# Competing Currencies: The Case for Free Entry* **

By Roland Vaubel

After a brief overview of existing barriers to competition from private and foreign public money suppliers, the main arguments in favour of such barriers are analyzed and criticized. The concluding section surveys current forecasts of the monetary arrangements that would develop in conditions of free entry, and questions some of them.

## I. Barriers to Currency Competition

Currency competition for the established national central banks can come from foreign central banks or from private money suppliers (at home or abroad). At present, currency competition from both sources is severely restricted in many countries, especially in the Federal Republic of Germany.

Currency competition from *foreign central banks* can be restricted in several ways:

— the currency issued by the national central bank can be prescribed as a private unit of account[1];

— contracts in foreign currencies can be prohibited by law or discouraged through discriminatory contract enforcement in the courts[2];

— governments can restrict or discourage the holding of foreign currencies by residents (or the holding of the domestic currency by foreigners) and thereby interfere with the choice of means of payments;

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[1] For instance, the national currency is prescribed for the denomination of company capital in W. Germany, France, United Kingdom and for all obligations which enter the land register (W. Germany, France) or which have to be notarized (Belgium, France).

[2] In the United Kingdom, for example, the courts do not award foreign currency claims if the contract has been concluded between residents or in a "third" currency.

— governments can refuse to accept any other currency than the one issued by their central bank.

In the Federal Republic, residents are free to hold foreign currencies (notes, coins, deposits) in unlimited amounts, but contracting in foreign currencies or international currency units (like the European Currency Unit) is restricted more severely than in any other major industrialized country[3]. The most far-reaching plan to admit a foreign currency (the US dollar) on equal terms was recently put forward by Yoram Aridor, Minister of Finance of Israel; his plan was rejected, and he had to resign.

Currency competition from *private money suppliers* is not admitted in any industrial country, but there have been many instances of such competition in monetary history (including German monetary history)[4]. To the extent that money may be issued by private enterprises at all, it must be denominated in the currency issued by the central bank. Moreover, with minor exceptions, private enterprises are not permitted to issue currency (notes and coins). Their supply of deposits is subject to reserve requirements and many other regulations.

In the Federal Republic of Germany, currency competition from private money suppliers is also suppressed most severely because the Bundesbank uses § 3 II Währungsgesetz to prohibit even DM deposits whose value is linked to a price index[5]. According to § 35 I Bundesbankgesetz, the unauthorized issuance of coins, notes or other certificates that are suited to be used as means of payments instead of the legally permitted coins and notes, and the unauthorized issuance of non-interest-bearing bearer securities can be punished with fines or imprisonment of up to five years, even if the competing money is not denomi-

[3] § 3 I of the German Währungsgesetz (enacted by the Allied Military Government on June 20, 1948) stipulates that all foreign currency contracts are subject to licencing by the authority responsible for foreign exchange controls. § 49 of the German Außenwirtschaftsgesetz specifies that this provision applies only to contracts between residents (I) and that applications for permission have to be submitted to the Deutsche Bundesbank (II). The rules which the Deutsche Bundesbank follows in permitting or prohibiting foreign-currency contracts between residents have been published in Bundesanzeiger No. 169, Sept. 12, 1969, and in Monatsberichte der Deutschen Bundesbank, April 1971, 29. As a rule, the Bundesbank does not permit foreign-currency contracts between residents unless they are directly connected with international contracts.

[4] See *Vaubel* (1978 a), 387 - 400. During the German hyperinflation of 1922 - 1924, for example, private enterprises issued inflation-proof emergency notes in competing currency units. In mid-November 1923, inflation-proof emergency money was issued by about 500 institutions and accounted for 37 per cent of the currency in circulation.

[5] The Bundesbank authorizes certain types of indexed contracts (in 1982 in 34.096 cases) but it does not permit the issuance of indexed monetary or capital market instruments.

nated in Deutsche Mark. The Bundesbank's domestic monopoly in the production of base money is not prescribed by the German Constitution. Art. 88 of the Grundgesetz merely obliges the Federal Government to establish a central bank that supplies money[6].

The existence of these barriers to entry raises three questions:

— What welfare-theoretic grounds are there to justify restrictions of currency competition from foreign central banks?

— If there is a case for free currency competition from foreign central banks, why doesn't this case extend to private banks as well?

— If private banks should be free to supply currencies of their own, why should the government (its central bank) supply money, or a monetary unit of account, at all?

These questions are the topics of the following three sections.

## II. The Case for Free Currency Competition among Central Banks

The standard argument against barriers to entry is that they narrow the consumers' freedom of choice and that they raise the price, and reduce the supply and the quality, of the product in question. Prima facie, an increase in "price" and decrease of supply may seem to be desirable in the case of money. Do not a smaller supply and a higher "price" of money imply less inflation? This is a fallacy, for the argument confuses the price of acquiring money (the inverse of the price level) with the price (opportunity cost) of holding money[7] and overlooks the fact that holding demand for money is a demand for real balances. Since money is an asset to be held, demand for it depends on the price of holding it. The yield foregone by holding a money that bears no interest or is subject to non-interest bearing reserve requirements, is larger, the higher the expected inflation rate. An inflation-prone central bank loses real money demand to less inflation-prone foreign central banks[8]. In this way, it loses both revenue and its power to affect the national economy through monetary policy. Thus, the removal of barriers to entry encourages less inflationary monetary policies. In real terms, the standard case against barriers to entry applies to the product money as well: the removal of barriers raises the *real* quantity of money and reduces the relative price of *holding* it.

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[6] For this view see notably *Suhr* (1982), 102 f.

[7] *Johnson* (1969) has pointed out the same confusion in the work of *Pesek / Saving* (1967).

[8] In the absence of a forced or legal disequilibrium exchange rate, the less inflationary money prevails ultimately not only as a store of value but also as a means of payment. The conditions for the operation of "'Gresham's Law" are analyzed in *Vaubel* (1978 a), 82 - 89.

If the standard case for competition applies, it implies not only removal of barriers to entry but also prevention of collusion among the public producers of money. Collusion is the international coordination of monetary policies[9]. In the extreme case, it takes the form of fixed exchange rates, an international holding-price cartel among money producers[10].

Competition among central banks reduces inflation in at least three ways:

1. *"Exit"*[11]: the world demand for money shifts from the currencies that are expected to depreciate and to be risky to currencies that are expected to appreciate and to be more stable.
2. *"Voice"*[11]: even if exit does not help, public opinion in the more inflation-ridden countries is impressed by the example of the less inflation-ridden countries. It makes the government (the central bank) responsible for its inferior performance. In politics, too, competition works as a mechanism of discovery and imitation.
3. *Acceleration Effect:* even in the absence of exit and voice, an inflationary monetary impulse in one country affects the price level faster than a simultaneous monetary expansion of equal size that is common to all, or several, countries. This is because the uncoordinated national monetary impulse affects the exchange rate, and to that extent the price level, almost immediately. By rendering the causal connection between money supply and price level more transparent, international currency competition reduces the likelihood of inflationary monetary policies.

In spite of these beneficial effects, free entry and, more generally, international currency competition are not usually advocated by national central banks, not even by the competitive ones. The Bundesbank, for example, launched a campaign in 1979 to convince the German public and foreign monetary authorities that everything had to be done to prevent the mark from taking over a larger part of the dollar's position as an international currency, especially as an official reserve currency. The Bundesbank gave three main reasons for its policy stance[12]:

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[9] For a critical analysis of the welfare-theoretic arguments in favour of monetary-policy coordination see *Vaubel* (1983). *Vaubel* (1978 b) shows that, in 1969 - 1977, the average rate of European monetary expansion has always been negatively correlated with the dispersion of national rates of monetary expansion in the seven main countries.

[10] For a more detailed exposition see *Vaubel* (1978 a), 33 f.

[11] This is the terminology of *Hirschman* (1970).

[12] *Deutsche Bundesbank* (1979), Nov., 33: "The Deutsche Mark as an International Investment Currency" (Monthly Report). In a more recent article

1. "Owing to the limited capacity of our money and capital markets there would from the outset be a danger of the investment or withdrawal ... of DM reserves consistently putting an undue strain on the viability of these markets. This would entail fluctuations in liquidity and interest rates which would not be desirable for the domestic economy and which the Bundesbank would not always be able to offset. ... Germany's economic policy makers would eventually be faced with the choice either of allowing the exchange rate of the DM to rise consistently faster than was justified by the inflation differential and tolerating the resultant shifts in the structure of the domestic economy (which would have disastrous economic policy consequences ...) or of restraining the movement of the exchange rate ... which would entail the risk of an inflationary expansion of the domestic money stock".
2. "Compared with the risks ... the possible advantages for a country (such as) Germany ... are rather questionable ... In the case of Germany ... the view that the country of issue ... derives seigniorage from its reserve role ... would be a highly theoretical notion. On the one hand, the assets held in DM would normally bear a considerable real rate of interest and therefore not be without cost. On the other, the reserve role of a currency is incompatible in the long run with deficits on current account ... Sustained large-scale current account deficits would very soon lead to a loss of confidence and thus preclude the build-up of a reserve currency from the start. So far Germany has derived no significant real economic benefit from the investment of monetary reserves in DM, if only because the German current account has almost always been in substantial surplus. ... Germany has thus relieved the diversifiers of the exchange risk on their dollar assets without receiving any quid pro quo."
3. "A 'system' of several reserve currencies, such as would be the outcome of an unrestrained diversification process, would be a highly unstable structure, exposed to the risks of constant exchange rate unrest and uncontrolled development of international liquidity. ... The limitation of the reserve role of the DM is therefore not only in the German interest; it seems to be desirable from an international point of view as well."

The first argument is correct in pointing to the greater difficulty of planning monetary expansion under currency competition. If the demand for money shifts among currencies, a simple x per cent rule for monetary expansion is not likely to be adequate. The forward premium and a world portfolio growth variable will have to be included in the money demand function[13], or the monetary target has to be formulated for the "world" money supply or some proxy thereof[14]. However, even if international shifts in the demand for money are not correctly identified, they will hardly have "disastrous consequences"; for their real

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under the same title, the Bundesbank calls foreign holdings of DM assets "neither too large nor too small" (Monthly Report, January 1983, 13 of the German edition).

[13] For a theoretical and econometric implementation of this approach see *Vaubel* (1980).

[14] See the proposal by *McKinnon* (1983).

exchange rate effects do not last longer than the lag of price-level adjustment. They are strictly temporary.

More generally, the argument reveals a high degree of risk aversion. The Bundesbank's attitude resembles that of a (non-?)banker who refuses to accept deposits because banking involves intermediation risk. Still more generally, it resembles that of a (non-?)entrepreneur who refuses to produce (for example, money) because he may miss the optimal output. Even a spatial monopolist who would be competitive in the world market may dislike competition because he prefers a quiet life.

Second, as for the benefits for Germany, is it true that Germany would not earn more external seigniorage? Seigniorage gains are by no means confined to the issuers of assets that do not bear interest. Seigniorage is the "monopoly" profit from the production of money. Any money producer who faces a less than perfectly elastic demand for his product — that is, for whose product there are no perfect substitutes — can gain seigniorage. An increase in foreign demand for its currency or assets denominated in its currency enables the issuing country to borrow at a lower cost — that is, at a lower real interest rate — from foreign savers than it otherwise could[15]. The extent to which the increase in net short-term capital imports leads to an increase of private long-term capital exports or to an increase in net imports of goods is irrelevant to the seigniorage issue. An increase in income is an increase in income regardless of whether it is consumed or saved.

The extent to which the increase in foreigners' liquid DM claims on German residents would be offset by additional German next exports of capital or by additional German net imports of goods and services etc., would not affect international confidence in the mark if the Bundesbank limits the increase in DM supply to the increase in the demand for real DM balances.

Third, is international currency competition undesirable from an international point of view? It disciplines those who try to supply their product at too high a price. If international shifts in the demand for money have been responsible for the dollar's and sterling's weakness in the 1970s and for the weakness of the French Franc in 1981 - 83, they have played a crucial role in bringing about a correction. International shifts in the demand for money are not the cause of monetary instability but its consequence and symptom. They are part of the corrective feedback mechanism.

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[15] In other words, its "terms of finance" improve.

Why then do even central banks that would be competitive object to international currency competition? It is tempting to adopt a public-economics approach: the benefits of currency competition accrue to private money holders and users (lower inflation tax and inflation risk) and to domestic taxpayers (larger external seigniorage), but the cost, the greater difficulty of determining the optimal rate of monetary expansion, has to be borne by the central bankers. After all, bureaucrats tend to be held responsible for the errors they commit rather than for the opportunities they miss.

## III. Currency Competition from Private Suppliers: The Case for Free Entry

If free currency competition between the central banks of different countries has the salutary effect of reducing rates of inflation below the monopolistic rates, it is difficult to see why the case for a competitive supply of money should not also extend to competition from private banks of issue. From a present-day perspective, the suggestion of an unrestricted competitive supply of (distinguishable[16]) private high-powered money must be regarded as truly (counter-)revolutionary, and even Hayek needed more than half a year to proceed, in 1976, from the demand for "free choice in currency" to the case for the "denationalisation of money".

Several justifications have been given for the prohibition of currency competition from private suppliers:

1. Profit-maximizing private issuers would increase the supply of their money until its price equals the marginal cost of producing it, namely zero; the result would be hyperinflation[17].

2. Private competitive supply of money renders the price level indeterminate[18].

3. The private banking system is inherently unstable.

4. Monopolistic production of money by the state is an efficient way of raising government revenue.

5. The supply of money is a natural monopoly because of economies of scale in production or use.

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[16] See *Klein* (1974).

[17] See *Lutz* (1936), 4 f., *Friedman* (1959 a), 7; (1969), 39, *Pesek/Saving* (1967), 129, *Johnson* (1968), 976, *Meltzer* (1969), 35 and *Gehrig* (1978), 454. This view has been criticized by *Klein* (1974), 428 - 31, *Vaubel* (1977), 449 - 52 and *Girton/Roper* (1981), 21 - 24.

[18] *Gurley/Shaw* (1960), 255 ff., *Patinkin* (1961), 116 and *McKinnon* (1969), 316.

6. Money exerts positive external effects; money, or the currency unit, may even be a public good.

The first argument repeats the confusion noted above: it mistakes the price of acquiring money for the price (opportunity cost) of holding money. What private profit maximization reduces to almost zero is not the value of money but the opportunity cost of holding it.

Some authors have objected that private suppliers of money may choose to maximize their short run profits rather than their long run profits, thus opting for hyperinflation at the time of their greatest success, when the present value of their confidence capital is at its maximum. Klein (1974, p. 449) and Tullock (1975, pp. 496 f.) have replied that private enterprises tend to have a longer planning horizon than democratically elected governments and their central banks. However, this answer implies that central banks act as profit maximizers as well — in some cases a debatable assumption. The answer is rather that, if there is a danger of "profit snatching", money holders will prefer currencies that offer value guarantees. This point will be further developed in the concluding section.

The second argument is correct in pointing out that the price level is indeterminate — indeed, under any system of money production, for the initial supply of nominal balances is an arbitrarily chosen number. To serve as an objection to private currency competition, the argument would have to show that the rate of change of the price level is indeterminate as well under such a system.

The third argument may justify money production by governments, but it does not justify barriers to entry. Whether claims on the private banking system are excessively risky is a question which each money holder can be left to decide on his own depending on his individual degree of risk aversion.

Fourthly, even if a system of optimal taxation requires a tax on money balances in addition to the wealth tax, what reason is there to assume that the collection of government seigniorage is more efficient than the taxation of private money creation or of private money holdings?

Fifthly, if money is a natural-monopoly good, the central bank does not need a legal monopoly (although it may have to be subsidized[19]).

[19] Subsidies may be justified even if marginal cost pricing is not the aim (because the additional taxation required would create excessive distortions elsewhere in the economy). They may be justified if the natural monopolist has passed the point of minimum average cost; for in this exceptional case, which *Sharkey* (1982), Ch. 5 has emphasized, an efficient natural monopolist

Since we do not even know whether money is a natural monopoly good and what its optimal characteristics are (for instance, whether it should be of stable or increasing purchasing power), barriers to competition from private issuers prevent us from finding out; the mechanism of discovery is blocked. A governmental producer of money is not an efficient natural monopolist unless he can prevail in conditions of free entry and without discrimination[20]. Historically, the major central banks have not acquired their national monopoly position in this way[21].

Finally, if money exerts positive external effects or is even a public good, there may be a case for subsidization, or even for governmental production, of money, but not for barriers to entry. The private supply of money would be too small, not too large.

## IV. Should Governments Supply Money?

The previous section has shown that governmental production of money may be justified, if (i) the private banking system is inherently unstable, and/or if money is a (ii) natural-monopoly good or (iii) a public good. Whether arguments (i) and (ii) apply is an empirical question which cannot be answered as long as free currency competition from private issuers is not permitted[22]. Monetary history does not provide a clear answer[23]. Whether money is a public good, as has often been claimed, is largely a matter of definition and needs to be clarified[24].

There is no generally accepted definition of a public good. However, most authors seem to consider non-rivalness a necessary and sufficient

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may be unable to produce the optimal quantity of output and to sustain himself against less efficient competitors if the government does not pay him a subsidy (which it should offer to all producers who supply at least as much output). Under Sharkey's assumptions, the subsidy must be sufficient to keep the net-of-subsidy average cost of the most efficient supplier of optimal output at the minimum average cost attainable for any smaller quantity of output.

[20] Non-discrimination also implies that the government is willing to accept or pay any currency preferred by its private counterpart. Otherwise, a superior private money may not prevail in the market, merely because the government uses only its own money.

[21] The Bank of England, for example, was granted its monopoly not because it was gaining ground in the market but because it was losing out to the other joint-stock issuing banks which had emerged after the Bank's joint-stock monopoly had been abolished in 1826 (for details see *Vaubel* (1978 a), 389).

[22] For an econometric test of the natural-monopoly hypothesis and for a list of previous studies of this issue see *Vaubel* (1984). The results are not conclusive.

[23] *Vaubel* (1978 a), 387 - 401.

[24] The remainder of section IV is adapted from *Vaubel* (1984).

condition[25]. Others regard non-excludability as an alternative sufficient condition[26]. A few treat the term public good as synonymous with positive consumption externality[27].

In this paper we shall retain the benefit of being able to distinguish between the general concept of consumption externality and the polar case of a (pure) public good which, in terms of production units, is equally available to all members of the group in a quantity or quality that is independent of the size of the group (non-rivalness)[28]. We shall call a free good a good for which exclusion is not profitable (non-excludability). More limited consumption externalities have been discussed in Vaubel (1984).

One group of authors ascribe a public good nature to money because "any one agent, holding cash balances of a given average size, is less likely to incur the costs of temporarily running out of cash, the larger are the average balances of those with whom he trades"[29]. However, money balances do not satisfy the non-rivalness criterion (nor the non-excludability criterion): as long as one person holds a unit of money and benefits from its "liquidity services", nobody else can own it and benefit from it. If he gives it away, he increases his own risk of temporarily running out of cash. Therefore, he will ask for a quid pro quo — a good, service or some other asset.

For the same reason, it is not true that "the provision of a convertible currency is an international 'public good'" because "a convertible currency can be held and used by foreigners"[30] or that "the dollar is an 'international public good'" because "the United States provides the world's reserve currency"[31]. Otherwise, any exportable good or asset which happens to be supplied by a government would be an international public good.

*Kindleberger* refers to "the public good provided by money as a unit of account"[32] and "standard of measurement"[33] and applies the term public good to "money"[34], "international money"[35], "an international

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25 The seminal modern contribution is *Samuelson* (1954).
26 See notably *Musgrave* (1959), 9.
27 *Samuelson* (1969).
28 This is essentially *Buchanan's* definition (1968), 54.
29 *Laidler* (1977, pp. 321 f.). A similar view seems to be taken by *Kolm* (1972, 1977) and *Mundell* (*Claassen/Salin*, (1972), 97).
30 *McKinnon* (1979), 3.
31 *Schmidt* (1979), 143.
32 *Kindleberger* (1972), 434.
33 *Ders.*, (1983), 383.
34 *Ders.*, (1978 a), 9 - 10.
35 *Ders.*, (1976), 61; (1978b), 286.

unit of account" and "international monetary stability"[36]. International monetary stability in the sense of stability of purchasing power or exchange rate stability is not a good but a quality characteristic of the product money. Quality charateristics, it is true, meet the non-rivalness test: enjoyment by one does not detract from enjoyment by others (nor can they be excluded from them) provided they have bought the good itself. However, this applies to the quality characteristics of all goods. If the publicness of its characteristics made a good a public good, all goods that are sold to more than one person would be public goods.

It might be argued that the benefits of a unit of account (and a price index) can be enjoyed by a person independently of whether he holds and uses the money which it denominates[37]. More specifically, a person or organisation, by adopting a certain unit of account (and by publishing a price index for it), may convey information, a public good, to all others. This would imply that government should suggest a unit of account and publish a price index for it, but not that it should supply money, let alone the only (base) money[38] or monetary unit.

*Brunner* and *Meltzer*[39] have emphasized that money itself is a substitute for information because it also reduces transaction costs, and because transaction costs can largely be reduced to the costs of information about possible transaction chains, asset properties and exchange ratios between assets. Since money is a substitute for information and since information is a public good, *Hamada*[40] and *Fratianni*[41] conclude, there is a "public good nature of money". However, to show that X is a substitute for a public good is not sufficient to prove that X is a public good. A fence, a dog and an alarm system are all to some extent substitutes for police protection but they are not public goods. What has to be shown is not that money is a substitute for information but that it provides the public good of information.

Several authors have argued that "public consensus" or "social agreement" on a common money is a way of creating generally useful knowledge and is thus a public good[42]. The knowledge in question is the predictability of individual behavior. What becomes predictable is not

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[36] *Ders.*, (1972), 435.
[37] *Yeager* (1983), 321.
[38] This conclusion is in fact reached by *Engels* (1981), 10f., *Hall* (1981), 21, and *Yeager* (1983), 324 f.
[39] *Brunner/Meltzer* (1964), (1971).
[40] *Hamada* (1979), 7.
[41] *Fratianni* (1982), 437.
[42] *Hamada* (1977), 16, *Frenkel* (1975), 217, *Tullock* (1976), 524, *Tobin* (1980), 86 - 87 and, with respect to the unit of account, *Hall* (1983), 34, and *Stockman* (1983), 52.

only the money which each individual accepts but also that each individual in the country accepts the same money.

Public decisions by definition meet the non-rivalness test. However, not all public decisions are public goods — they can be public bads[43]. Since the aim of securing predictability of individual trading behavior, if taken to the extreme, may serve to justify the most far-reaching central planning by an omnipotent government[44], the mere fact that a certain act of government generates knowledge is not a sufficient justification. It has to be shown that the knowledge in question is worth its cost and that it is provided more efficiently by the government than by a competitive private sector. Both contentions are controversial.

The only operational proof that a common money is more efficient than currency competition and that the government is the most efficient provider of the common money would be to permit free currency competition. Whether the imposition of a common money or monetary unit is a public good or a public bad depends on whether money is a natural-monopoly good or not[45]. Hence, there is no independent public-good justification for the government's money monopoly. The public good argument is redundant.

## V. Forecasting Monetary Arrangements under Free Currency Competition

If currency competition is to serve as a mechanism of discovery, government must not prescribe the characteristics of the privately issued currencies nor the organisation of the private issuing institutions. Contrary to some proposals[46], for example, it must not prescribe the monetary unit of account nor the types of assets that may be held by the issuing institutions.

Refusal to prescribe specific arrangements does not prevent us from trying to forecast monetary arrangements under free currency competi-

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[43] *Tullock* (1971).

[44] *Hirshleifer* (1973), 132.

[45] Currency competition might even be desirable if the process were known to converge to the government's money; for the government may not know in advance what type of money to converge to: "The monopoly of government of issuing money ... has ... deprived us of the only process by which we can find out what would be good money" (*Hayek* (1978 b), 5).

[46] *Engels* (1981) suggests that the government "has the task of defining the monetary unit ... in terms of the market valuation of real assets ... and of securing the solvency of issuing banks" (pp. 9f.). *Hall* (1983) believes that private money must be denominated in an interest-bearing reserve certificate which is issued by the government and is indexed to the price level. For a critical review of Engels see *Vaubel* (1982 b).

tion; even *Hayek*[47] has done so. Hayek believes that private money would be stable in terms of "the prices of widely traded products such as raw materials, agricultural food stuffs and certain standardised semi-finished industrial products" (p. 71) and that "competition might lead to the extensive use of the same commodity base by a large number of issue banks" (p. 123). *Vaubel*[48] has suggested that "value guarantees ... are likely to be a necessary condition for acceptance of a competing money" and that "in the presence of unpredictable fluctuations in the determinants of the demand for money, value guarantees can only be maintained with precision and instantaneously, if they can be validated through exchange rate adjustment vis-à-vis another currency for which a price index is calculated". He believes that this reference currency, which cannot also be indexed (owing to the n-th currency problem), would be the money supplied and used by the government.

Another group of authors argues that the optimal money would appreciate relative to goods. Not all of them claim that the money which they regard as most efficient would also be most attractive to money users and prevail in the market, but this possibility should be considered. One variant is the so-called theory of the optimum quantity of money expounded by *Friedman* (1969), *Johnson* (1968), *Samuelson* (1963, 1969) and others; as *Mussa* (1977) has emphasized and criticized, it views money only as a store of value and ignores its standard of value function. According to another variant, which is due to *Alchian* and *Klein* (1973), the optimal monetary unit is stable in terms of a price index of all assets because the money cost of a given level of lifetime consumption utility ought to be held constant. Thirdly, *Engels* (1981) has recommended a real asset or pure equity standard because it would stabilize Tobin's q and thereby the business cycle. Engels suggests that such a unit would minimize the monetary risk for borrowers who invest in capital goods. However, the same is not likely to be true for all other debtors nor for all creditors. Finally, *Bilson* (1981) wants to transform money into an equity claim on a portfolio of real and nominal assets in order to render movements in the unanticipated rate of inflation countercyclical.

Whether privately issued money would appreciate relative to, or be stable in terms of, some composite of goods, cannot be predicted with certainty. However, experience with hyperinflation shows that the value of alternative monies, some of them private monies, tends to be linked to the price of one or more commodities. At times, e.g. in Germany in 1922/23, several commodity standards were used side by side.

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[47] *Hayek* (1978 a), 70 ff., 122 ff.
[48] *Vaubel* (1977), 451.

*Chen* (1975) reports a case in which this occurred over two centuries. Whether convergence toward a common standard of value and money is efficient and occurs depends on how similar the purchase and sale plans of different market agents are and how variable they expect the relative prices among commodities to be[49].

What assets are private issuing institutions likely to hold if they are not restricted by government? They would minimize their balance sheet risk by acquiring assets denominated in the money which they issue. The intermediation risk is zero in the case of equity or mutual-fund money, as suggested by Engels and Bilson. It is also zero in the case of commodity reserve money, however at the price of a zero real rate of return. The issuer of a money whose value is linked to a commodity price index can earn a positive real rate of return without incurring a monetary intermediation risk, if his assets are indexed as well; but he (and his creditors) cannot avoid a real intermediation risk. Thus, under free currency competition — even more than now — the composition of banks' assets will depend on the risk-yield preference trade-off of money users. Their degree of risk aversion is likely to differ, and it may vary over time. It cannot be reliably predicted — not even by governments.

**Summary**

In several respects, barriers to competition from private and foreign public money producers are higher in Germany than in any other major industrial country. The Bundesbank's defence of these barriers and the academic objections to currency competition are not convincing. The central bank's base money monopoly cannot be justified unless money is a natural monopoly good. In this case, however, there is no need for barriers to entry. Only if entry is free can we find out whether money is a natural monopoly good and what type(s) of money the market needs.

**Zusammenfassung**

Die Marktzutrittsbeschränkungen für private und ausländische öffentliche Geldproduzenten sind in der Bundesrepublik in mancherlei Hinsicht gravierender als in den anderen großen Industrieländern. Die Argumente, mit denen die Deutsche Bundesbank und zahlreiche Wissenschaftler derartige Beschränkungen verteidigen, sind bei näherem Hinsehen nicht überzeugend. Das Geldbasismonopol der Zentralbank kann nur dann gerechtfertigt sein, wenn Geld ein natürliches Monopolgut ist. In diesem Fall sind Marktzutrittsbeschränkungen überflüssig. Nur bei freiem Marktzutritt kann sich zeigen, ob Geld ein natürliches Monopolgut ist und was für Geld der Markt braucht.

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[49] See *Vaubel* (1978 a, 1982 b).

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