is that the EPC ought to be on an equal footing with eurocurrency deposits if it is to outcompete them. However, the attractiveness of the EPC is not enhanced by the absence of reserve requirements if the alternative is minimum reserves on which a market rate of interest is paid by the EPC Bank (as has been suggested).

What arguments are there against a system of voluntary reserve holding by commercial banks? Obviously, it cannot be objected that the lack of reserve requirements would permit an excessive or unpredictable expansion of EPC supply, for the supply of EPC is controlled through the conversion operations of the EPC Bank, and is determined by the demand forthcoming at the guaranteed EPC conversion rates. Reserve requirements are not needed for the purpose of monetary control because the value guarantee to which the EPC is subject sets by itself the limit to EPC expansion. For example, if the ratio of voluntary EPC reserves fell and the effective bank multiplier for EPC deposits rose, the EPC Bank would (ceteris paribus) be obliged by the value guarantee it has given to reduce the EPC monetary base through sales of national currencies.

A second objection which might be raised against a system of voluntary reserves for the EPC is that commercial banks may choose too low a ratio and thereby increase the danger of bank illiquidity and failure. Experience with eurocurrency markets hitherto offers little evidence of such financial imprudence, but, of course, historical observations are never conclusive when the future is concerned.

Finally, there is the question whether the issue of EPC reserve requirements matters for the degree of non-interference with national monetary policies. If by the mono-currency conversion mechanism an amount X of member currency A is converted for EPC at the EPC Bank, the supply of A will be reduced by aX and the supply of EPC will increase by eX where a and e are the effective money multipliers for currency A and the EPC, respectively. If the required reserve ratio for A is higher than the ratio which commercial banks would hold voluntarily and if there are no reserve requirements for EPC deposits a will be smaller than e . In this case, the increase in the EPC supply will be greater than the reduction of the nominal supply of A . This conclusion holds irrespective of whether the EPC value guarantee would oblige the EPC Bank to repurchase $(e-1)X$ and hence to prevent EPC multiplication or not. If a is smaller than e , the increase in the total nominal money supply of EPC and A that results from any conversion of A for EPC would require that, ignoring possible increases in the demand for real balances and given unchanged price level targets for A , the central bank concerned should reduce the supply of A by $(e-a)X$. Obviously the compensatory adjustments of national monetary policy that would be necessary would be the smaller, the more closely the EPC effective money multiplier approximated the weighted average money multiplier and the more similar these were among the national member countries. However, to the extent that EPC is held more in the form of notes and currency than the national monies because in the case of cash the loss of purchasing power cannot be compensated by interest payments, equality of effective money multipliers would require a lower reserve ratio for EPC deposits. But just as existing differences between national money multipliers have not created noticeable difficulties when monetary movements between the member countries occurred in the past, there is every reason to assume that even "massive", "sudden" and "speculative" movements of funds into (and possibly out of) the EPC

could easily be allowed for by adjustments of national money supply policy. Indeed, to a large extent the shifts from the national EC currencies into the EPC would be a substitute for the shifts which are now experienced between the national member currencies and which are at least as difficult to compensate.

When it is sometimes objected that the coexistence in one country of two currencies which may be used for domestic transactions would increase currency speculation and hence the volatility of funds, two assumptions are made which seem debatable. The first assumption is that speculation tends to destabilise rather than to stabilise exchange rates (or smooth exchange-rate changes) in the medium and long term. Secondly, it is supposed that funds will move out of the EPC just as easily as they move into it. It is very probable, however, that shifts into the EPC will prove largely irreversible; confidence in the stability of the national currencies is much more likely to be shaken than confidence in a no-seigniorage EPC of constant purchasing power, backed ^{by} equivalent assets. Indeed, the EPC is likely to function as a haven not only for part of the "oil funds", but also for that part of European liquidity which, owing to bloc floating (i.e. the increased short-term exchange risk vis-à-vis the dollar and its replacement as an intra-EC intervention currency) has moved out of the dollar into European currencies but is still suffering from the depreciation (inflation) risk.

Whether and how high a reserve ratio is finally fixed for EPC deposits would depend on whether more weight is given to the objective of unfettered commercial bank intermediation or to the objectives of preventing bank illiquidity and of minimising interference with national monetary policies.

The implications of the parallel-currency approach for national money supply policies can at this stage be summarized. If national price level targets are to be maintained, the issue of EPC requires certain compensatory adjustments in national monetary policies. These adjustments can be kept small by an appropriate issuing mechanism and appropriate reserve requirements for EPC deposits, but just as they are necessitated by any shifts between the national member currencies and the eurocurrency market, in particular the non-EC eurocurrencies, nowadays, they cannot be avoided completely in the case of EPC conversion. However, unlike under a system

of fixed exchange rates, ultimate monetary sovereignty is not lost. The national member states will be free to bring about any national rate of inflation or any national money supply they wish. What will change is merely the rate of inflation implied by a given national monetary policy and vice versa. Indeed, the national central banks will be free to prevent any issue of EPC whatsoever by keeping their own currencies sufficiently scarce and thus stable and by paying interest on the reserves of their currency which are held by commercial banks.

2.2.3. Limiting the Supply of EPC

While some commentators have expressed the opinion that a parallel currency would not be accepted by the public unless it were forced upon it and that demand deposits and other contracts denominated in a European unit of account of constant purchasing power would already be a common feature on European markets if such a unit were really useful, others have argued that the type of EPC suggested would be too attractive to permit a gradual process of substitution and that for this reason the parallel-currency approach would be politically unacceptable to EC member governments.

The precise speed of EPC penetration, it is true, is hard to predict. To prevent the EPC from outcompeting the national member currencies in a year or two and hence from running counter to the principle of gradualism, the member governments could choose to set ceilings on the annual rate of issue of EPC. In this case the EPC Bank would have to stop offering EPC altogether once the ceiling had been reached.

To fix the ceiling the member governments should, first of all, agree on the earliest acceptable date for complete currency unification. They would then estimate the Community demand for total real balances that is likely to prevail in each year up to that date allowing for both the real interest (inflation) elasticity and the income elasticity of demand for money; finally, they could ensure a constant speed of maximum EPC penetration by raising the ceiling for the accumulated supply of EPC each year to

$$L_i \cdot \frac{1}{N}$$

where

N is the number of years from the date of the agreement to the earliest acceptable date of currency unification,

i is the ordinal number of the year measured from the date of the agreement, and where

L_i is the expected demand for real balances in the Community in year i .

Issues of EPC to original holders of non-EC currencies would not fall under this ceiling. However, if it proved too difficult to obtain more than a very rough estimate of their volume, demand for EPC from present holders of non-EC currencies could also be estimated in advance and be added to the $L_1 \cdot \frac{1}{N}$ ceiling. It may even be that during a preliminary stage only the estimated demand of non-EC currency holders is chosen as a ceiling. In this case, the EPC ceiling should be equal to the monetary base of these deposits.

While ceilings on the issue of EPC have indubitable and substantial political advantages, they have also indubitable and substantial economic disadvantages. For whenever a ceiling is reached, the market value of the EPC would rise above its guaranteed value, i.e. the EPC would lose its usefulness as a standard of value, while its attractiveness as a store of value would be only temporarily increased. Since the benefits of an inflation-proof standard of value are likely to exceed the benefits of an EPC store of value, the best way of incorporating issuing ceilings in the EPC strategy is probably to split the store and standard functions temporarily, i.e. to keep the indexed basket as the EC standard of value and to separately introduce the EPC as a store of value and means of payment. The economic disadvantage consists then of avoidable costs of information (diseconomies of small scale) which diminish the usefulness of both the indexed basket standard of value and of the EPC. It is one of the damaging consequences of inflation that the means of payment is no longer used as a standard of value; precisely this decomposition of the functions of money would fail to be prevented if ceilings were imposed on the issue of EPC.

Nevertheless, such ceilings would be of a global nature and would not imply the interference with, and distortions of, the currency pattern of private transactions which restrictions on the use of EPC balances would entail.

2.2.4. Restricting the Use of the EPC

Restrictions on the use of the EPC can concern each of the three functions of money. However, the most frequent suggestion is to restrict the EPC's use as a means of payment and a standard of value while admitting it freely as a store of value.

Among the proposals that have been made, the most plausible suggestion is to prohibit the EPC in all transactions between residents of the same member country; the EPC could then not be used to denominate contracts between residents of the same member country nor for payments between them. At first sight this suggestion seems unobjectionable. The restriction proposed, it is true, would limit the economic benefits of the EPC and would hence be clearly a second-best solution from an economic point of view; but quite apart from its great political appeal, an indexed-basket EPC for international use only would, in economic terms as well, represent at least an improvement on the present situation. At the very least, as some skeptics have argued, it would permit a controlled test of the usefulness of the indexed-basket formula.

While there is little doubt that this solution would be better than nothing, it is not at all certain that it could be attained in practice. Either the indexed-basket EPC is highly attractive as a store and standard of value and as a means of payment although its use is permitted only in international transactions; in this case it would seem extremely difficult, if not impossible, to prevent its use also in domestic transactions. Or the EPC, being permitted only for international transactions, would lack economies of scale and hence economic appeal to such an extent that, after a short trial period, it would be rejected by the market; indeed, restrictions might be the most effective way to wreck the whole parallel-currency approach and to discredit the aim of currency unification altogether.

These objections will have the greater weight, the more the restrictions lose their global nature, i.e. for example, if the EPC could only be used by banks, or by companies, or at least not for salary payments and retail purchases, or if its use were confined to transactions above a minimum amount or if it were only issued in the form of deposits or of deposits and large notes as has been suggested. Moreover, the more these restrictions infringed upon the micro-level, the less the EPC would succeed in raising micro-monetary efficiency.

This conclusion holds in particular for exchange controls. Since the EPC is primarily designed to facilitate transactions between residents of different EC member countries, effective exchange controls would impair its usefulness more than the usefulness of the national member currencies. On the other hand, if the EPC nevertheless proved to be a more useful money than the national currencies, those member states which have erected the highest barrier of controls would be accused by their own citizens of depriving them of advantages, which the nationals of other member countries could freely enjoy. If such public pressure did not suffice to start a competitive reduction of exchange controls, they might become increasingly unenforceable. Evasion would become the easier, the more the EPC were also used in domestic transactions.

2.2.5. Confinement to a European Unit of Account

An inflation-proof standard of value is not only likely to offer more benefits than an inflation-proof store of value and means of payment; it is also likely to meet less political resistance from the member governments and the member central banks. This is because the issue of a parallel currency implies a loss of seigniorage and a need for compensatory adjustments of national monetary policies while the use and promotion of a parallel unit of account does not. Hence a number of authors have suggested applying the principle of gradualism to the monetary functions of the EPC as well. Several stages could be envisaged. The indexed

basket could become successively

- an administrative unit of account used by the Community institutions,
- an official reserve asset and means of settlement issued by the European Fund for Monetary Co-operation (in exchange for gold and foreign exchange reserves held by member central banks),
- a private unit of account used for accounting purposes and to denominate private contracts (including bonds, loans, and bank accounts),
- a scriptural (deposit) money, and finally
- a full parallel currency.

Since the same type of value guarantee, namely the indexed basket, is most appropriate for each of these purposes (compare the analysis in Section 2.1.4.2.), there would be no problem in passing from one stage to the next: the indexed basket would merely be given one monetary function after the other. However, any other type of value guarantee would imply a breakdown of this process at one point or another: the market would reject it. For example, if an unattractive standard like par-valuation or a currency option were chosen as an administrative unit of account, it would be rejected as a private unit of account. Similarly, if an attractive but suboptimal standard like EURCO were introduced for administrative purposes and also gained acceptance as a private unit of account, the process would break down when the attempt were made to issue a parallel currency denominated in this way; for as a store of value it would be inferior to the strongest member currencies.

Although the indexed-basket formula - and only the indexed-basket formula - would permit a "passage en douceur" from one stage to the next, such functional gradualism, even more than restrictions on EPC use, involves the risk that the indexed basket will fail to overcome the diseconomies of small scale which have prevented its entry as a private unit of account in the past. This barrier may be so high

for any new unit that even an indexed-basket standard of value that were used by the Community institutions would fail to be attractive enough to the market. The promotion of the new product is likely to require a comprehensive marketing strategy, the mutual reinforcement which a simultaneous launching as a risk-reducing standard of value and a high-yield store of value would offer. Moreover, the earlier seigniorage begins to be reduced, the better for micromonetary efficiency.

2.2.6. Transition to the Final Stage

The loss of monetary sovereignty that is suffered by the national member governments would ^{be} the smaller, the later the moment in which they had to stop the issue of national money. In theory, the national central banks could, of course, be left free to issue national money ad infinitum. However, such sovereignty would be purely formal; for if all newly-issued national money were immediately exchanged for EPC at the EPC Bank, the national central banks would no longer earn seigniorage or regulate a money supply of national currency. In addition, it would be a highly cumbersome and inefficient system. Hence it seems advisable to stop new issues of national money once the EPC accounts for an overwhelming proportion of total real money balances from Community sources. The precise percentage might conveniently be agreed upon in advance. The consequent "limping" national-currency standard would finally be succeeded by full currency union as the remaining national money balances would be converted for what would now become the unique Community Currency. It is at this stage at the very latest that the EPC Bank would become a full-fledged EC Central Bank. The Community Currency would no longer be issued in exchange for national currencies, but in the same way as the national currencies before. (The implications of this step for the maintainability of the EC value guarantee have been analysed in

Section 2.1.4.2.7.)

3. The Prospective Process and Pattern of EPC Penetration

By whom and for which purposes would an EPC of constant EC purchasing power be used first? How and at which speed would it spread over the Community?

In principle, it is clear that the economies of scale in the use of money should make for continuous acceleration in the process of EPC expansion. This is because the EPC will become the more attractive,

- the more numerous the functions for which it is used by an economic agent (individual economies of scale),
- the more people use it (social economies of scale), and
- the longer it has been used (temporal economies of scale).

While individual and social economies of scale concern the cost of both information and exchange, temporal economies of scale are only economies in information costs, i.e. in the use of memory; they obey learning-by-doing laws.

Beyond this general conclusion, a prognosis of the process and especially the pattern of EPC penetration in the Community (and - in an analogous way - outside) requires a neat distinction between the EPC's functions as a standard of value, store of value and means of payment.

3.1. The EPC as a Standard of Value

The indexed-basket standard of value eliminates the inflation risk and it minimises the risk which real exchange-rate changes involve for the partners to an international contract. Thus two groups of prospective users can be distinguished.

3.1.1. Exchange Risk

As has been explained in Section 2.1.4.2.4, an EPC of

constant EC purchasing power eliminates the risk inherent in nominal exchange-rate changes and distributes the remaining risk of real exchange-rate changes so as to minimise its disutility and to avoid the diseconomies of small scale in information costs which a multitude of bilateral indexed currency baskets would produce. It follows that the EPC will spread the faster as a standard of value, the larger (and less predictable) the real exchange-rate changes in the Community. In the first place, the EPC will be used by those who have to fear exchange risk-most, i.e. by those companies and citizens who are most active in trade and capital transactions between the member countries. The EPC will be the more attractive for them, the more the pattern of their transactions corresponds to the weights which the individual member currencies have in the indexed basket. Since the central regions are both most "open" in terms of trade and capital transactions with other member countries and likely to show a more balanced pattern of transactions which corresponds more nearly to the composition by currency of the indexed basket, EPC penetration should be expected to exhibit a "centralist bias". From the point of view of exchange risk, the EPC will have the least appeal with a local public like retailers, workers etc. who traditionally deal only in one currency and would face particularly high costs of information and of transaction or portfolio management if they employed a parallel currency.

3.1.2. Inflation Risk

The inflation-proof EPC standard of value will spread the faster in the Community, the greater the variations in the rate of inflation of the national member currencies and the faster remaining money illusion is eroded. Variations in the rates of inflation and awareness of them, in turn, are likely to be the greater, the higher the rates of inflation in the member countries. Since the EPC will contribute to the destruction of money illusion, its penetration will be self-validating and self-accelerating in this respect as well. A further element of self-acceleration is the fact that the stability of the national member

currencies will become increasingly sensitive to all sorts of shocks as national currency domains shrink ("law of small numbers"). On the other hand, the approaching of the final stage at which the European currency's value can no longer be maintained with precision through interventions vis-à-vis national member currencies, will act as a brake on the process of EPC penetration. But since the indexed-basket standard of value can be used as a contract unit independently of the value of the Community currency, this deceleration effect is likely to be small. The disadvantage that arises as the final stage comes nearer is merely the increasing risk of diseconomies of small scale which the split between the indexed-basket standard and the European currency would imply.

National currency inflation and the erosion of money illusion will also determine the geographical pattern of EPC penetration. The inflation-proof EPC standard of value will spread at first in the high-inflation countries where the inflation risk and the awareness of it tend to be greatest. The awareness of inflation risk will also depend on the extent to which index-linking has been permitted in the various member countries in the past. If private economic agents are familiar with debts linked to the national cost-of-living index, the step towards the indexed-basket standard would involve little information cost. On the other hand, national index clauses would compete with the indexed-basket standard and hamper its use in contracts between nationals because they are better tailored to protect against national inflation risks. While it is obvious that the indexed basket standard would spread fastest in member countries in which the use of national index clauses had been unrestricted in the past, but were restricted at the time of the launching of the EPC, it remains thus an open question whether the indexed basket standard would spread faster where the use of national index clauses remained restricted than where it remained

unrestricted.

It is also not quite clear whether, from the point of view of inflation risk taken in isolation, the indexed basket is more likely to spread in the central or in the peripheral regions of the Community. On the one hand, there is evidence that inflation rates tend to be higher in the peripheral regions since wage bargains and monetary policy fail to fully compensate for their less favourable location and their consequently lower increases in marginal value productivity. On the other hand, the awareness of inflation risk is likely to be more pronounced in the big enterprises which tend to have their seats near the Community's industrial centre (Southern England, the North-East of France, the Benelux Countries and the Rhine valley).

Since fluctuations in the rate of inflation are most likely in the small and less diversified countries, inflation risk is a further reason why the EPC should spread particularly there.

Further, it is certain that the indexed-basket standard will be used in the first place for long-term contracts, for the longer the term of the contract, the larger the potential inflation risk. Thus the indexed basket can be expected to denominate mainly forward supply contracts for investment goods, energy (oil!), ship-building and construction, long-term leases, leaseholding, pensions, alimonies and insurances and, most of all, debts on capital markets where both income (interest) and principal call for protection against a loss of purchasing power.

Experience on international capital markets suggests that bonds etc. tend to be denominated in the strongest currencies or units. Apparently, interest-rate differentials fail to fully reflect expected exchange-rate changes. Moreover, this preference for denominations in strong currencies and units seems to be due to the fact that some member countries do not tax long-term capital gains or tax them at a lower rate than interest earnings. Since indexed bonds etc.

tend to

offer a low nominal interest rate but a high nominal capital gain, the indexed-basket standard is most attractive for lenders (and hence borrowers) in these countries especially, of course, for lenders in high income tax brackets. On the other hand, it would not be attractive for lenders who had to pay full income tax on capital gains on an increasingly progressive scale and whose assets did not exhibit a continuous term structure; for since indexed bonds ^{tend to} offer lower nominal interest payments but a higher nominal repayment of principal, the flow of receipts is less evenly spread over time than in the case of non-indexed bonds, unless, of course, the indexed bonds in the individual's portfolio mature at the same intervals as interest instalments are paid.

Finally, as has been explained in Sections 2.1.4.2.2. and 2.1.4.2.4., any new standard of value is most likely to be accepted by those who do not have net claims or net obligations denominated in the old standard(s) against which they wish to hedge. An inflation-proof standard, in particular, will be most attractive for ultimate buyers and sellers of consumer goods whose nominal expenditure and whose nominal receipts, respectively, are closely correlated with the consumer price index. For these reasons, the financial intermediaries may be slower in accepting the indexed basket as their unit of account; moreover, they may be under the impression that an indexed standard of value is not in their interest (because it tends to destroy the money illusion that has remained with small savers). It may take some time before they realise that the contrary is true (compare p.43).

3.2. The EPC as a Store of Value

Just as in its standard-of-value function, the EPC of constant EC purchasing power will spread the faster as a store of value, the higher the national rates of inflation.

But while the attraction of the indexed-basket standard of value is only due to the protection it offers against the risks of inflation and of real exchange-rate changes, the EPC store of value will also benefit from the higher yield it earns as compared with inflating (and depreciating) national member currencies.

Since the EPC of constant EC purchasing power is ^{probably} "stronger" than all these currencies, it is likely in the long run to displace all of them as a store of value (provided the risk that it might be declared invalid or inconvertible is considered small). In the short run, however, there may be differences in the speed of EPC penetration between the member countries: the proportion of national real money supply that is replaced by EPC per unit of time will be the larger, the faster the national member currency depreciates, i.e. the higher its rate of inflation and the less favourable the real exchange-rate adjustments it undergoes.

Secondly, the EPC will spread fastest in those member countries in which high rates of past inflation and experience with indexation have left least money illusion. For the EPC store of value it does not matter whether the respective member countries also permit national index clauses. For while national index clauses are a substitute for the indexed-basket standard of value, they are not a rival for the EPC store of value. National index clauses are not national index currencies.

It has already been mentioned that, compared with national money, the EPC would be more attractive in the form of notes and currency than in the form of deposits on which interest can be paid to compensate for loss of purchasing power. This means that, thirdly, the inroads which the EPC will make into a national member currency will be the greater, the larger the proportion of notes and coins in the national money supply and, more generally, the less interest is paid on holdings of the national money (including demand

deposits). Given that interest-rate differentials fall the shorter of expected exchange-rate changes, the shorter the term of the asset concerned, it might further be concluded that, compared with the corresponding national currency assets, EPC money would be more attractive than EPC quasi-money and longer-term deposits. But probably these differences of attractiveness between the various forms of EPC money and quasi-money are of relatively little importance. In the first place, the choice between EPC coins, notes demand deposits and term deposits will be affected by the traditional asset preferences of the transactors to whom the EPC appeals most in each of its three functions; and these transactors are more likely to be big companies than individual consumers and retailers, who are the main users of notes and coins.

3.3. The EPC as a Means of Payment

As has been explained (in Section 2.1.4.), a means of payment will be more useful, the more attractive it is as a standard and, in particular, as a store of value. However, apart from the criteria that have been identified hitherto, the EPC's use as a means of payment will depend on one more factor: the cost of exchanging one currency for another (or of managing a multi-currency portfolio).

In no other function is money subject to greater economies of scale than in its role as a means of payment. Being an infant currency the EPC will thus be least attractive for this role. Indeed, as far as costs of exchange are concerned, the EPC will be far less attractive for domestic transactions than the national member currencies. Initially the disincentive to use the EPC as a means of payment will be smallest for transactions with residents of other countries and currency domains in which costs of exchange have to be born anyway, and it will be the smaller for the individual transactor, the larger his transaction turnover across currency boundaries. Thus, from the point of view of exchange costs, EPC penetration is most likely

(or rather least unlikely) to begin in those areas which are most "open" vis-à-vis other member countries, i.e. notably in the smaller and central member countries and, in particular, in those of their regions which border on other member countries, and in those of their industries which are most actively engaged in international intra-Community transactions. The border of the EPC domain would then gradually move like a linguistic frontier: currency dualism, having started in the border regions, would spread into the homeland, and as the next following regions got acquainted with the parallel currency (language), the former border regions would give up the less useful currency (language) and return to a mono-currency (-language) standard.

To argue that the use of the EPC as a means of payment will be least disadvantageous for cross-border transactions is, of course, not to ignore that even in these transactions, conversion via the EPC would cost far more than (initially twice as much as) direct exchange of national currencies as long as the EPC had not yet developed the economies of scale which are a prerequisite for a vehicle currency. Only when the EPC exchange markets had gained a greater breadth, depth and resiliency than the dollar market could the EPC take over from the dollar as the vehicle currency which reduces the number of bilateral exchange markets from $\frac{n(n-1)}{2}$ to $n-1$.

As the EPC is used in more and more transactions, the cost of exchange per unit exchanged will thus fall. At the same time, the number of units that have to be exchanged for national currencies will diminish. As more and more international transactions are settled in EPC, it pays increasingly to hold EPC working balances instead of working balances of national currencies. The fewer the currencies which need to be held in the portfolio, the cheaper its management and - according to the insurance principle - the smaller the required size becomes.

These effects will make themselves particularly felt if the EPC is also increasingly used for domestic transactions. Since the EPC is superior to the national currencies ~~in that~~ it can be used without ^{is} (or at least subject to fewer) restrictions in all member countries and ~~in that~~ restrictions of its convertibility are likely to be less stringent and less enforceable (compare Section 2.2.5), the EPC itself will soon benefit from economies of scale.

3.4. The Pattern of EPC Penetration and the Theory of the Optimum Currency Area

In the absence of externalities and market imperfections, currency competition would be bound to produce optimum currency areas. Since the EPC has been shown to give rise to a number of real-income externalities, it has to be asked whether these external effects are economies or diseconomies. The preceding analysis has shown that both from a micro-economic and from a macroeconomic point of view an EPC of constant EC purchasing power would permit important welfare gains, i.e. that the external effects which any individual decision in favour of the EPC would have on other currency users are, on balance, of a positive nature. In the following these benefits will be related to the "optimality" criteria which the theory of the optimum currency area has developed.

3.4.1. Microeconomic Efficiency of Transactions

It has been pointed out that currency unification is the more beneficial, the smaller and the more open the currency areas that are to be merged. One argument advanced in favour of this proposition is that the economies of scale in transaction costs and information costs which currency unification will bring are the larger, the higher the proportion of transactions had been with residents of other currency areas in the past. Since the EPC, as has been shown, would tend to penetrate faster in the smaller and more open member countries than in the larger ones, the pattern of EPC penetration and hence the parallel-currency approach seems optimal on this account.

3.4.2. The Macroeconomic Need for Exchange-Rate Adjustment

From a macroeconomic point of view, the sacrifice of exchange-rate policy which currency unification implies is the harder, the greater the need for adjustment between economies for which exchange-rate variations can be a potent tool. The need for exchange-rate adjustment is the smaller,

- the smaller the cost of unifying demand management in the economies to be merged,
- the more diversified they are (law of large numbers), and
- the higher the factor mobility between them (as a substitute for exchange-rate adjustment).

The cost of a unified demand management within the currency union (or, initially, the EPC domain) is the larger, the greater the differences between the Phillips curves (the short-term trade-off between inflation and unemployment) and between the inflation/unemployment preferences of the areas to be merged under the Community currency.

With respect to preferences, the composition of the Community floating bloc seems to indicate that national propensities to inflate are presently most similar among the central Community countries where the EPC, as has been shown, is, on balance, likely to spread fastest. If it is true that preferences for monetary stability are the result of historical experience, it may not even be a complete coincidence that the present floating bloc covers precisely the area in which the Hamburg Mark Banco prevailed in the 17th century. Given such differences in national inflation preferences, it seems important that they are narrowed in the gradual process which the parallel currency approach implies.

With regard to the trade-off between inflation and unemployment, it is beginning to become conventional wisdom that the Phillips curve is highly unstable in the short term and almost perfectly vertical in the longer term as money illusion is eroded, i.e. ^{that} inflation is unable to raise

employment persistently above the level which would obtain in conditions of price stability. Since the Phillips curve depends on money illusion and since the EPC will spread fastest in areas where money illusion is smallest, EPC penetration will concentrate on those regions in which the trade-off between inflation and unemployment is very similar (namely low).

Similarity of money (dis-)illusion does not require similarity of expected inflation rates. Hence the parallel-currency approach can dispense with the costly undertaking of assimilating the inflation rates of the national member currencies which the Werner Approach requires and which, owing to the lagged adjustment of price expectations, is likely to produce unemployment in the disinflating countries and the build-up of excess capacity in the inflating country. Instead, national differences in price expectations and in the historical experience on which they are based, are made irrelevant through ex post indexation of the common currency.

As for the second criterion, diversification, it can be observed that the central regions of the European Community possess an industrial structure which is more broadly based than that of the peripheral areas. Since the EPC, as has been shown, is, on balance, likely to penetrate faster in the central regions, the pattern of EPC penetration, and hence the parallel-currency approach, scores highly in this respect.

The same is true with regard to the third criterion, factor mobility. Currency unification acts to increase factor mobility within the unified area (the EPC domain) because costs of exchange, exchange risks, convertibility risks and currency information costs are all eliminated within the currency area. Thus currency unification is self-justifying - it is a precondition for its own optimality.

3.4.3. The Macroeconomic Efficiency of Exchange-Rate Adjustment

It has been argued that nominal exchange-rate variations are the less efficient in bringing about interregional adjustment and thus stable equilibrium, and that the loss of the exchange-rate instrument which currency unification implies is therefore the less costly, the more open the currency areas to be merged. The reason given is that exchange-rate illusion diminishes as openness increases. At the same time the efficiency of demand management in adjusting the balance of payments grows. It has been objected that under fixed exchange rates, openness implies at the same time an equivalent reduction in the efficiency of demand management with regard to price-level stabilisation: in short, open economies are in even greater need of the exchange-rate cushion in order to protect themselves against the importation of inflation and the exportation of price stability. Moreover, apart from such nominal exchange-rate adjustments, exchange-rate policy can serve to bring about real exchange-rate changes as long as there is still some exchange-rate illusion, however small, which can be exploited. Why, in those circumstances, give up the instrument of exchange-rate policy?

Both objections, while valid in the usual case, fail to apply to currency unification through a parallel currency of constant EC purchasing power. Since the EPC will penetrate fastest in the most open member economies, it will protect them against inflation instead of depriving them of their protection. And since the EPC will mostly be demanded as a protection against inflation by people with little or no money and exchange-rate illusion, it does not prevent the national member governments from exploiting the money and exchange-rate illusion which still persists.

3.4.4. The Resource Cost of Increased Exchange-Rate Transparency

Currency unification facilitates international price comparisons. By reducing these information costs it is likely to encourage demands for "pay parity" within the unified area, even where "productivity parity" does not exist. If workers in low-productivity regions demand and obtain a reduction in the real-wage differential vis-à-vis workers in high-productivity regions which is not justified by a corresponding reduction of the productivity differential, unemployment in the backward regions will rise. This resource cost of currency unification will be the smaller, the more similar the (marginal value) productivity (of labour) and productivity growth, respectively, in the regions of the unified currency area.

As should be expected from the theory of regional economics, the backward areas in the European Community are the peripheral regions; the central regions in which the EPC, as has been shown, should spread in the first place, are the most industrialised. Hence the parallel-currency approach would help to delay the disadvantages of currency unification. By destroying money illusion with wage earners (i.e. by reducing the "wage lag") in the industrial centre, the EPC of constant EC purchasing power may in fact help to raise real wages in the centre as compared with real wages at the periphery and thus be an instrument of regional policy.

3.4.5. The Theory of the Optimum Currency Area Made Operational

The analysis of the prospective process and the pattern of EPC penetration shows that the parallel-currency approach presents many characteristics of an optimal currency unification process. In particular, it is a way of im-

proving the pattern of currency areas during the transitional phase. While the theory of the optimum currency area has often been criticised as irrelevant because its object is to determine the best possible frontiers for a currency area rather than the desirability of unifying a given set of currency areas, the parallel-currency approach, by providing for shifts of the frontiers between the EPC domain, on the one hand, and the national currency areas, on the other, makes the theory of the optimum currency area operational.

4. Conclusion: The Parallel-Currency Approach in Monetary History

While the political future of the parallel-currency proposal does seem uncertain, it is interesting to note that on several occasions in the past it has successfully been adopted either to bring about currency unification or to deal with inflation. Within the Community, quite apart from the Hamburg Mark Banco, German monetary history in particular offers a number of striking examples:

- In 1838, four years after the foundation of the German Customs Union, the Dresden Coin Convention agreed to create a Union coin (2 Thaler) which circulated side by side with the national currencies.
- In 1857, the Vienna Coin Treaty provided for three more union coins (one Crown, half³Crown and one Thaler) and extended their circulation to Austria. Especially the union Thaler coins soon outcompeted the state coins which, over the period up to the forcible monetary unification of Germany in 1871, accounted for less than 3 percent of the total coin issue.
- In 1923, the German government created a parallel currency of constant gold value backed by real assets, the so-called Rentenmark, which made substantial inroads into the circulation of the hyperinflating Reichsmark until the latter was stabilised. The Rentenmark was preceded by public and private issues of Emergency Money of guaranteed purchasing power.

Europe's present parallel currency, though an inflating one, is the Eurodollar. It owes this role to the choice of the market. This is also how the (Spanish) Dollar (=Thaler) became the North American parallel currency in the 18th century. Following the outbreak of the Revolutionary War, Congress introduced dollar bills (the "continentals") as a parallel legal tender besides Sterling (1775) and, in 1785, declared the dollar "the money unit of the United States of America" while in most member states Sterling was still the dominant unit of account, while Sterling notes were still issued in them and while many foreign coins remained in circulation. Strictly speaking, the dollar remained a parallel currency for the United States until 1857 when all foreign currencies were deprived of the status of legal tender. And it became a parallel currency in other countries - very soon in Canada and, in the form of the "trade dollar" (1873), in international transactions.