

LIFE AT THE TOP: INTERNATIONAL CURRENCIES IN  
THE 21<sup>ST</sup> CENTURY

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ABSTRACT

*What are the prospects for today's top international currencies in the twenty-first century? This paper explores how the future of the top currencies—the dollar, euro and yen—will be influenced by three key considerations: the logic of market competition, the strategic preferences of national governments, and prospective technological developments. Analysis suggests little near-term threat to the predominance of today's top currencies, though relative standing could be substantially altered by market competition and policy rivalry among issuing authorities. The supremacy of the dollar will be seriously challenged by the euro; the position of the yen, by contrast, is likely gradually to erode over time in a manner reminiscent of sterling's long decline in an earlier era. Over the longer term, however, stretching farther into the next century, technological developments could lead to the creation of entirely new rivals to today's top currencies: various innovative forms of money based on digital data—collectively known as electronic money—which will eventually begin to substitute in one way or another for bank notes and checking accounts as customary means of payment. Some of these new electronic monies could eventually hold more market appeal than any of today's top international currencies.*

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One of the most remarkable developments in global monetary relations at century's end is the rapid acceleration of cross-border competition among currencies – a spreading, market-driven phenomenon that in my recent book, *The Geography of Money* (Cohen 1998), I called the *detritorialization* of money. Circulation of national currencies is no longer confined within the territorial frontiers of nation-states. A few popular currencies, most notably the U.S. dollar and Germany's Deutschmark (the DM, now being succeeded by the euro), have come to be widely used outside their country of origin, vying directly with local rivals for both medium-of-exchange and investment purposes. Competition is intense; and as in most competitions, success is largely a matter of survival of the fittest.

The result is a fundamental transformation of the *geography* of money: the broad configuration of global currency space. Where once existed a familiar landscape of relatively insular national monetary systems – in effect, a simple map of neatly divided territorial currencies – monies now have become both more entangled and more hierarchical. My image for this new geography is the Currency Pyramid: narrow at the peak, where the strongest currencies dominate; and increasingly broad below, reflecting varying degrees of competitive inferiority. Position in this complex multi-tiered topography reflects the range of each money's *authoritative domain* – the limit of its effective use and authority. The more widely a money is used, either at home or abroad, and the greater its direct or indirect influence over currencies elsewhere, the higher is its ranking in the Currency Pyramid. High rank, in turn, implies power and prestige for a few and more constrained policy options for many others. Highest standing is enjoyed by the dollar, whose use predominates for most if not all cross-border purposes. Closest competition presently comes from the euro – newly created by Europe's Economic and Monetary Union (EMU) — and the Japanese yen, though neither as yet can claim anything like the universal appeal of America's greenback.

What are the prospects for today's top international currencies in the twenty-first century? The purpose of this paper is to take an objective new look at that critical question, with particular emphasis on factors most likely to influence the rivalry and rank of the top currencies over time. I begin with a few basic statistics on cross-border currency use, to put the discussion in perspective. I then explore how the future of the top currencies may be influenced by three key considerations: the logic of market competition, the strategic preferences of national governments, and prospective technological developments. Analysis suggests little near-term threat to the predominance of today's top currencies, though relative standing could be substantially altered by market competition, in turn leading to intensified policy competition among issuing authorities. Over the longer term, however, stretching farther into the next century, technological developments could lead to the creation of entirely new rivals to today's top currencies, transforming the geography of money virtually beyond recognition.

## 1. INTERNATIONAL CURRENCIES

Currencies may be employed outside their country of origin for either of two purposes – for transactions either between nations or within foreign states. The former is conventionally referred to as “international” currency use (or currency “internationalization”); the latter is described by the term “currency substitution” and can be referred to as “foreign-domestic use.” The top international monies are widely used for both purposes.

Both currency internationalization (CI) and currency substitution (CS) are a product of intense market rivalry — a kind of Darwinian process of natural selection, driven by the force of demand, in which some monies such as the dollar, DM, and yen come to prevail over others for various commercial or financial purposes. Though cross-border use is known to be accelerating rapidly, its full dimensions cannot be measured precisely in the absence of comprehensive statistics on global currency circulation. Partial indicators, however, may be gleaned from a variety of sources to underscore the impressive orders of magnitude involved.

The clearest signal of the accelerated pace of CI is sent by the global foreign-exchange market where, according to the Bank for International Settlements (1999), average daily turnover has accelerated from \$590 million in 1989 (the first year for which such data are available) to \$1.5 trillion in 1998 — a rate of increase in excess of 25 percent per annum. The dollar is the most favored vehicle for currency trading worldwide, appearing on one side or the other of some 87 percent of all transactions in 1998 (little changed from its 90 percent share in 1989). The DM appeared in 30 percent of transactions and the yen in 21 percent. The dollar is also the most favored vehicle for the invoicing of international trade, where the greenback has been estimated to account for nearly half of all world exports — more than double America’s share of world exports alone (Hartmann 1998). The DM share in recent years was fifteen percent; the yen’s share, five percent.

A parallel story is evident in international markets for financial claims, including bank deposits and loans as well as bonds and stocks, all of which have grown at double-digit rates for years. Using data from a variety of sources, Thygesen *et al.* (1995) recently calculated what they call “global financial wealth”: the world’s total portfolio of private international investments. From just over \$1 billion in 1981, aggregate cross-border holdings quadrupled to more than \$4.5 billion by 1993 — an expansion far faster than that of world output or trade in goods and services. Again the dollar dominated, accounting for nearly three-fifths of foreign-currency deposits and close to two-fifths of international bonds. The DM accounted for 14 percent of deposits and 10 percent of bonds; the yen, 4 percent of deposits and 14 percent of bonds.

The clearest signal of the accelerated pace of CS is sent by the rapid increase in the physical circulation of these same currencies outside their country of origin. For the dollar, an authoritative study by two Federal Reserve economists (Porter and Judson 1996) puts the value of US bank notes in circulation abroad at between

55 and 70 percent of the total outstanding stock — equivalent to perhaps \$250 billion in 1995. The same study also reckons that as much as three-quarters of the annual increase of U.S. notes in recent years has gone directly abroad, up from less than one-half in the 1980s and under one-third in the 1970s. Appetite for the greenback appears to be strong and growing. Using a comparable approach Germany's Bundesbank (1995) has estimated Deutschmark circulation outside Germany, mainly in East-Central Europe and the Balkans, at about 30 to 40 percent of total stock, equivalent to some DM 65-90 billion (\$45-65 billion) at end-1994. The Deutschmark's successor, the euro, is confidently expected to take over the DM's role in foreign-domestic use once euro notes enter circulation in 2002 and perhaps even to cut into the dollar's market share. And similarly, on the other side of the world, Bank of Japan officials have been privately reported to believe that of the total supply of yen bank notes, amounting to some \$370 billion in 1993, as much as ten percent may be located in neighboring countries (Hale 1995). Combining these diverse estimates suggests a minimum foreign circulation of the top currencies of at least \$300 billion in all — by no means an inconsiderable sum and, judging from available evidence, apparently rising rapidly.

The evidence also appears to suggest that a very wide range of countries is affected by the phenomenon, even if the precise numbers involved remain somewhat obscure. According to one authoritative source (Krueger and Ha 1996), foreign bank notes in the mid-1990s accounted for twenty percent or more of the local money stock in as many as three dozen nations inhabited by at least one-third of the world's population. The same source also suggests that, in total, as much as one-quarter to one-third of the world's circulating currency was recently located outside its country of issue.

These numbers clearly confirm the growing importance of both international and foreign-domestic use of the top international currencies for both medium-of-exchange and store-of-value purposes. Most prominent, obviously, is the dollar, which remains by far the world's most popular choice for both CI and CS. In effect, the greenback's authoritative domain spans the globe, from the Western Hemisphere to the former Soviet bloc and much of the Middle East. In all these regions, dollars circulate widely as a *de facto* parallel currency. Next is the DM, now being replaced by the euro, which is pre-eminent in monetary relations in much of the European neighborhood. And in third place is the yen, albeit at somewhat of a distance behind the first two. At the peak of the Currency Pyramid today, these three monies — the Big Three — plainly dominate.

## 2. MARKET COMPETITION

But what of tomorrow? Will the Big Three continue to dominate, or can significant changes be expected? Broadly speaking, life at the top will be influenced most by three key considerations: the logic of market competition, the strategic preferences of national governments, and prospective technological developments. All three factors suggest that substantial new transformations in the geography of

money are in the making.

Consider first the logic of market competition. Today's Big Three dominate, first and foremost, because they are (or have been) attractive to market participants for a variety of monetary purposes. If we learn anything from the history of money, however, it is that monetary attractiveness can change – and with it, the relative standing of individual currencies. The past is littered with the carcasses of currencies that once dominated international commerce, from the Athenian drachma and later the Byzantine solidus (the bezant) to Florence's florin, Venice's ducat, the Dutch guilder, the Spanish (later Mexican) silver peso, and, most recently, Britain's pound sterling. Shakespeare's words are as apt for money as they are for monarchs: "Uneasy lies the head that wears the crown." What does the logic of market competition tell us about who is likely to wear the crown tomorrow?

## 2.1. Attributes of success

Begin with what makes a money attractive in the first place. The principal attributes required for competitive success in the international marketplace are familiar to specialists and hardly controversial. Three features stand out.

First, at least during the initial stages of a currency's cross-border use, is widespread confidence in a money's future value backed by political stability in the country of origin. Essentially this means a proven track record of relatively low inflation and inflation variability. High and fluctuating inflation rates increase the cost of acquiring information and performing price calculations. No currency is apt to be willingly adopted for international or foreign-domestic use if its purchasing power cannot be forecast with some degree of assurance.

Second are two qualities that I have elsewhere referred to as "exchange convenience" and "capital certainty" (Cohen 1971) — a high degree of transactional liquidity and reasonable predictability of asset value. The key to both is a set of well developed financial markets, sufficiently open to ensure full access by non-residents. Markets must not be encumbered by high transactions costs or formal or informal barriers to entry. They must also be broad, with a large assortment of instruments available for temporary or longer-term investment. And they must be deep and resilient, with fully operating secondary markets for most if not all financial claims.

Finally, most important of all, a money must promise a broad transactional network, since nothing enhances a currency's acceptability more than the prospect of acceptability by others. Historically, this has usually meant an economy that is large in absolute size and well integrated into world markets. A large economy creates a naturally ample constituency for a currency; economies of scale are further enhanced if the issuing country is also a major player in world trade. No money has ever risen to a position of international pre-eminence that was not initially backed by a leading economy. The greater the volume of transactions conducted in or with a given country, the greater are the potential network

externalities to be derived from use of its money.

Reiteration of these essential attributes permits two broad inferences. First, among currencies in circulation today, there seems no candidate with even the remotest chance in the foreseeable future of challenging the top rank presently enjoyed by the dollar, euro, and yen. Second, among the Big Three, there seems a very real chance of significant shifts in relative market standing.

## 2.2. No new challengers

The first inference follows logically from observable fact. We know that there is a great deal of inertia in currency use. Recall, for instance, how long it took the dollar to supplant the pound sterling at the top of the Currency Pyramid even after America's emergence a century ago as the world's richest economy. As Paul Krugman has commented: "The impressive fact here is surely the inertia; sterling remained the first-ranked currency for half a century after Britain had ceased to be the first-ranked economic power" (Krugman 1992: 173). Similar inertias have been evident for millennia, in the prolonged use of such international moneys as the bezant and silver peso long after the decline of the imperial powers that first coined them. Such immobilism seems very much the rule, not the exception, in currency relations.

Inertia is promoted by two factors. First is the pre-existence of an already well established transactional network, which confers a certain natural advantage of incumbency. Switching from one currency to another necessarily involves an expensive process of financial adaptation. Considerable effort must be invested in creating and learning to use new instruments and institutions, with much riding on what other market agents may be expected to do at the same time. As attractive as a given money may seem, adoption will not prove cost-effective unless others appear likely to make extensive use of it too. In the words of economists Kevin Dowd and David Greenaway: "Changing currencies is costly — we must learn to reckon in the new currency, we must change the units in which we quote prices, we might have to change our records, and so on.... [This] explains why agents are often reluctant to switch currencies, even when the currency they are using appears to be manifestly inferior to some other" (Dowd and Greenaway 1993: 1180).

Second is the exceptionally high level of uncertainty that is inherent in any choice among alternative moneys. The appeal of any money, ultimately, rests on an intersubjective faith in its general acceptability — something about which one can never truly be sure. Uncertainty thus encourages a tendency toward what psychologists call "mimesis": the rational impulse of risk-averse actors, in conditions of contingency, to minimize anxiety by imitative behavior based on past experience. Once a currency gains a degree of acceptance, its use is apt to be perpetuated — even after the appearance of powerful new challengers — simply by regular repetition of previous practice. In effect, a conservative bias is inherent in the dynamics of the marketplace. As one source has argued, "imitation leads to the emergence of a convention [wherein] emphasis is placed on a certain

‘conformism’ or even hermeticism in financial circles” (Orléan 1989: 81-83).

Because of this conservative bias, no new challenger can ever hope to rise toward the top of the Currency Pyramid unless it can first offer a substantial margin of advantage over existing incumbents. The dollar was able to do that, in relation to sterling, once New York overtook London as the world’s pre-eminent source of investment capital – though even that displacement, as Krugman notes, took a half century or more. Today, it is difficult to find any money anywhere with a comparable promise of competitive advantage in relation to the present Big Three.

Some sources suggest a possible future role for China’s yuan, given the enormous size of the Chinese economy (already, by some measures, the second largest in the world) and its growing role in world trade. However broad the yuan’s transactional network may eventually become, though, the currency’s prospects suffer from the backwardness of China’s financial markets and still lingering uncertainties over domestic political stability – to say nothing of the fact that use of the yuan continues to be inhibited by cumbersome exchange and capital controls. Similar deficiencies also rule out the monies of other large emerging markets around the world, such as India or Brazil. Conversely the still independent currencies of more economically advanced countries like Switzerland or Canada —or even Britain— are precluded, despite obvious financial sophistication and political stability by the relatively small size of the economies involved. (Britain’s pound in any event is expected eventually to be absorbed into Europe’s monetary union.) Nowhere, in fact, does there seem to be any existing money with a reasonable chance of soon overcoming the powerful forces of inertia favoring today’s incumbents. For the foreseeable future, the dominance of the Big Three seems secure.

### 2.3. Relative shifts

Continued collective dominance, however, does not exclude the possibility of significant shifts in relative standing among the Big Three. At the top of the Currency Pyramid, the dollar today reigns supreme. But might that change? Could the greenback’s market leadership be challenged any time soon by either the euro or the yen?

Less probability may be attached to a successful challenge by the yen, despite Japan’s evident strengths as the world’s top creditor nation with an enviable record of success in controlling inflation and promoting exports. Cross-border use of the yen did accelerate significantly in the 1980s, during the glory years of Japanese economic expansion. Internationalization was particularly evident in securities markets, where yen-denominated claims were especially attractive to investors, and in bank lending. But the yen never came close to overtaking the popularity of the dollar, or even the DM, and was little used for either trade invoicing or CS. Moreover, its upward trajectory was abruptly halted in the 1990s, following the bursting of Japan’s “bubble economy,” and there seems little prospect of

resumption in the near term so long as Japanese domestic stagnation persists. In fact use of the yen abroad in recent years has, in relative terms, actually decreased rather than increased, mirroring Japan's economic troubles at home. The decline has been most dramatic in neighboring Asian countries, where bank loans and other Japanese investments have been rolled back dramatically. "The country's financial muscle in Asia is waning," reports the *New York Times*. "Japanese investment in the region may never be the same" (*New York Times*, December 26, 1999).

The biggest problem for the international standing of the yen is Japan's financial system, which despite recent improvements has long lagged behind American and even many European markets in terms of openness or efficiency. Indeed, as recently as two decades ago, Japanese financial markets remained the most tightly regulated and protected of any industrial nation, preventing wider use of the yen. Strict exchange controls were maintained on both inward and outward movements of capital, securities markets were relatively underdeveloped, and financial institutions were rigidly segmented. Starting in the mid-1970s, a process of liberalization began, prompted in part by a slowing of domestic economic growth and in part by external pressure from the United States. Exchange controls were largely eliminated, new instruments and markets were developed, and institutional segmentation was relaxed, doing much to enhance the yen's exchange convenience and capital certainty. Most dramatic was a multi-year liberalization program announced in 1996, dubbed the so-called Big Bang (in imitation of the swift deregulation of Britain's financial markets a decade earlier). But the reform process, as frequently noted (e.g., Schaefer 2000), still is by no means complete, and further progress is inhibited by the near-bankruptcy of many of Japan's largest banks and real-estate lenders. Yet without further progress the yen will remain at a competitive disadvantage relative to both the dollar and the euro. International traders and investors will have little incentive to bear the costs and risks of switching from either of the other top currencies to the yen. Indeed, if anything, the trend is more likely to continue moving the other way, toward gradual erosion of the yen's relative standing in a manner reminiscent of sterling's long decline in an earlier era.

More probability, by contrast, can be attached to a successful challenge by the euro, which is beginning life with most of the key attributes necessary for competitive success already well in evidence. Together, the eleven present member of EMU – familiarly known as "Euroland" — constitute a market nearly as large as that of the United States, with extensive trade relations not only in the European region but around the world. The potential for network externalities is considerable. Likewise, Euroland starts with both unquestioned political stability and an enviably low rate of inflation, backed by a joint monetary authority, the European Central Bank (ECB), that is fully committed to preserving confidence in the euro's future value. Much room exists, therefore, for a quick ascendancy for the euro as an international currency, just as most observers predict (e.g., Bergsten 1997; Hartmann 1998; Portes and Rey 1998). It should not take long for the new currency to surpass the present aggregate share of the DM and other EMU currencies in foreign trade and investment. The only question is how high the euro will rise and



how much business it will take from the dollar.

As with the yen, the answer rests first and foremost on prospective developments in financial markets. Even with the euro's promise of broad economies of scale and stable purchasing power, the greenback will be favored by the natural advantages of incumbency unless euro transaction costs, which are currently higher than those on the more widely traded dollar, can be lowered to more competitive levels. The level of euro transaction costs, in turn, will depend directly on what happens to the structure of Europe's financial markets as the merger of Euroland currencies proceeds. Without substantial improvements in market efficiency and openness, it will be difficult for the euro to overcome the forces of inertia characteristic of international currency use. Portes and Rey put the point most succinctly: "The key determinant of the extent and speed of internationalization of the euro will be transaction costs in foreign exchange and securities markets" (Portes and Rey 1998: 308).

There is little reason to doubt that EMU will indeed improve the structural efficiency of Europe's financial system. Introduction of the euro will eventually create the largest single-currency financial market in the world. The aggregate value of Euroland financial claims (bonds, equities, and bank loans) is already almost as large as that of the United States and is likely to continue growing in the future. Beyond that, there are bound to be major qualitative improvements in market depth and liquidity as previously segmented national markets are gradually knitted together into one integrated whole. The elimination of exchange risk inside EMU will intensify competition between financial institutions, particularly in such hotly contested activities as bond underwriting and syndicated bank lending, thus encouraging cost-cutting and innovation. Likewise, the harmonization of laws and conventions and the development of new cross-border payments systems will enhance the marketability of assets of all kinds. Progress is expected to be swiftest in the markets for securities and bank loans but slower in the area of equities, where structural barriers between Europe's relatively small national markets have traditionally been greatest (McCauley and White 1997; Dermine and Hillion 1999).

There is also little reason to doubt that these improvements will have a substantial impact on international investment and commercial practice. More offshore borrowing is likely to be done in euros, for instance, as compared with amounts raised in DM or other EMU currencies in the past. Bond sales and bank loans will be facilitated by lower transactions costs and the ability to tap broader pools of savings. Foreign equity issues too will probably increase once European stock markets are successfully upgraded and consolidated. Likewise more offshore savings are apt to be placed in euros, again as compared with investments in EMU currencies in the past, attracted by the new depth and liquidity on offer. Knowledgeable sources have estimated that foreign demand for euro-denominated assets could rise by anywhere from \$400 billion to \$800 billion (Bergsten 1997:30; McCauley and White 1997:358). Use of the euro as a vehicle currency in exchange markets should also rise. And given Euroland's importance in international trade,

particularly in East-Central Europe, the Balkans, and the Mediterranean basin, an increase in the euro's share of export invoicing as compared with the pre-EMU share of the DM and other Euroland currencies should be anticipated as well (Hartmann 1998: 97-114).

Yet the question remains: Will these improvements lower euro transaction costs enough to overcome the powerful conservative bias inherent in the dynamics of the marketplace? About that, legitimate doubts remain. Certainly much of the increase of business in euros will come at the expense of the dollar, reducing the greenback's present margin of leadership. But it seems equally certain that anticipated efficiency gains in Europe's financial markets, though substantial, are unlikely on their own to suffice to displace the dollar from top rank. Spontaneous market developments will have to be reinforced by deliberate policy actions for the crown to pass securely to the euro. Again Portes and Rey put the point most succinctly: "If they wish to promote the emergence of the euro as an international currency, European authorities must make the domestic euro financial markets more efficient, more integrated and cheaper for participants" (Portes and Rey 1998: 310).

In short, the logic of market competition tells us that in all likelihood the only serious challenge to the dollar in coming years will be from the euro — not from the yen and, most certainly, not from any other existing national currency— but even for the euro, success will be determined not just by market developments but also by official policy actions. This brings us to the subject of the strategic preferences of governments.

### 3. GOVERNMENT PREFERENCES

No discussion of currency relations can ignore government preferences. States have long placed a high value on control of the issue and management of money — what is commonly referred to as national monetary sovereignty. We know, of course, that in a number of countries private monies exist, sometimes in fairly sizable numbers (Solomon 1996). But we also know that all such monies remain deliberately local, circulating on a very restricted scale. The currencies that really matter in today's world are state currencies: the progeny of independent national governments (or several governments acting collectively in a monetary union). Currency outcomes, as a consequence, are inherently political, not just economic. The future of national currencies, including the Big Three, will depend not only on the logic of market competition but also on the nature of state behavior.

#### 3.1. From monopoly to oligopoly

National policy choices were relatively simple when money was largely territorial. Currency domains could be assumed to coincide precisely with the political frontiers of states. Governments could legitimately aspire to exercise a

monopoly control over the issue and management of money.

It is easy to see why a monetary monopoly might be highly prized by governments. Genuine power resides in the command that money represents. Four main benefits are derived from a strictly territorial currency: first, a potent political symbol to promote a sense of national identity; second, a potentially powerful source of revenue, seigniorage (otherwise known as the “inflation tax”), to underwrite public expenditures; third, a possible instrument to manage the macroeconomic performance of the economy; and finally, a practical means to insulate the nation from foreign influence or constraint. Absolute monetary sovereignty clearly privileges the interests of government in relation to societal actors – a privilege that over time has been wisely used by some and badly abused by many others.

A map of neatly divided territorial currencies is still the geography that most people think of, insofar as they think about currency space at all. It is also the geography that most people think has prevailed for all time, as if monetary relations could never be configured in any other way. In fact, nothing is further from the truth. Monetary geography is not written in stone, and territorial currencies are actually, in historical terms, of quite recent origin. Prior to the 1800s, no government even thought to claim a formal monopoly over the issue and use of money within its political domain. Cross-border circulation of currencies was not only accepted but widespread and commonplace. The notion of absolute monetary sovereignty really began to emerge only in the nineteenth century, with the formal consolidation of the powers of nation-states in Europe and elsewhere, and reached its apogee only in the middle of the twentieth century. Since then, as I argued in *The Geography of Money*, the tide has clearly reversed – all part of the broadening globalization of the world economy that has been going on since World War II. Driven by the pressures of competition and technological innovation, national financial and monetary systems have become increasingly integrated, effectively widening the array of currency choice for many transactors and investors. As a result, strictly territorial currencies are fast disappearing in most parts of the world. Today, as we enter the twenty-first century, money is becoming increasingly deterritorialized.

Currency deterritorialization poses a new and critical challenge to policymakers. No longer able to exert the same degree of control over the circulation of their monies, governments are driven to compete, inside and across borders, for the allegiance of market actors — in effect, to a fight for market share, not unlike rival firms in an oligopolistic industry. Their targets are the users of money, at home or abroad. Their aim is to sustain or enhance a currency’s authoritative domain, almost as if monies were like goods to be sold under registered trademarks. As economist Robert Aliber has quipped, “the dollar and Coca-Cola are both brand names.... Each national central bank produces its own brand of money... Each national money is a differentiated product... Each central bank has a marketing strategy to strengthen the demand for its particular brand of money” (Aliber 1987: 153). Monopoly, in short, has yielded to something more like oligopoly, and monetary governance is rapidly being reduced to little more than a choice among marketing strategies designed to shape and manage demand. The management of

money, at its most basic, has become a political contest for market loyalty.

Furthermore, all states must be considered part of the oligopolistic struggle, no matter how competitive or uncompetitive their respective currencies may be. Rivalry is not limited merely to the trio of monies at the peak of the Currency Pyramid, as is sometimes suggested (De Boissieu 1988). That would be so only if cross-border competition were restricted to international use alone: the Big Three currencies, along with a few minor rivals (e.g., sterling and the Swiss franc), vying for shares of private investment portfolios or for use in trade invoicing. Deterritorialization, however, extends to foreign-domestic use as well — CS as well as CI — hence involving all national currencies, to some degree, in direct competition with one another, the weak as well as the strong. Money's oligopoly is truly global.

The question is: In this new oligopolistic setting, driven by the logic of market competition, how can governments be expected to respond to emerging rivalries at the peak of the Currency Pyramid? Outcomes will be determined jointly by two sets of state actors — those at the peak of the Pyramid (the United States, Euroland, and Japan) and those below. Each group will be examined in turn.

### 3.2. Leadership rivalries

At the peak of the Currency Pyramid anticipated shifts in relative standing among the Big Three currencies will almost certainly trigger enhanced policy competition across both the Atlantic and the Pacific. The reason is simple. Much is at stake. The benefits of market leadership will not be conceded without a struggle.

Though minimized by some (e.g., Wyplosz 1999: 97-100), the benefits of market leadership can in fact be considerable. Most discussion tends to focus primarily on seigniorage: the implicit transfer, equivalent to a subsidized or interest-free loan, that goes to a country when its money is widely used and held abroad. Seigniorage income, on its own, is unlikely to be large enough to spark major policy conflict. But this ignores two other gains that, while less easily quantified, are apt to be much more important. One is the increased flexibility of macroeconomic policy that is afforded by the privilege of being able to rely on domestic currency to help finance external deficits. The other is the political power that derives from the monetary dependence of others. Not only is the issuing country better insulated from outside influence or coercion in the domestic policy arena. It is also better positioned to pursue foreign objectives without constraint or even to exercise a degree of influence or coercion internationally. In conjunction with seigniorage, these are advantages surely worth battling for, as numerous sources acknowledge (e.g., Portes and Rey 1998: 308-310). Enhanced policy competition among the Big Three should come as no surprise.

Indeed, there is evidence that the battle has already begun. Consider, for example, the controversial decision of the new European Central Bank to plan issues of euro notes in denominations as high as 100, 200, and 500 euros — sums far greater than most Eurolanders are likely to find useful for everyday transactions

when euro bills and coins begin to circulate in 2002. Why do it? Informed sources suggest that the plan may have been decided in order to reassure the German public, fearful of losing their beloved Deutschmark, that notes comparable to existing high-denomination DM bills would be readily available. But that is hardly the whole story. As knowledgeable experts like Kenneth Rogoff (1998) and Charles Wyplosz (1999) observe, it is also likely that the decision had something to do with the familiar phenomenon of dollarization: the already widespread circulation of large-denomination dollar notes in various parts of the world, especially of the \$100 variety. Dollarization translates conservatively into an interest saving for the U.S. Government, a form of seigniorage earnings, of at least \$15 billion a year (Blinder 1996) — not a huge profit but nonetheless enough, apparently, to persuade EMU's authorities to plan on offering a potentially attractive alternative. As Rogoff has written: "Given the apparently overwhelming preference of foreign and underground users for large-denomination bills, the [ECB's] decision to issue large notes constitutes an aggressive step toward grabbing a large share of developing country demand for safe foreign currencies" (1998: 264).

In turn, there is every reason to believe that Washington will be provoked to respond in kind. Already a proposal to offer a \$500 note to rival the ECB's large-denomination bills has been circulated in the U.S. Congress (Makinen 1998: 5). Legislation has even been introduced to encourage developing countries to adopt the dollar formally as a replacement for their own national currencies — *official* dollarization, as the idea has come to be known. As an incentive Washington would offer a specified share of the resulting increase in U.S. seigniorage earnings. Policy support for official dollarization is being actively promoted by the Joint Economic Committee of the Congress (1999).

More generally, given the considerable benefits of market leadership, there seems every reason to expect Euroland and the U.S. to compete vigorously to sustain or promote demand for their respective currencies. Europeans clearly desire to see the euro established on a par with the dollar as an international currency. If spontaneous market developments appear unlikely to achieve this goal on their own, as I suggest, additional policy actions will undoubtedly follow. What more can the Europeans do? Apart from issuing high-denomination notes, cross-border use of the euro might be encouraged by, for example, subsidizing the development of debt markets in the new currency or by underwriting the euro's use as a vehicle for currency trading or third-country trade. In so doing, however, Euroland will also put itself on track for open confrontation with the United States. Aggressive policy initiatives from one side of the Atlantic will almost certainly provoke more retaliatory countermeasures from the other side, along lines already being mooted in Washington. Competition is likely to be intense and possibly nasty.

The same can be expected across the Pacific as well, where Japan has given every indication that it too intends to stay in the fray, actively battling to preserve as much as possible of the yen's presently fragile international role — in Tokyo's own hinterland in East Asia at least, if not beyond. One straw in the wind came in 1996, when Japan signed a series of agreements with nine neighboring countries

to lend their central banks yen if needed to help stabilize exchange rates. Informed sources had no doubt that these pacts were deliberately designed to increase Japanese influence among members of an eventual yen bloc. “It’s a manifest attempt to take leadership,” said one bank economist in Tokyo (*New York Times*, April 27, 1996: 20). And an even stronger indicator came in 1997, after the first shockwaves of the Asian financial crisis, when Tokyo seized upon the occasion to propose a new regional financial facility — what quickly came to be called the Asian Monetary Fund (AMF) — to help protect local currencies against speculative attack. The AMF proposal was by far the most ambitious effort yet by Japan to implement a strategy of market leadership in Asian finance. Although successfully blocked by the United States, which publicly expressed concern about a possible threat to the central role of the International Monetary Fund (where U.S. influence is paramount), the idea continues to attract favorable interest (Bergsten 1998).

Moreover, despite economic troubles at home and the steady repatriation of private investments from abroad, Tokyo has persisted in seeking new ways to promote its monetary role in the region. In October 1998, Finance Minister Kiichi Miyazawa offered some \$30 billion in fresh financial aid for Asia in a plan soon labeled the “New Miyazawa Initiative”; and two months later made clear that Japan had every intention to revive its AMF proposal when the time seemed right (*Financial Times*, December 16, 1998). Similarly, in late 1999, Japanese authorities floated a plan to drop two zeros from the yen (which is currently valued at over one hundred yen for either the dollar or the euro) in order to facilitate its use in foreign transactions. Simplifying the currency’s denomination, said one official, “might have a positive effect in that the yen would be more internationally easy to understand” (*New York Times*, November 19, 1999: C4). Commented a foreign banker in Tokyo: “If there’s a liquid market in dollars and a liquid market in euros, there’s a risk of Japan becoming a sort of second-string market.... They don’t want the yen to become the Swiss franc of Asia” (*New York Times*, November 19, 1999: C4). Clearly, Tokyo does not intend to allow further erosion of the yen’s standing without a fight.

But here too, as in Europe, aggressive policy initiatives will almost certainly put the Japanese on track for confrontation with the United States. Even a yen-bloc enthusiast like economist David Hale acknowledges that “there is also a risk that [such measures] will be interpreted as a threat by some Americans [and] could intensify the economic conflicts that are already straining U.S.-Japan relations” (Hale 1995: 162). Yen competition with the dollar is likely to be no less heated than the expected greenback-euro rivalry, and could be even nastier. Market leadership will continue to be the strategic preference of all the Big Three currencies.

### 3.3. Follower options

But will others follow? For countries lower down in the Currency Pyramid, fallout from intensified rivalry among the Big Three will be unavoidable. Governments across the globe will be compelled to reconsider their own strategic

preferences. Outcomes, however, are likely to be far less uniform than many predict.

Most common is the prediction that out of growing currency deterritorialization and heightened competition for market leadership will soon emerge two or three large monetary blocs centered on the dollar, euro, and, possibly, the yen (Eichengreen 1994; Beddoes 1999; Hausmann 1999). Governments will seek to shelter themselves from possible currency turmoil by subordinating their monetary sovereignty to one of the top international currencies via a firm exchange-rate rule — in effect, a strategy of market “followership” (analogous to passive price followership in an oligopoly). Linkage could take the form of a tight single-currency peg or, more radically, could be implemented by means of an ostensibly irrevocable currency board or even official dollarization (“euronization?” “yenization?”).

Market followership would naturally be attractive to countries with particularly close economic or political ties to one of the dominant financial powers — like many of the states of Latin America, ever in the shadow of the United States; or many of the economies of the former Soviet bloc, the Mediterranean basin, or sub-Saharan Africa, with their close ties to Europe. The dollar already serves as nominal anchor for a number of smaller countries in the Caribbean and Pacific, as well as in scattered locations elsewhere; the euro does the same for several currency boards in East-Central Europe as well as the CFA Franc Zone, having seamlessly taken over the role in francophone Africa previously played by the French franc. Economists Patrick Honohan and Philip Lane (1999) suggest that more African currencies will soon be tied to the euro. Other sources confidently predict that pegs to the euro will soon be adopted by many Mediterranean countries as well (Bénassy-Quéré and Lahrière-Révil 1999). In turn, the debate has been reopened in Latin America over the possible merits of closer ties to the greenback (Dornbusch 1999; Hausmann *et al.* 1999).

In the past, such ideas might have been dismissed as politically naive. All kinds of problems could be cited, from the loss of a lender of last resort under a currency board to the loss of seigniorage with dollarization. But that was before Argentina which, despite a well known history of the most intense nationalism, successfully opted for a dollar-based currency board in 1991 — and whose former president, before leaving office late last year, even proposed replacing Argentina’s peso altogether with the greenback. In the context of the coming rivalry among the Big Three, the Argentine case is now considered instructive. A strategy of irrevocable market followership no longer seems a fantasy. As Rudi Dornbusch puts the point, with characteristic flair: “The lesson is obvious: Europe’s periphery should adopt the Euro on a currency board basis or fully. And in the same spirit, Latin America should follow the Argentine example of a currency board on the US dollar or outright dollarization” (Dornbusch 1999: 8). In January 2000 Ecuador became the first to follow Dornbusch’s advice, announcing plans to replace its national currency with the dollar; and several other Latin American governments were reported to be considering initiatives along the same lines.

But what of countries that might prefer *not* to be dominated, whether by the U.S. or Europe (or Japan)? Not all governments can be expected to acquiesce willingly in a passive strategy of market followership. Other options exist, from free floating to various contingent exchange-rate rules, such as a loose single-currency peg or basket peg, a crawling peg, or target zones of one kind or another. There is every reason to believe that governmental preferences are likely to be correspondingly diverse.

Opinions differ on whether the full range of these options is actually available in practice. According to some observers, neither free floating nor irrevocably fixed rates can be regarded as truly viable options. Fixed rates, we are told, are too rigid, risking prolonged misalignments and payments disequilibria, while flexible rates are too volatile and prone to speculative pressures. The only real choices are intermediate regimes that promise a degree of adaptability without generating undue uncertainty – in other words “stable but adjustable rates,” to borrow a phrase from an earlier era. Quite the contrary, retort others, who insist that in fact it is the intermediate choices that are discredited, not the extreme “corner solutions,” owing to the great increase of international capital mobility in recent decades. The middle ground of contingent rules has in effect been “hollowed out,” as Barry Eichengreen (1994) memorably put it.

In reality, however, neither corner solutions nor contingent rules are discredited, for the simple reason that in an imperfect world there is no perfect choice. All such views rest on implicit—and questionable—political judgments about what tradeoffs may or may not be tolerable to policymakers. Eichengreen’s hollowing-out hypothesis, for example, clearly assumes that governments will be unwilling to pay the price of coping with occasional speculative crises. Defenders of contingent rules, conversely, assume that governments will naturally prefer to avoid absolute commitments of any kind—whether to an irrevocable exchange rate or to market determination of currency values—whatever the cost. The reality, as Jeffrey Frankel (1999) has persuasively argued, is that such tradeoffs are made all the time when exchange-rate regimes are decided. No option is ruled out *a priori*.

The political dimension of exchange-rate choice tends to be discounted in conventional economic models, where policymakers are assumed to be concerned more or less exclusively with maximizing output and minimizing inflation in the context of an open economy subject to potentially adverse shocks. In fact, political factors enter in two ways. First, the calculus is obviously affected by domestic politics: the tug and pull of organized interest groups of every kind. The critical issue is the familiar one of whose ox is gored. Who wins and who loses? The material interests of specific constituencies are systematically influenced by what a government decides to do with its money. Policy design and implementation are bound to be sensitive to the interplay among domestic political forces.

Second, the utility function of policymakers obviously includes more than just macroeconomic performance. As a practical matter, sovereign governments worry about other things too—not least, about their own policy autonomy: their scope for discretion to pursue diverse objectives in the event of unforeseen



developments, up to and including war. Key here is the domestic seigniorage privilege — what one source calls a state’s “revenue of last resort” (Goodhart 1995: 452). The more tightly a currency is pegged, the less room policymakers have to resort at will to inflationary money creation to augment public spending when deemed necessary. Monetary firmness is gained, but at a loss of fiscal flexibility. Certainly it is not wrong to attach importance to a reduction of exchange-rate uncertainty, which can promote trade and investment and squeeze out risk premia in interest rates. But in an insecure world, governments may be forgiven for attaching importance to currency flexibility too, as a defense against *political* uncertainty. Policy design and implementation are bound to be sensitive to the interplay among such considerations as well.

For all these reasons, therefore, strategic preferences are bound to vary considerably depending on the unique circumstances of individual countries. While followership may be attractive to some, a more neutral stance will be attractive to states with more diversified external relations, political as well as economic — notably, states like those in Japan’s neighborhood in East Asia, which trade as much with the United States, and nearly as much with Europe, as they do with the Japanese; and which prefer to maintain equally cordial ties with all three centers of the industrial world. Indeed, such countries are actually well placed to take advantage of the coming competition among the Big Three to play off one reserve center against another, bargaining for the best possible terms on new debt issues or for a formal share of international seigniorage revenues.

Neutrality in exchange-regime choice can take the form of a floating rate, the current policy in a sizable number of countries; or it could be implemented as a basket peg, with appropriate weights assigned to each of the Big Three currencies as well as possibly others. Floating offers the obvious advantage of adaptability to changing circumstances. Stung by the financial crisis that erupted in 1997, which most analysts attribute at least in part to the dollar-dominated pegs that Asian governments had tried vainly to defend against unrelenting speculation, many states today are attracted by the alternative of no peg at all — a kind of default strategy that relieves them of any formal obligation to intervene in currency markets. But floating is hardly an all-purpose panacea either, as informed observers are now beginning to acknowledge (Cooper 1999; Hausmann 1999). In countries where financial markets are still much thinner than in the advanced industrial nations, even small movements into or out of a currency can spell massive exchange-rate volatility. Not all governments may be prepared to live forever with persistent and often arbitrary currency swings. For many, an appropriately weighted basket might not look so bad after all. Basket pegging, preserving a degree of currency neutrality as well as stability, has been widely advocated in particular for the Asia-Pacific region as an alternative to floating (e.g., Williamson 1999).

There is also another option. That is monetary union — in effect, a strategy of market “alliance” (analogous to a tacit or explicit cartel in an oligopoly). On the model of EMU local currencies could be merged into one regional money, subordinate to none of the Big Three. The possibility of monetary union in Asia

or Latin America, though ardently advocated by some (e.g., Walter 1998), has been dismissed by others as impractical on economic grounds (e.g., Eichengreen and Bayoumi 1999; Hausmann *et al.* 1999). Neither Asians nor Latin Americans, we are told, come even close to approximating an optimum currency area (OCA). Until more of the criteria of OCA theory are satisfied, governments are unlikely to take the plunge. Such arguments, however, once again discount the political dimension, which in the history of monetary unions is central (Cohen 1998: ch. 4). In fact, among all cases of currency unification in the last two centuries, it is impossible to find a single example that was motivated exclusively, or even predominantly, by the concerns highlighted in OCA theory. Political objectives have always predominated. Today, one relevant political objective could well be to emulate EMU. Assuming Europe's monetary experiment is seen as a success, the most powerful impact of the euro could, ironically, turn out to be a demonstration effect, encouraging consideration of similar initiatives elsewhere. Economics notwithstanding, the plausibility of the market-alliance option thus should not be underestimated.

In short, below the peak of the Currency Pyramid outcomes will defy easy generalization. While some states no doubt will be attracted by the security of a followership strategy, sheltering under the wing of one of the Big Three, many others are more likely to prefer to preserve for themselves some room for maneuver in the event of unanticipated circumstances – some more palatable compromise between a government's desire to reduce exchange-rate uncertainty and its legitimate determination to guard against political uncertainty. Many national monies will continue to fight for their own market share, even while others may join together in regional unions or in broader monetary blocs. The geography of money in coming decades will be anything but simple.

#### 4. TECHNOLOGICAL DEVELOPMENTS

Finally, we have to take into consideration one last factor, prospective technological developments, which over the longer term could add even more complexity to tomorrow's monetary landscape. Today's world, I have noted, is still dominated by state currencies. But that will not be so forever. Assuming present technological trends persist, it is only a matter of time before various innovative forms of money based on digital data – collectively known as *electronic money* – begin to substitute in one way or another for bank notes and checking accounts as customary means of payment. A century from now electronic money could be in widespread circulation, commanding the same general acceptability presently enjoyed by conventional currencies. Once that happens, the geography of money will be even more fundamentally transformed, with currency domains then defined exclusively in the virtual landscapes of cyberspace. Governments will be obliged to compete not only with one another but also with an increasingly diverse range of *private* issuers of money. Implications for life at the top of the Currency Pyramid

will be truly profound.

#### 4.1. From deterritorialization to denationalization

The issue may be simply stated. Even with currency deterritorialization, states today still dominate the supply side of the market, retaining jurisdiction over the issue of the monies that most people continue to use. Governments may no longer be able to enforce an *exclusive* role for their own currency within established political frontiers; in other words, they may no longer be able to exercise the monopoly control they once claimed over demand. But as the main source of the supply of money they are still in a favored position, like oligopolists, to *influence* demand insofar as they can successfully compete inside and across borders for the allegiance of market agents. Some measure of power is thus retained to the extent that user preferences can be swayed.

Even that limited measure of power, however, can be retained only so long as states collectively remain dominant on the supply side of the market. Significantly, voices have long been heard opposing even that much government “interference,” preferring instead to leave money creation solely in the hands of private financial institutions in a world of truly unrestricted currency competition. Envisioned is a system of effectively deterritorialized money shaped exclusively by market forces — *denationalized* money as the idea was called by its best known advocate, the Austrian Friedrich Hayek (1990). However, although Hayek’s influential laissez-faire views have been echoed by other economists in both Europe and the United States, they have failed as yet to enter the mainstream of professional thinking on monetary management. While a variety of denationalized currencies do in fact already exist, both domestically and internationally, to rival the official issue of central banks, none has as yet had an impact on state dominance of the supply side that might be described as anything more than marginal.

At the domestic level, as already observed, diverse private monies circulate in a number of countries. But such currencies really are little different from institutionalized systems of multilateral barter, and none trade across national frontiers. At the international level, private substitutes for state monies have long existed in the form of what economists call “artificial currency units” (ACUs) — non-state alternatives designed to perform one or more of the conventional roles of money. Traditionally, though, most ACUs have functioned mainly as a unit of account or store of value, rather than as a medium of exchange, thus posing little direct threat to government dominance of supply. In recent years the only non-state form of money that has been used to any substantial degree internationally is a pool of privately issued assets denominated in ECUs, the European Union’s old European Currency Unit that came into existence with the European Monetary System in 1979 (now replaced by EMU). Despite having attained limited success in global financial markets, however, the ECU was never widely accepted for private

transactional purposes.

#### 4.2. Electronic money

But now consider electronic money, a technological breakthrough that many specialists regard as only a matter of time given the rapid growth of commerce across the Internet and World Wide Web. Around the globe, entrepreneurs and institutions are racing to develop effective means of payment for the expanding realm of cyberspace. The aim is to create units of purchasing power that are fully usable and transferable electronically: virtual money that can be employed as easily as conventional money to acquire real goods and services. If and when some of these experiments succeed, governments will face a competitive challenge unlike any they have experienced in living memory—full-bodied ACUs beyond their individual or even collective control; in short, genuinely denationalized media to rival existing national monies. Then dominance of the supply side, not just demand, really will be lost. Hayek's vision of a world of unrestricted currency competition will—like it or not—be effectively realized, and the much anticipated rivalry of the Big Three could turn out to be little more than a sideshow.

Electronic money (also variously labeled digital currency, computer money, or e-cash) comes in two basic forms, *smart cards* and *network money*. Both are based on encrypted strings of digits—information coded into series of zeros and ones—that can be transmitted and processed electronically. Smart cards, a technological descendant of the ubiquitous credit card, have an embedded microprocessor (a chip) that is loaded with a monetary value. Versions of the smart card (or “electronic purse”) range from simple debit cards, which are typically usable only for a single purpose and may require online authorization for value transfer, to more sophisticated stored-value devices that are reloadable, can be used for multiple purposes, and are off-line capable. Network money stores value in computer hard drives and consists of diverse software products that allow the transfer of purchasing power across electronic networks.

Both forms of electronic money are still in their infancy. Being based largely on full prepayment by users, each to date has functioned as not much more than a convenient proxy for conventional money—in effect, something akin to a glorified travelers check. The velocity of circulation has been affected but not money supply per se. Both, however, have the capacity to grow into something far more challenging to state authority, given sufficient time and ingenuity. The key is to find attractive and, more importantly, credible ways to offer smart cards or network money on credit, denominated in newly coined “digital value units,” in the same way that commercial banks have long created money by making loans denominated in state-sanctioned units of account. As general liabilities of their issuers these new ACUs could then circulate freely from user to user, without debiting or crediting third-party accounts, and thus substitute fully for existing national monies. That is where the real threat of denationalization lies.

The threat is not immediate, of course. The passage from deterritorialization to denationalization will not happen overnight. Quite the contrary, the process is apt to be quite slow and could take most of the next century to be completed. To begin, a number of tricky technical issues will have to be addressed, including *inter alia* adequate provisions for security (protection against theft or fraud), anonymity (assurance of privacy), and portability (independence of physical location). None of these challenges is apt to be resolved swiftly or painlessly.

Even more critical is the issue of *trust*: how to command confidence in any new brand of money given the inertias that generally typify currency use. The conservative bias of the marketplace is a serious obstacle – but not an insuperable one. Quite the contrary, in fact. As the volume of electronic commerce grows, it seems almost inevitable that so too will brand-name recognition and trust. Another lesson we learn from monetary history is that even if adoption begins slowly, once a critical mass is attained widespread acceptance will indeed follow. Certainly there is adequate incentive for enterprises and institutions – nonbanks as well as banks – to try to promote new monetary trademarks wherever and whenever they can. The stimulus lies in the promise of seigniorage: the alluring profit that can be gained from the difference between the cost of creating money and the value of what money can buy. The success of any new brand of currency will depend first and foremost on the inventiveness of its originators in designing features to encourage use. These “bells and whistles” might include favorable rates of exchange when amounts of electronic money are initially acquired; attractive rates of interest on unused balances; assured access to a broad network of other transactors and purveyors; and discounts or bonuses when the electronic money rather than more traditional currency is used for purchases or investments. Sooner or later, at least some of these efforts to whet user appetite are bound to achieve success.

Most critical of all is the question of value: how to safely preserve the purchasing power of electronic money balances over time. Initially at least, this is likely to require a promise of full and unrestricted convertibility into more conventional legal tender – just as early paper monies first gained wide acceptance by a promise of convertibility into precious metal. But just as paper monies eventually took on a life of their own, delinked from a specie base, so too might electronic money one day be able to dispense with all such formal guarantees as a result of growing use and familiarity. That day will not come soon, but it does seem the most plausible scenario of the more distant future given present trends. As *The Economist* has written, over the long term “it is possible to imagine the development of e-cash reaching [a] final evolutionary stage... in which convertibility into legal tender ceases to be a condition for electronic money; and electronic money will thereby become indistinguishable from — because it will be the same as — other, more traditional sorts of money” (*The Economist* 1994: 23). When that day finally dawns, perhaps one or two generations from now, we could find a monetary

landscape literally teeming with currencies in competition for the allegiance of transactors and investors. In the words of banker Walter Wriston:

*"The Information Standard has replaced the gold-exchange standard.... As in ancient times, anyone can announce the issuance of his or her brand of private cash and then try to convince people that it has value. There is no lack of entrants to operate these new private mints ranging from Microsoft to Mondex, and more enter every day" (Wriston 1998: 340).*

How many currencies might eventually emerge? Almost certainly it will not be the "thousand of forms of currency" predicted by anthropologist Jack Weatherford, who suggests that "in the future, everyone will be issuing currency – banks, corporations, credit card companies, finance, companies, local communities, computer companies, Net browsers, and even individuals. We might have Warren Buffet or William Gates money" (Weatherford 1998: 100). Colorful though Weatherford's prediction may be, it neglects the powerful force of network externalities in monetary use, which dictates a preference for fewer rather than more monies in circulation. No doubt there will be much market experimentation, and thousands of forms of e-currency might indeed be tried. But after an inevitable sorting-out process, the number of monies that actually succeed in gaining some degree of general acceptability is sure to be reduced dramatically. Many currencies, unable to compete effectively, will simply disappear

But neither is it likely that the number of monies will be reduced to as few as one, as the German economist Roland Vaubel has contended, exclusively stressing the power of economies of scale. In his words: "Ultimately, currency competition destroys itself because the use of money is subject to very sizable economies of scale.... The only lasting result will be ... the survival of the fittest currency" (1977: 437, 440). In fact, economies of scale are not the only consideration that matters, as modern network theory teaches. Of equal importance are considerations of stability and credibility, which suggest that the optimal number of monies in a world of unrestrained currency competition will actually be significantly greater than one (Thygesen *et al.* 1995: 39-45).

In network theory, two distinct structures are recognized in the configuration of spatial relations: the "infrastructure," which is the functional basis of a network; and the "infostructure," which provides needed management and control services. Economies of scale, by reducing transactions costs, obviously promote a consolidation of networks at the level of infrastructure, just as Vaubel argues. But at the infostructure level, by contrast, the optimal configuration tends to be rather more decentralized and competitive, in order to maximize agent responsibility. Some finite number of rival networks will counter the negative effects of absolute monopoly, which frequently leads to weakened control by users and diluted incentives for suppliers. Hence a rational trade-off exists for market agents, an impulse for some degree of diversification that is most likely to result in an

equilibrium outcome short of complete centralization. In the monetary geography of the future, a smallish population of currencies is far more probable than a single universal money.

Where does that leave today's Big Three? Clearly, even a smallish population of currencies will continue to display characteristics of hierarchy, reflecting varying degrees of competitive strength. The currencies that disappear, including newer e-monies as well as older national currencies, will be those that cannot survive the harsh Darwinian process of natural selection. There is no reason to believe the dollar, euro, and yen will be unable to compete effectively even far into the next century.

But there is also no reason to believe that in that more distant future the Big Three will continue to monopolize the peak of the Currency Pyramid, as they do at present. There may be no serious challengers to their dominance among currencies in circulation today, which are all state currencies. But there could well be serious challengers to be found among the electronic monies of tomorrow, which will be largely private. Microsoft money could in time become more popular than greenbacks. As the deputy governor of the Bank of England has suggested, "the successors to Bill Gates [could] put the successors to Alan Greenspan out of business" (*New York Times*, December 20, 1999: C3). By the end of the twenty-first century, life at the top might look very different indeed.

## 5. CONCLUSION

The conclusions of this discussion can be summarized briefly. Prospects for the top international currencies differ considerably depending on the time horizon in question. In the near term, the position of the Big Three at the peak of the Currency Pyramid looks secure, with no immediate challenger in sight. Relative standings could shift substantially, however, with the euro gaining on the dollar in market competition and the yen possibly fading to an even more distant third place. As a result policy rivalry among the reserve centers will almost certainly intensify, in turn compelling governments elsewhere to reconsider their own strategic preferences. Some countries will undoubtedly opt to tie their currencies closely to one of the Big Three, promoting the coalescence of two or possibly three large monetary blocs. But many others will choose to remain more neutral, and some may well be tempted by the precedent of EMU to try merging their currencies into regional monetary unions in order to sustain or promote user loyalty.

Beyond the near term, by contrast, the position of the Big Three looks less secure, not because of a rising challenge from any existing national currency but rather because of the impending development of future private monies in the virtual world of cyberspace. The twenty-first century will introduce the era of electronic monies – monies that are not only deterritorialized but denationalized as well. Some of these new monies could eventually hold more market appeal than any of today's top international currencies.

## REFERENCES

- Aliber, Robert Z. (1987), *The International Money Game*, fifth edition (New York: Basic Books).
- Bank for International Settlements (1999), *Central Bank Survey of Foreign Exchange and Derivatives Market Activity 1998* (Basle: Switzerland).
- Beddoes, Zanny Minton (1999), "From EMU to AMU? The Case for Regional Currencies," *Foreign Affairs* 78:4 (July/August), 8-13.
- Bénassy-Quéré, Agnès and Amina Lahrèche-Révil (1999), "The Euro and Southern Mediterranean Countries" (Paris: CEPII, unpublished).
- Bergsten, C. Fred (1997), "The Impact of the Euro on Exchange Rates and International Policy Cooperation," in Paul R. Masson, Thomas H. Krueger, and Bart G. Turtelboom, eds., *EMU and the International Monetary System* (Washington: International Monetary Fund), ch. 2.
- Bergsten, C. Fred (1998), "Missed Opportunity," *The International Economy* 12:6 (November / December), 26-27.
- Blinder, Alan S. (1996), "The Role of the Dollar as an International Currency," *Eastern Economic Journal* 22:2 (Spring), 127-136.
- Bundesbank (1995), "The Circulation of Deutsche Mark Abroad," *Monthly Report* 47: 7 (July), 65-71.
- Cohen, Benjamin J. (1971), *The Future of Sterling as an International Currency* (London: Macmillan).
- Cohen, Benjamin J. (1998), *The Geography of Money* (Ithaca, NY: Cornell University Press).
- Cooper, Richard N. (1999), "Should Capital Controls be Banished?," *Brookings Papers on Economic Activity* 1, 89-141.
- De Boissieu, Christian (1988), "Concurrence entre monnaies et polycentrisme monétaire," in D. E. Fair and Christian De Boissieu, eds., *International Monetary and Financial Integration – The European Dimension* (Boston: Kluwer Academic), ch. 13.
- Dermine, Jean and Pierre Hillion, eds. (1999), *European Capital Markets with a Single Currency* (Oxford: Oxford University Press).
- Dornbusch, Rudi (1999), "The Euro: Implications for Latin America" (Washington: World Bank, unpublished).
- Dowd, Kevin and David Greenaway (1993), "Currency Competition, Network Externalities and Switching Costs: Towards an Alternative View of Optimum Currency Areas," *Economic Journal* 103 (September), 1180-1189.
- The Economist* (1994), "Electronic Money: So Much for the Cashless Society," November 26, 21-23.
- Eichengreen, Barry (1994), *International Monetary Arrangements for the 21<sup>st</sup> Century* (Washington: Brookings Institution).
- Eichengreen, Barry and Tamim Bayoumi (1999), "Is Asia an Optimum Currency Area? Can It Become One? Regional, Global, and Historical Perspectives on Asian Monetary Relations," in Stefan Collignon, Jean Pisani-Ferry, and Yung Chul Park, eds., *Exchange Rate Policies in Emerging Asian Countries* (London: Routledge), ch. 21.
- Frankel, Jeffrey A. (1999), *No Single Currency Regime is Right for All Countries at All Times*, Essay in International Finance 215 (Princeton, NJ: International Finance Section).



- Goodhart, Charles A.E. (1995), "The Political Economy of Monetary Union," in Peter B. Kenen, ed., *Understanding Interdependence: The Macroeconomics of the Open Economy* (Princeton: Princeton University Press), ch. 12.
- Hausmann, Ricardo (1999), "Should There Be Five Currencies or One Hundred and Five?," *Foreign Policy* 116 (Fall), 65-79.
- Hausmann, Ricardo, Michael Gavin, Carmen Pages-Serra, and Ernesto Stein (1999), "Financial Turmoil and the Choice of Exchange Rate Regime," Working Paper 400 (Washington: Inter-American Development Bank).
- Hayek, Friedrich (1990), *Denationalisation of Money – The Argument Refined*, third edition (London: Institute of Economic Affairs).
- Honohan, Patrick and Philip Lane (1999), "Will the Euro Trigger More Monetary Unions in Africa?," paper prepared for a Conference on EMU and its Impact on Europe and the Developing Countries, Helsinki, Finland, November 11-12.
- Hale, David D. (1995), "Is it a Yen or a Dollar Crisis in the Currency Market?," *Washington Quarterly* 18: 4 (Autumn), 145-171.
- Hartmann, Philipp (1998), *Currency Competition and Foreign Exchange Markets: The Dollar, the Yen and the Euro* (Cambridge: Cambridge University Press).
- Joint Economic Committee of the Congress (1999), *Joint Economic Report 1999* (Washington).
- Krueger, Russell and Ha, Jiming (1996), "Measurement of Circulation of Currencies," in Paul D. Mizen & Eric J. Pentecost, eds., *The Macroeconomics of International Currencies: Theory, Policy and Evidence* (Brookfield, VT: Edward Elgar): ch. 4.
- Krugman, Paul R. (1992), "The International Role of the Dollar," in Paul R. Krugman, *Currencies and Crises* (Cambridge, MA: MIT Press), ch. 10.
- Makinen, Gail E. (1998), "Euro Currency: How Much Could It Cost the United States?," CRS Report 98-998E (Washington: Congressional Research Service).
- McCauley, Robert N. and William R. White (1997), "The Euro and European Financial Markets," in Paul R. Masson, Thomas H. Krueger, and Bart G. Turtelboom, eds., *EMU and the International Monetary System* (Washington: International Monetary Fund), ch. 12.
- Orléan, Andre (1989), "Mimetic Contagion and Speculative Bubbles," *Theory and Decision* 27:1-2, 63-92.
- Porter, Richard D. and Judson, Ruth A. (1996), "The Location of U.S. Currency: How Much Is Abroad?," *Federal Reserve Bulletin* 82: 10 (October), 883-903.
- Portes, Richard and Hélène Rey (1998), "The Emergence of the Euro as an International Currency," in David Begg, Jürgen von Hagen, Charles Wyplosz, and Klaus F. Zimmermann, eds., *EMU: Prospects and Challenges for the Euro* (Oxford: Blackwell), 307-343.
- Rogoff, Kenneth (1998), "Blessing or Curse? Foreign and Underground Demand for Euro Notes," in David Begg, Jürgen von Hagen, Charles Wyplosz, and Klaus F. Zimmermann, eds., *EMU: Prospects and Challenges for the Euro* (Oxford: Blackwell), 261-303.
- Schaede, Ulrike (2000), "After the Bubble: Evaluating Financial Reform in Japan in the 1990s" (San Diego, CA: University of California at San Diego, unpublished).
- Solomon, Lewis D. (1996), *Rethinking Our Centralized Monetary System: The Case for a System of Local Currencies* (Westport, CN: Praeger).
- Thygesen, Niels et al. (1995), *International Currency Competition and the Future Role of the Single European Currency*, Final Report of a Working Group on European Monetary Union-International Monetary System (London: Kluwer Law International).

- Vaubel, Roland (1977), "Free Currency Competition," *Weltwirtschaftliches Archiv* 113:3, 435-461.
- Walter, Norbert (1998), "An Asian Prediction," *The International Economy* 12:3 (May/June), 49.
- Weatherford, Jack (1998), "Cash in a Cul-de-Sac," *Discover* (October), 100.
- Williamson, John (1999), "The Case for a Common Basket Peg for East Asian Currencies," in Stefan Collignon, Jean Pisani-Ferry, and Yung Chul Park, eds., *Exchange Rate Policies in Emerging Asian Countries* (London: Routledge), ch. 19.
- Wriston, Walter (1998), "Dumb Networks and Smart Capital," *Cato Journal* 17:3 (Winter), 333-344.
- Wyplosz, Charles (1999), "An International Role for the Euro?," in Jean Dermine and Pierre Hillion, eds., *European Capital Markets with a Single Currency* (Oxford: Oxford University Press), ch. 3.

