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What does the international currency system really look like?

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ABSTRACT

There has been a lot of debate lately about the shape of the international currency system. Increasingly, we are told, the world is moving toward a multicurrency system with several poles, implying that the system is becoming more competitive. Polarity, however, is a notoriously crude measure of the level of competition in any kind of system, economic or political. If analysis is to be at all accurate, it should take into account not only the number of poles in a system but also the inequalities among them –an alternative approach encompassed by the concept of concentration. In this paper we make use of the concept of concentration to provide a more accurate picture of the competitive structure of the currency system today. When taking account of concentration as well as polarity, our results suggest that the competitive structure of the system is little changed over a period stretching back more than two decades.

KEYWORDS

International currency; multicurrency system; dollar; euro; polarity; concentration.

There has been a lot of loose talk lately about the shape of the international currency system. Half a century ago matters were simple. There was just one truly international currency, the United States (US) dollar, and its reach was global. The system could fairly be described as unipolar, a virtual monopoly. But then new rivals gradually emerged to challenge America's greenback, including for a time Germany's Deutsche mark (DM), later Japan's yen (now fading), and most recently Europe's euro (replacing the DM). And just over the horizon looms the Chinese yuan, also known as the renminbi or RMB (the 'people's currency'),

which many see as the international money of the future. More and more, we are told, the world is moving toward a multicurrency system, with several poles. 'A world of multiple international currencies is coming,' declares the noted economist Barry Eichengreen (2011: 150). Echoes the World Bank (2011: 125–26), 'the most likely scenario for the international monetary system is a multicurrency system centered around the US dollar, the euro, and the renminbi'. Indeed, according to some, the future has already arrived. In the words of C. Fred Bergsten (2011), a well-known commentator, 'the international monetary system is already becoming bipolar, and may soon be tripolar'. In the words of the European Central Bank (ECB, 2012: 11), 'the international monetary system is already on the verge of becoming tripolar'. Two prominent French economists (Bénassy-Quéré and Pisani-Ferry, 2011) speak of 'the long march towards a multipolar monetary regime'. Multipolarity, it appears, is the new normal.

The implication is that the currency system is becoming more competitive. Polarity, however, is a notoriously crude measure of the level of competition in any kind of system, economic or political. As Edward Mansfield (1993) long ago reminded us, using polarity alone implies that any inequalities among the major players are basically unimportant. In effect, poles are assumed to be structurally equivalent – not significantly different from one another in terms of capabilities or influence. That is an improbable notion at best. In reality, the competitiveness of key players is apt to be anything but uniform. If description of a system is to be at all accurate, it should take into account not only the number of poles but also the inequalities among them – an alternative approach encompassed by the concept of *concentration*. If we really want to know how competitive a system is, we need to think in terms of concentration, not just polarity. Concentration can integrate inequalities and polarity in a single measure of competitive structure.

The purpose of this paper is to make use of the concept of concentration alongside polarity to provide a more accurate picture of the competitive structure of today's international currency system. This is a matter of theoretical as well as empirical importance. Once a money becomes international, its issuer gains both financial benefits and political influence. Competition between currencies thus has real and identifiable consequences, affecting both the level of economic welfare and the balance of power among states (Cohen, 1998). Students of the currency system are interested in explaining or predicting outcomes – inter alia, the degree of volatility in monetary relations, the risk of crisis, the distribution of income and wealth, and the uses and limits of power. But how can any of these be studied unless we can first correctly describe what the system looks like? Serious analysis must begin with accurate measurement.

An issue is the degree of rivalry among the world's major currencies. Is the system today really becoming more competitive, as the idea of multipolarity implies? Are we already on the verge of something like an oligopoly, with several popular currencies (poles) contesting for market share? Or has the erosion of the dollar's past 'hegemony' been exaggerated, despite the emergence of challengers? An accurate answer to these questions is critical to new thinking about the political economy of international monetary relations. Our analysis suggests that loose talk of an increasingly competitive currency system is at best premature. A future of multipolarity may yet arrive, but there is no evidence that any of this has happened *yet*. Taking account of concentration as well as polarity, it appears that the competitive structure of the system is little changed over a period stretching back more than two decades. Assertions to the contrary are simply not consistent with the facts.

INTERNATIONAL CURRENCIES: A PRIMER

A flourishing world economy requires some kind of internationally acceptable money. Otherwise, nations would be reduced to crude barter, severely limiting gains from cross-border trade or investment. What form should an international money take? From a strictly economic point of view, a single supranational currency would seem to be most appealing, since transactions costs would be minimized. As Nobel laureate Robert Mundell has quipped, emphasizing efficiency considerations, the optimum number of currencies is like the optimum number of gods – 'an odd number, preferably less than three'.[1] But does anyone seriously believe that in a fragmented world of nearly two hundred sovereign states, credible agreement can be reached on terms for the creation and management of a genuine global money? From a political point of view the option seems unattainable, even risible. Much more realistic is the prospect that the world will continue in the future, as it has in the past, to rely mainly on a limited selection of national currencies to play vital international roles.

Historically, a pronounced hierarchy has always existed among the world's diverse moneys in what Benjamin Cohen (1998, 2004) has characterized as the Currency Pyramid. From the days of the earliest coins in ancient Asia Minor, competition among currencies has thrown up one or a few market favorites that, for shorter or longer periods of time, predominate in cross-border use and set a standard for all other moneys. A common view holds that normally just one money reigns supreme. As one commentary put it not long ago, 'at any one point in time, there tends to be a single dominant currency in the financial world, not two or more... In the currency markets the spoils go to the victor, alone; they are not shared' (Persaud, 2004: 145). But that perspective is patently inaccurate.

It was certainly not the case during the interwar period, as the greenback gradually eclipsed Britain's pound sterling. Typically, it has not been the case even when one currency clearly prevailed, as during the decades before World War I (Lindert, 1969). Though sterling was then the world's leading money, both the French franc and German mark also enjoyed widespread popularity, particularly on the European continent. As Eichengreen (2007: 145) writes, the 'argument that competition for reserve-currency status is a winner-take-all game holds little water either analytically or historically'. Historical research by Eichengreen and his colleague Marc Flandreau (Eichengreen and Flandreau, 2009, 2012) demonstrates that it is in fact very rare for a single money to come to dominate as much as the dollar did in the unique circumstances of the first years after World War II, and that era did not last very long. A multiplicity of international currencies is much more the norm.

But that does not mean that the currencies at the top of the pyramid are typically equivalent. To the contrary, leading moneys are much more likely to differ sharply in terms of both who uses them and for what purpose. Two critical dimensions are involved: scope and domain. By *scope* we mean the range of roles that a money may play in the world economy. Is a currency used for many distinct purposes or just a few? By *domain* we mean the geographic scale of use. Is a currency used in most parts of the globe or in just a limited number of countries or regions? Both dimensions are important indicators of the internationalization of a national money.

That currency internationalization involves a multiplicity of roles is of course widely recognized in the scholarly literature. There is, in fact, a standard taxonomy for characterizing the scope of an international currency, which separates out the three familiar functions of money – medium of exchange, unit of account, store of value – at two levels of analysis: the private market and official policy, adding up to six roles in all. The taxonomy is summarized in Table 1, with each box of the matrix representing a different market segment or sector of activity. Sources

Table 1 The roles of international money

	Functions of money		
Levels of analysis	Medium of exchange	Unit of account	Store of value
Private	Vehicle currency (foreign exchange trading), trade settlement	Trade invoicing	Investment currency
Official	Intervention currency	Exchange rate anchor	Reserve currency

generally speak of the separate roles of an international currency at the private level as a vehicle for foreign-exchange trading (medium of exchange), as an instrument for trade invoicing and settlement (unit of account and medium of exchange), and as a means to facilitate cross-border investment (store of value). At the official level, we speak of a money's roles as intervention currency (medium of exchange), an exchange rate anchor (unit of account), or a reserve currency (store of value). Though to some extent interdependent, each of the six roles is distinct in practical as well as analytical terms.

Likewise, it is widely recognized that the geographic scale of currency use may vary widely, from the truly global to just a few countries or a single region. In the nineteenth century, both the franc and the mark could legitimately claim international currency status, alongside sterling, but the pound's domain was clearly far more extensive than either of them (Lindert, 1969). Conversely, during the interwar years the pound's domain was gradually reduced to the British Commonwealth and Empire plus a few others – what became known as the sterling area – even as the greenback was going global (Eichengreen and Flandreau, 2009, 2012). A currency may bestride the world like a Colossus, as the dollar did after World War II, or serve only a small number of neighboring states, as the South African rand has long done in Southern Africa.

Today there is only one currency – the dollar – that plays all six roles in virtually every part of the world. Even now, decades after World War II, the greenback remains unique, a truly global money. Other currencies have come to enjoy international status, the euro and yen in particular. But they all remain rather more limited in terms of scope or domain, or both. Superficially, it might not seem unreasonable to brand the contemporary system as multipolar or moving in that direction, as many observers now do. Given the enormous inequalities among the players, however, that is also incomplete and possibly misleading as a description of the system's overall competitive structure. More refined measurement of the shape of the system would seem called for.

PRIOR EFFORTS

Monetary scholars are not insensitive to the issue of inequality among international currencies. Prior efforts to quantify differences, however, have been sadly inadequate. Typically, one single role is selected for comparative analysis and treated as a proxy for all the diverse functions that an international money may perform, ignoring available data on other roles.

Most frequently, analysis tends to focus on the reserve currency role, widely regarded as the ultimate confirmation of a money's international acceptability. The share of each currency in the total of world reserves is

assumed to stand for its relative ranking among its peers or its prospects for the future. The shape of the system as a whole, its competitive structure, is assumed to be indicated by a comparison of relative 'market shares'. Representative are economists Menzie Chinn and Jeffrey Frankel (2007, 2008), who not long ago made waves by predicting that the euro would surpass the dollar as an international currency by as early as 2015, making the system more competitive. Their forecast, based on formal modeling and rigorous econometric analysis, was technically impeccable. Their projections, however, were limited exclusively to central bank reserve holdings, ignoring all other uses.

Chinn and Frankel's timing, obviously, was unfortunate. Since their work was published, the euro zone has plunged into a prolonged banking and sovereign debt crisis. As a result, the ascent of Europe's currency has clearly stalled, at least for the moment. But that has not stopped other analysts from emulating the Chinn-Frankel methodology, particularly to assess prospects for the dollar's newest challenger, the RMB.[2] Most widely publicized has been the work of economist Arvind Subramanian (2011), who confidently predicts a glowing future for the yuan. Using a model similar to that of Chinn and Frankel, he makes an equally audacious forecast, concluding that 'The renminbi could rival or even overtake the dollar as the primary reserve currency as soon as the early years of the next decade' (Subramanian 2011, 99). Lacking a crystal ball, we have no choice but to reserve judgment on whether Subramanian's timing will turn out to be any more fortuitous. The outlook is cloudy.

What is clear is that selecting just a single role for comparative analysis is a risky research strategy. The practice is defended in terms of linkages among an international currency's diverse functions. As one source puts it:

> The assumption is that reserve currency holdings are a good proxy for the overall international role of a currency... the international roles of a currency tend to be related and jointly determined by more fundamental factors. There are economies of scope. (Chen and Peng, 2010: 120–21)

But is that persuasive? Interdependencies among a currency's international roles undoubtedly exist, as we noted above. Economies of scope cannot be denied. But that does not rule out large differences in actual use for various purposes, as we shall see below. In practice, the correlation across market segments for any given currency is far from strong. To believe otherwise is to succumb to the fallacy of composition: the notion that one can infer that something is true of the whole from the fact that it is true of some part of the whole. The premise of the strategy is, to say the least, dubious.

Somewhat more persuasive are studies that explicitly acknowledge the relative looseness of linkages across market segments. This is done by selecting several roles for comparative analysis, rather than just one function alone. Market shares are compared across multiple sectors of activity. That is the approach, for instance, traditionally followed by the European Central Bank in its annual reports on the international role of the euro (European Central Bank, 2012). The euro's share of various sectors of activity, from the foreign exchange market and trade invoicing to international debt markets and central bank reserves, are calculated and contrasted with other currencies like the dollar. The approach has been widely used to study prospects for both the euro (Papaioannou and Portes, 2008) and the yuan (Prasad and Ye, 2012). The advantage of the approach is that it gives a more realistic picture of the global system's inherent complexity, explicitly allowing for varying inequalities among the players.

But that still leaves a problem, since the approach fails to formally integrate inequalities and polarity in a way that would permit generalization about the system's overall shape. In most instances, each role is compartmentalized and addressed more or less on its own. No attempt is made to produce a more comprehensive portrait of the system as a whole. A rare exception comes from economist Christian Thimann (2008), who has developed a composite measure of what he calls a currency's 'global role' based on the size and stage of development of its financial markets and the scope of financial instruments available in the currency. Measurement and rankings are calculated using 15 size indicators and 16 structural indicators for each of 22 currencies. The research design is ambitious and points in the right direction. Regrettably, however, for all its plethora of statistical variables, it is limited to just one of the six roles of an international currency – namely, the investment (store-of-value) role in financial markets – and thus falls short of truly comprehensive coverage.

Perhaps closest to what we believe is needed is a composite indicator developed recently by the World Bank (2011: 131–32) as part of a major study of multipolarity in the global economy. The indicator is intended to provide a broad overview of the relative importance of international currencies, encompassing three of the six roles identified in Table 1. Based on principal components analysis, the measure is calculated according to shares of foreign exchange market turnover (vehicle currency role), outstanding international bank claims and bonds (investment currency role), and official reserves (reserve currency role). Unfortunately, the data to date cover only a short time span, from 1999 to 2009, making it difficult to generalize about longer-term trends. The Bank's results seem to signal a modest increase of competitiveness among leading currencies, showing an increase of about 10 per cent in the euro's

importance after its birth in 1999 (mostly in its first five years), mirrored by a six per cent decline for the dollar, a five per cent decline for the yen, and minor changes elsewhere. But analysis over a longer time horizon, as we shall show below, suggests that the apparent increase is in fact illusory. Over the longer term, we find little change in the general pattern of currency competition.

CONCENTRATION

In contrast to prior efforts, we believe that a more fruitful approach would go beyond polarity alone to make use as well of the concept of *concentration*, borrowed from the discipline of economics. The concept of concentration first gained traction in political science as the basis for the now well known Correlates of War (COW) dataset formulated by J. David Singer and associates in 1972 (Singer *et al.*, 1972). That foundational work used a systemic concentration of power formula to calculate the polarity of a given international system. The purpose was to test whether different distributions of power might systematically influence the likelihood of political–military conflict. Though students of international relations (IR) today may quarrel about the quality of the COW dataset, they continue to make use of the idea of concentration, particularly as a means to gauge the distribution of power among states. Concentration helps IR scholars to distinguish among different types of international political systems at a given period of time. Typically, four types of system are distinguished: unipolar, bipolar, tripolar, or multipolar.

In economics the concept of concentration was first developed for the study of industrial organization – the size of firms in an individual sector and the degree of competition among them. The greater the concentration of a market, the lower is its level of competition. The concept is widely applied in competition law and anti-trust regulation and has also been used to analyze the commodity or geographic composition of international trade (McKeown, 1991; Mansfield, 1994). This paper argues that concentration can also be usefully deployed to measure the structure of competition in the currency system. To our knowledge the concept has never previously been applied to the study of any aspect of international monetary relations.

For purposes of practical analysis, two tools have become standard among economists to measure market competition – concentration ratios (also known as N-firm ratios) and the so-called Herfindahl–Hirschman Index (HHI). Concentration ratios are relatively easy to calculate. First, the leading firms in the industry are identified, with the number N determined by sectoral characteristics. Where some industries (such as large commercial aircraft or automobiles) have very few rival firms,

warranting a small N, in other sectors a larger number might be more appropriate. Then the market shares of all the selected firms (expressed as fractions) are simply added up to give an overall percentage. But concentration ratios are also of limited analytical value, since they provide little insight into the distribution of firm size and also take no account of smaller firms below the selected threshold. All they measure is the aggregate market share of a given number of firms. They are thus a relatively crude indicator of market *structure*.

A more complete picture is provided by the HHI, named after the economists Orris Herfindahl and Albert Hirschman (Hirschman, 1964). The HHI is defined as the sum of the *squares* of the market shares of all the firms in an industry (again expressed as fractions) – not just the biggest firms but all others as well to ensure that the total of percentages adds up to 100 per cent. Squaring market shares prior to summation gives added weight to larger firms, thus taking account of the distribution of firm size as well as the number of leading players. Results are proportional to the average of market shares, weighted by market share. Formally, the HHI is calculated as follows:

$$\mathrm{HHI_t} = \sum_{i=1}^{N_t} S^2_{\mathrm{it}}$$

where HHI is the Herfindahl–Hirschman Index at a given time, S is the market share of firm i at time t, and N is the number of firms at time t. Increases in the HHI indicate a decrease in competition and can range from $1/N$ (the equivalent of perfect competition) to 1.00 (monopoly). Anything above 0.25 (25 per cent) is generally considered by US anti-trust regulators to be an excessively high level of concentration.

To illustrate, consider two cases of an industry in which the top four firms together (CR4) are assumed to account for 80 per cent of sales and 20 other firms account for the remaining 20 per cent (one per cent each). In one case, each of the four large firms controls 20 per cent of the market; in the other, one firm controls 50 per cent and the other three control 10 per cent each.

Case 1. CR4 = .20 + .20 + .20 + .20 = .80 or 80%	Case 2. CR4 = .50 + .10 + .10 + .10 = .80 or 80%

Clearly, the degree of competition is greater in the first case. The second comes closer to dominance by one firm, approaching monopoly. The difference between the cases is obscured if we use a simple concentration ratio, since with that approach the two appear to be identical. In both, the ratio is 80 per cent.

Using the HHI, by contrast, we clearly see the difference.

Case 1. HHI	Case 2. HHI
$= 4(.20^2) + 20(.01^2)$	$= .50^2 + 3(.10^2) + 20(.01^2)$
$= 4(.04) + 20(.0001)$	$= .25 + 3(.01) + 20(.0001)$
$= .16 + .002$	$= .25 + .03 + .002$
$= .162$	$= .282$

The HHI or some variant thereof have frequently been employed in the IR literature to explore the nature of the global political system and the risk of international conflict (Mansfield, 1992). In the empirical analysis to follow in this paper we will make use of both concentration ratios and the HHI, in addition to measures of polarity, to explore the nature of the global currency system today.

DATA

We begin with the data on market shares. Ideally, we would wish to include measures of all six of the roles of an international currency. In practice, however, that is just not possible. For two of the roles – trade invoicing and settlement at the private level and currency intervention at the official level – adequate statistics are lacking. For trade invoicing and settlement, some survey material is available,[3] but the coverage is far from complete. For currency interventions, most governments prefer to keep their operations confidential.

More is known about the anchor role of international currencies, but measurement for comparative purposes is also problematic. A money functions as an anchor when other currencies are pegged to it in one way or another. But it is not always easy to know when such an exchange rate relationship exists. The link is obvious when a formal (de jure) peg is announced but more difficult to specify when pegs are informal (de facto) or maintained in relation to a 'basket' of currencies. And there is also a problem of estimating the relative importance of diverse exchange rate links. Simply adding up the number of currency pegs, formal or informal, is clearly inadequate. As many as 40 countries currently align their currencies to some extent with the euro (as compared with some 60 countries that align more or less closely with the dollar). But of those 40, four are European mini-states (Andorra, Monaco, San Marino, and the Vatican) and another 16 include the 14 members of the CFA franc zone in Africa together with two affiliated economies (Cape Verde and Comoros), all small and poor countries. How do we compare these anchor relationships with the links to the dollar maintained by much larger economic powers like China, Hong Kong, and Saudi Arabia? Recent studies have tried weighting existing pegs by either income or trade shares, with mixed results (Cobham, 2008; Bracke and Bunda, 2011).

That leaves us, therefore, with just three of the six functions identified in Table 1. Not accidentally, these are the same three functions that are

included in the World Bank's composite indicator – the roles as vehicle currency, investment currency, and reserve currency. These are the categories for which adequate data are available. Our analysis here will focus on these same three roles but with considerably more detail than in the World Bank study and over a longer time span. Five currencies clearly dominate across all three roles: the dollar, euro, yen, pound sterling, and Swiss franc. Notably absent is China's tightly controlled yuan, which has yet to make any significant impact in any of the three market segments.

For the vehicle and investment currency roles, our source is the Bank for International Settlements. Data on the vehicle currency role have been available since 1989, when the BIS began a systematic triennial survey of global foreign exchange market activity. The latest survey available to us as this paper was written was published in 2010 (BIS, 2010). At the level of wholesale foreign exchange trading around the world, a small handful of currencies have long dominated as intermediaries (vehicles) for trades between less widely used monies. A vehicle role is a direct consequence of high market turnover, which yields substantial economies of scale. Typically, it will be less expensive for a market agent to sell a local currency for a vehicle currency and then use the vehicle currency to buy the needed foreign money than it would be to exchange one infrequently traded money directly for another.

A summary of market shares for the most widely used vehicle currencies since 1989 is provided in Table 2. Changes over time are charted in the corresponding Figure 1. Market shares in the foreign exchange market are measured by the percentage of transactions in which each currency appeared. Since every transaction involves two currencies, percentages add up to 200 per cent. The survey is always taken at the same time of year, once every three years, on or near April 30. In Table 2 and Figure 1, as in all subsequent tables and figures, the shares shown for the euro prior to its birth in 1999 are calculated as the sum of the shares of the Deutsche mark, French franc, and other so-called euro 'legacy' currencies (including the old European Currency Unit or ECU).

Table 2 Vehicle currency role: currency shares of the global foreign exchange market (percentage of average daily turnover)

	1989	1992	1995	1998	2001	2004	2007	2010
US dollar	90.0	82.0	83.3	87.3	89.9	88.0	85.6	84.9
Euro	33.0	55.2	59.7	52.5	37.9	37.4	37.0	39.1
Japanese Yen	27.0	23.4	24.1	20.2	23.5	20.8	17.2	19.0
Pound sterling	15.0	13.6	9.4	11.0	13.0	16.5	14.9	12.9
Swiss franc	10.0	8.4	7.3	7.1	6.0	6.0	6.8	6.4
Other currencies	25.0	17.5	16.2	21.9	29.7	31.3	38.5	37.7

Note: Percentages add up to 200 per cent.
Source: Bank for International Settlements

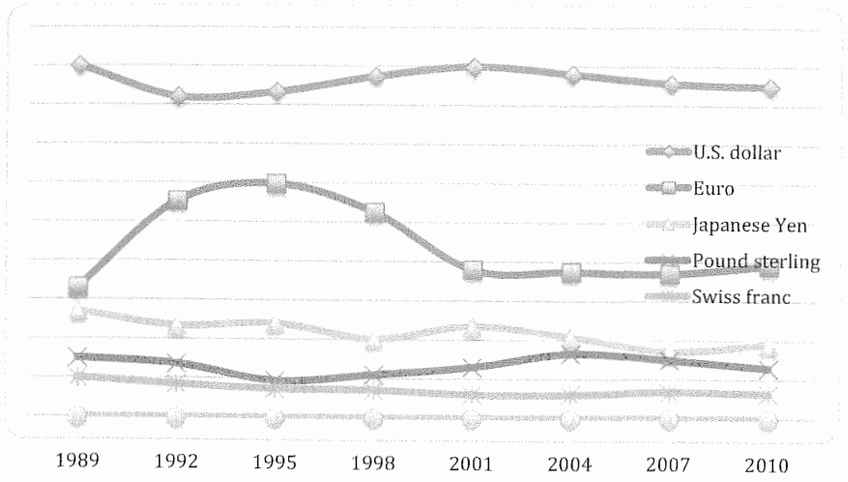

Figure 1 Vehicle currency role: currency shares of the global foreign exchange market (percentage of average daily turnover).
Source: Bank for International Settlements

The apparent sharp drop in the recorded share of the euro after 1998 can be attributed to the formal start of Europe's monetary union, which eliminated trading among the euro's constituent currencies. From 1999 onward, transactions among members of the euro zone became effectively 'domestic' and thus were no longer treated as part of the foreign exchange market. Unfortunately, there is no easy way to strip out these 'domestic' transactions from the data prior to 1999.

Statistics on international banking and securities, including data on the main currencies used in global financial markets, have long been published by the BIS on a regular basis in the quarterly reports of its Monetary and Economic Department. A summary of market shares of the principal investment currencies is provided in Tables 3 and 4, with changes charted in the corresponding Figures 2 and 3. Table 3 and Figure 2 show trends in

Table 3 Investment currency role: currency shares of the international banking market (percentage of total cross-border bank claims)

	1989	1992	1995	1998	2001	2004	2007	2010
US dollar	58.4	52.3	45.0	48.5	48.4	43.1	41.9	43.7
Euro	17.4	22.8	27.5	26.0	31.8	39.1	39.6	39.4
Japanese Yen	13.8	12.3	14.1	10.0	8.1	4.9	3.4	3.7
Pound sterling	3.5	3.9	3.5	5.0	5.0	6.4	7.7	5.7
Swiss franc	4.1	4.3	3.9	2.9	2.3	1.8	1.6	1.5
Other currencies	2.8	4.5	5.9	7.6	4.5	4.8	5.8	7.0

Source: Bank for International Settlements.

Table 4 Investment currency role: currency shares in the international securities market (percentage of total issues outstanding)

	1993	1995	1998	2001	2004	2007	2010
US dollar	42.4	38.5	38.0	51.4	40.4	36.0	37.8
Euro	24.7	26.8	24.2	30.0	43.0	47.3	46.0
Japanese Yen	13.1	16.2	11.7	6.9	4.3	2.7	2.6
Pound sterling	7.1	6.8	8.0	7.2	7.5	8.6	8.0
Swiss franc	7.3	6.8	3.8	2.0	1.8	1.5	1.4
Other currencies	5.5	4.9	14.3	2.5	3.0	4.0	4.2

Note: Securities markets include international bonds, notes, and money market instruments. No data are available for 1989. The data in the first column are from September 1993.
Source: Bank for International Settlements.

the currency composition of the international banking market, comprising all cross-border banking claims. Table 4 and Figure 3 show the currency composition of the international securities market, encompassing money market instruments as well as notes and bonds. The data are presented at three-year intervals to parallel the vehicle currency data and depict claims outstanding at the end of the first quarter of each year shown. The only exceptions are to be found in Table 4 and Figure 3, due to the fact that comprehensive statistics for the international securities market are not available prior to September 1993. No entries are shown in Table 4 or Figure 3 for 1989, and the data for 1993 are treated as a proxy for 1992.

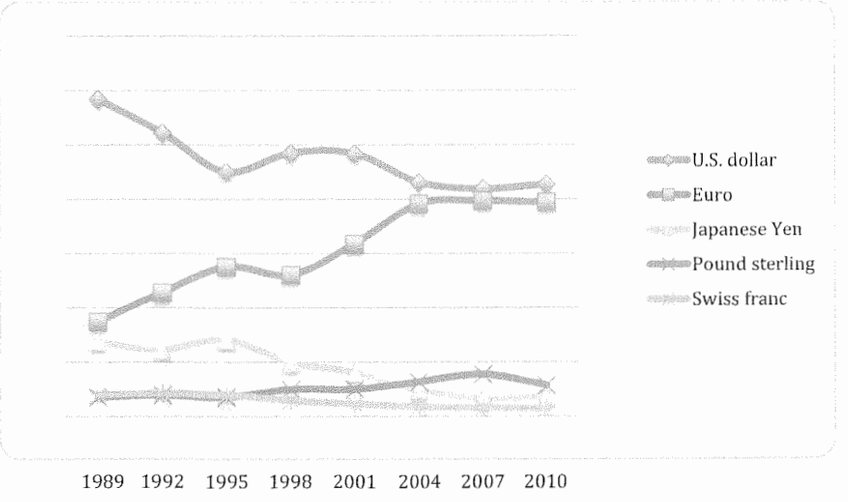

Figure 2 Investment currency role: currency shares of the international banking market (percentage of total cross-border bank claims).
Source: Bank for International Settlements

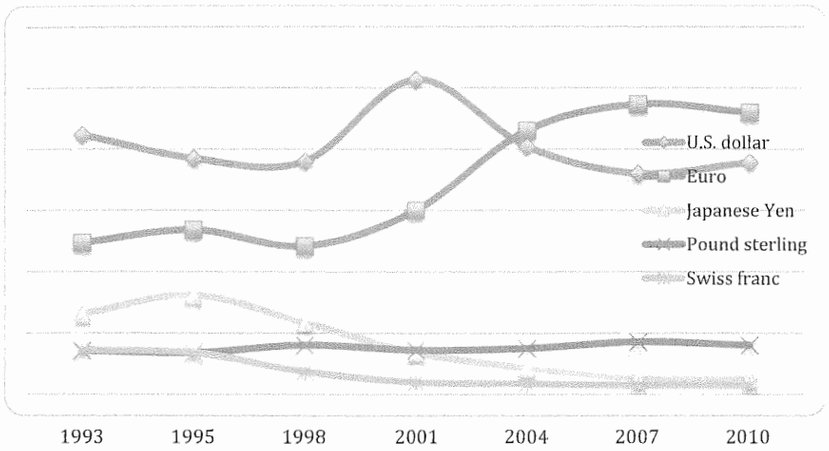

Figure 3 Investment currency role: currency shares in the international securities market (percentage of total issues outstanding).
Source: Bank for International Settlements

For the reserve currency role the best available source is the International Monetary Fund (IMF), which for many years included information in its annual reports on the foreign exchange holdings of central banks. Since 2005 the presentation has been formalized in a public database on the Currency Composition of Official Foreign Exchange Reserves (COFER), published quarterly.[4] The COFER data are regrettably incomplete, since not all countries report the distribution of their reserve holdings. Most importantly, several Asian central banks (including China) are absent. *Faute de mieux*, however, the numbers for so-called 'allocated' reserves are the best we have. Although only about 55 per cent of global reserves included, we have no choice but to treat them as sufficiently representative to be useful for analytical purposes. A summary of market shares for the principal reserve currencies is provided in Table 5, with

Table 5 Reserve currency role: currency shares of foreign exchange reserves (percentage of total 'allocated' reserves)

	1989	1992	1995	1998	2001	2004	2007	2010
US dollar	52.4	55.1	56.8	65.7	71.5	67.1	64.1	61.5
Euro	34.8	26.0	22.9	14.5	19.2	23.8	26.3	26.2
Japanese Yen	7.4	7.5	6.8	5.3	5.0	4.4	2.9	3.8
Pound sterling	2.6	3.0	3.1	3.8	2.7	2.8	4.7	4.0
Swiss franc	1.6	1.0	0.8	0.7	0.3	0.4	0.2	0.1
Other currencies	1.2	7.4	9.6	9.9	1.3	1.6	1.8	4.4

Source: International Monetary Fund.

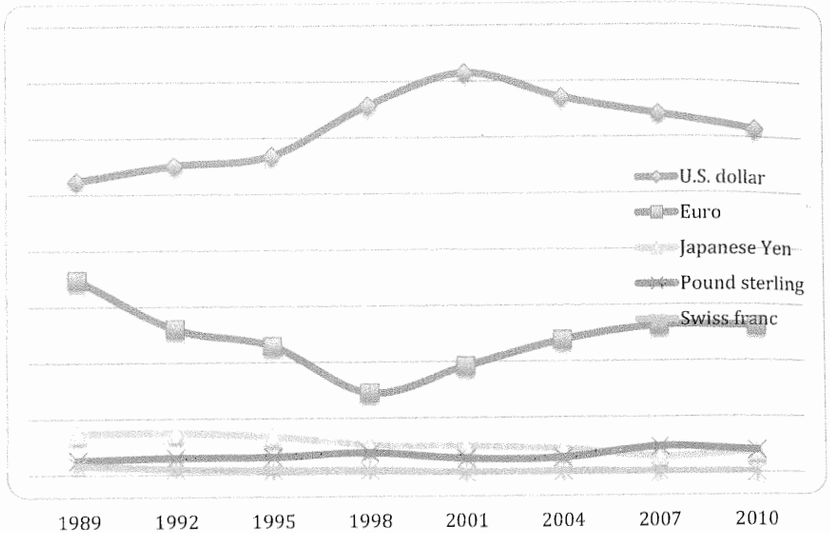

Figure 4 Reserve currency role: currency shares of foreign exchange reserves (percentage of total foreign exchange reserves).
Source: International Monetary Fund

changes over time charted in Figure 4. Shares are calculated as a percentage of allocated reserves only. Again, the data are presented at three-year intervals to parallel the vehicle currency data and depict amounts outstanding at the end of the first quarter of each year shown.

ANALYSIS

What does the data tell us? Much can be learned about both the presumed polarity of the currency system and its overall degree of concentration.

Multipolarity?

To begin, the data suggest that predictions of a new normal of multipolarity are, at best, premature. Even a quick glance confirms that in reality the global system today is dominated in varying degrees by just two currencies: the dollar and the euro. This is a pattern that has persisted consistently for more than two decades. Routinely, the dollar and euro together predominate across the board. Though the yen, pound sterling, and Swiss franc are used widely enough to warrant separate mention, they are clearly no more than 'also-rans' in the international currency race. For no role is their market share more than a few percentage points – certainly not great enough to qualify for description as a distinct pole.

And even further back is the yuan, which is nowhere to be seen in any sector, owing in particular to China's extensive exchange restrictions and capital controls. In the foreign exchange market the RMB's share in 2010 amounted to less than one-half of one per cent of total transactions – admittedly a notable increase from less than one-tenth of one per cent of trades as recently as 2004, but still way back in the pack, running neck and neck with the likes of the Polish zloty and the Turkish lira. In the international bond market an offshore market for yuan-denominated bonds (so-called 'dim sum' bonds) has begun to develop in Hong Kong, with new issues in 2011 topping 174 billion yuan ($27.6 billion), up from 40 billion yuan ($6.3 billion) in 2010 and a cumulative total of just 22 billion yuan ($3.3 billion) previously. Though not an insignificant rate of increase, that is still a miniscule volume by global standards. The only significant amount of international banking done in yuan is also in Hong Kong, where an offshore market for RMB denominated bank deposits was authorized in 2004, growing to a peak of some 627 billion yuan ($100 billion) in November 2011 before leveling off – again miniscule by global standards. And any incentive for central banks to hold RMB in their reserves is severely blunted by the currency's continuing inconvertibility. Overall, the yuan remains a midget among international currencies, despite all the hype lately about an emerging tripolarity.

Bipolarity?

What about bipolarity? As indicated, the dollar and euro together clearly dominate the data. Does that mean, as some suggest (e.g. Auboin, 2012), that the system today can therefore be described as a duopoly? Even that is doubtful, given the evident disparities between the two currencies.

Much depends on how we measure bipolarity. We know that the notion of a pole is somewhat ambiguous. It is not always easy to know when an actor might, or might not, qualify as a polar power. But a variety of indicators have been suggested in the IR literature to give the concept of polarity more precision. Perhaps the most useful is a set of definitions outlined by Mansfield (1993: 113) based on previous efforts of Modelski (1974), Thompson (1988), and others:

1. In a *unipolar* system, one state controls 50 per cent or more of the relative capabilities that matter.
2. In a *near-unipolar* system, one state controls more than 45 per cent but less than 50 per cent of relative capabilities and no other state possesses as much as 25 per cent.
3. In a *bipolar* system, two states control at least 50 per cent of relative capabilities and each of the two leading actors possess at least 25 per cent.

Table 6 Summary of currency capacities: US dollar and euro (2010)

	Vehicle	Banking	Securities	Reserve	Average
US dollar	42.5%	42.7%	37.8%	61.5%	48.1%
Euro Area	19.6%	39.4%	46.0%	26.2%	29.5%

By these definitions, the euro would not appear to qualify as a pole co-equal with the dollar. The disparities between the two currencies can be clearly seen in Table 6, which summarizes the shares for the dollar and euro in all four market segments in 2010. For illustrative purposes, a simple arithmetic average of the four ratios is also shown, though without any pretense that this can be considered as anything other than a very raw indicator of the overall competitive structure of the system. The table does not appear to describe a genuine duopoly. Arguably it would be more accurate to describe the system as falling somewhere between bipolar and near-unipolar – perhaps more favorable to the euro than Cohen's (2011) characterization of a 'one-and-a-half currency system,' but certainly not a relationship of equals.

Admittedly, the two currencies are comparable and clearly competitive in the international banking and bond sectors, with roughly equal market shares going back nearly a decade. In these two segments, the relationship is truly bipolar. But that is by no means the case in the foreign exchange market or official reserves, where America's greenback has persistently outstripped the euro by ratios well in excess of 2:1. Since trading among the euro's legacy currencies was eliminated in 1999, use of Europe's money as a vehicle currency has barely budged in relative terms. As a reserve currency, the euro's market share of allocated reserves has actually declined as compared with the aggregate share of its legacy currencies in 1989. In the first years after its birth in 1999, the euro did improve its reserve currency position somewhat at the expense of the dollar. But this was from an artificial peak for the greenback, reflecting the success of the Clinton Administration's 'strong dollar' policy in preceding years. The dollar's share of allocated reserves in 2010 was still higher than it had been in the mid 1990s, while the euro's share peaked in the mid 2000s and in more recent years has actually declined, falling from above 27 per cent in 2009 to below 24 per cent by the end of 2012.

Is the euro's role as a reserve currency underestimated because the calculation of shares is based only on allocated reserves? The biggest reserve holder that is missing from the data is of course China. According to one reputable source (Casarini, 2012), the euro's share of China's reserves might actually have risen to as high as one-third at the end of 2011, while the dollar's share had fallen to just 54 per cent. However, even if we add these amounts to the existing figures for total allocated reserves at end-

2011, we find that the dollar still accounts for as much as 59 per cent of the total, while the euro's share is no higher than 28 per cent. The greenback still outstrips the euro by a ratio of more than 2:1.

At the time of its birth, expectations for the euro were much higher. Europe's new money appeared to enjoy many of the attributes needed for competitive success, including a large economic base, unquestioned political stability, and an enviably low rate of inflation, all backed by a joint monetary authority, the ECB, that was fully committed to preserving confidence in the currency's future value. Yet in practice, after a fast early start, cross-border use of the euro for most purposes leveled off by the middle of its first decade, and under the pressure of Europe's current financial difficulties has even begun to slip back a bit. Informed observers no longer see the euro as a major rival to the greenback. In the words of the noted economist John Williamson (2012: 3): 'For a time it looked as though the euro might constitute a serious competitor, but the recent difficulties in the euro area have resulted in it ceasing to be a threat to the pre-eminence of the dollar'. The euro's recent decline has been most evident in central bank reserve holdings, as noted, and in the international securities market, where the euro share of new issues has dropped sharply. Moreover, it is well known that while the dollar continues to be used virtually everywhere, the euro's domain has remained confined to a limited number of countries with close geographical and/or institutional links to the European Union. Considerations like these highlight why it is essential to think about not only the number of poles in the system but also the inequalities among them.

Concentration ratios

Moving, therefore, beyond polarity to concentration, we begin with some simple concentration ratios as shown in Table 7 and Figures 5 and 6. Even admitting their limited analytical value, concentration ratios represent an improvement over crude notions of polarity alone.

To assure representative coverage, two ratios are shown for each market segment. One is for the dollar and euro alone (N = 2), the two dominant international currencies. The second includes as well the three also-rans – the yen, pound sterling, and Swiss franc (N = 5) – which for now can be considered the only other international currencies of consequence. Again, for illustrative purposes, a simple arithmetic average of all four ratios for each year is also shown.

Notably, the ratios show virtually no net change in the level of concentration in the system. Over the years there have been some fluctuations up and down in the individual measures, especially in the securities sector, but for the most part we find a relatively stable trend. Whether calculated for N = 2 or N = 5, most of the ratios have barely budged from where they were two decades ago.

Table 7 Concentration ratios

Currency role	1989	1992	1995	1998	2001	2004	2007	2010
Vehicle (N = 2)	61.5	68.6	71.5	69.9	63.9	62.7	61.3	62.0
Vehicle (N = 5)	87.5	91.3	91.9	89.1	85.2	84.4	80.8	81.2
Banking (N = 2)	75.9	75.0	72.6	74.5	80.2	82.2	81.5	82.1
Banking (N = 5)	97.2	95.6	94.0	92.4	95.6	95.2	94.2	93.0
Securities (N = 2)	NA	67.0	65.3	62.2	81.4	83.4	83.3	83.8
Securities (N = 5)	NA	94.5	95.1	85.7	97.5	97.0	96.0	95.8
Reserve (N = 2)	87.2	81.1	79.7	80.2	90.7	90.9	90.4	87.7
Reserve (N = 5)	98.8	92.6	90.4	90.0	98.7	98.5	98.2	95.6
Average (N = 2)	74.9	72.9	72.3	71.7	79.0	79.8	79.1	78.9
Average (N = 5)	94.5	93.5	92.9	89.3	94.2	93.8	92.3	91.4

Note: N = 2 is the sum of the market shares of the dollar and euro. N = 5 is the sum of the market shares of the dollar, euro, yen, pound sterling, and Swiss franc. For the vehicle currency role, market shares have been reduced uniformly by one-half from the percentages shown in Table 2.

In the foreign exchange market there is some sign of increased competition as a result of declining shares for the yen, pound sterling, and Swiss franc. The relatively modest amount of business lost by the three also-rans appears to have gone primarily to smaller currencies like the Australian and Canadian dollars or the Swedish krona rather than to the

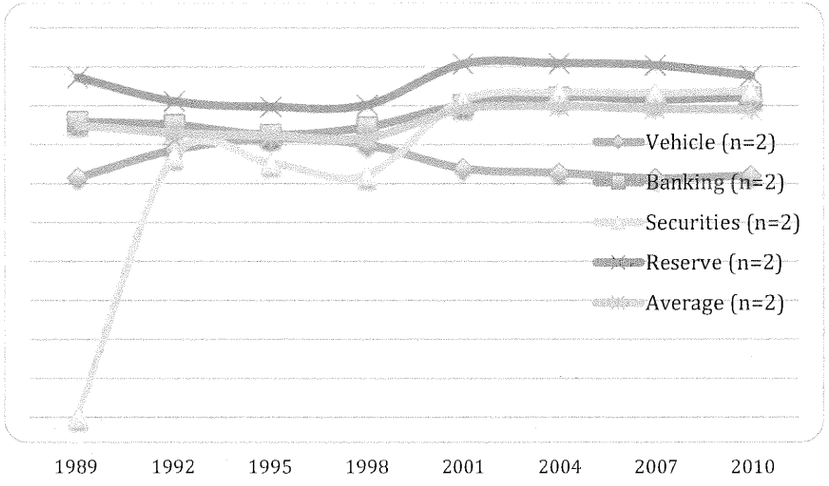

Figure 5 Concentration ratios (N = 2).

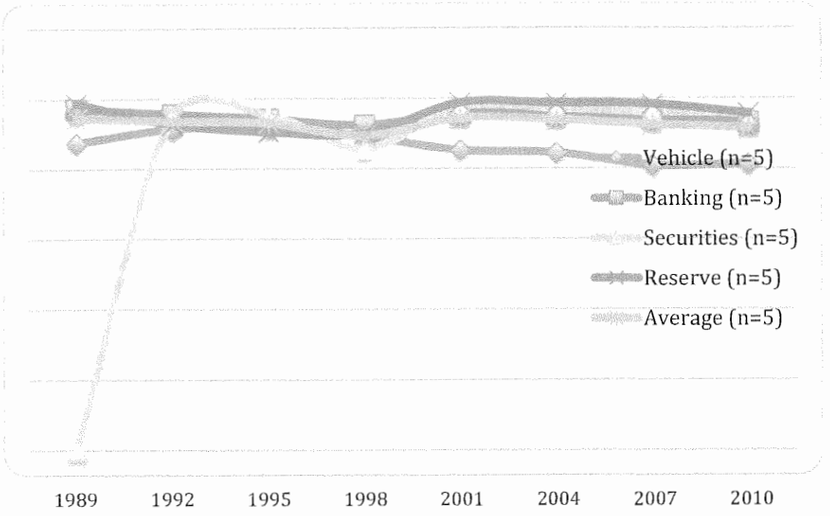

Figure 6 Concentration ratios (N = 5).

greenback or euro. China's RMB has also begun to stake out a role but, with a market share in 2010 of less than one half of one per cent, remains a very minor player. In the banking and securities sectors, by contrast, concentration has actually risen a bit because of notable increases in foreign use of Europe's money. Once the new currency was born, outside borrowers were attracted by the opportunity to tap into the much broader pool of savings created by the consolidation of European financial markets. Both bank lending and securities issues denominated in euros increased substantially. Overall, however, the average level of competition in the global system, as shown by concentration ratios, seems to indicate little net change from the late 1980s to 2010.

Herfindahl–Hirschman Indices

Even more telling is the picture drawn by a calculation of Herfindahl–Hirschman Indices over the same period, as shown in Table 8 and Figure 7. Where concentration ratios simply add up the market shares of top players, the HHI gives us a more complete sense of competitive structure by taking explicit account of functional inequalities. Two contrasting observations demonstrate the value added by the HHI.

On the one hand, we again see for the most part a remarkable stability, rather than decline, in the overall level of concentration in the system, despite some fluctuations in individual sectors. Indeed, if we start with 1992 rather than 1989, there actually appears to have been some net

Table 8 Herfindahl–Hirschman indices summary

	1989	1992	1995	1998	2001	2004	2007	2010
Vehicle currency	0.272	0.272	0.288	0.287	0.280	0.272	0.269	0.269
Banking	0.394	0.346	0.304	0.322	0.347	0.348	0.343	0.347
Securities	NA	0.271	0.258	0.245	0.365	0.357	0.363	0.364
Reserve currency	0.402	0.383	0.390	0.467	0.551	0.510	0.483	0.452
Average	0.358	0.319	0.311	0.331	0.386	0.372	0.365	0.358

increase of concentration over time. Only in the foreign exchange market is a rise of competition confirmed, and that is only by a quite modest margin. In all other segments, the trend of the HHI is stable or even modestly upward, indicating greater concentration.

On the other hand, we see that concentration and polarity do not always move in tandem. The data, as noted, clearly suggest a high degree of unipolarity in both the foreign exchange market and official reserves. In both, the dollar share is more than twice that of the euro. Yet the levels of concentration as measured by the HHI in the two segments are vastly different – strikingly low in the foreign exchange market but much higher in reserves. Inequalities differ significantly for the two currency roles. A result like this illustrates why reliance on the notion of polarity alone can be quite misleading.

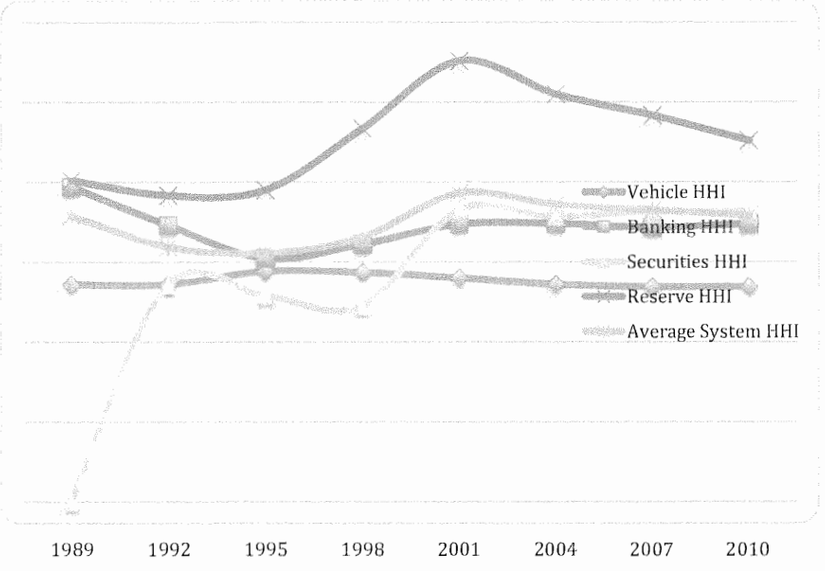

Figure 7 Herfindahl–Hirschman indices.

CONCLUSION

The general conclusion is unmistakable. Contrary to the popular impression of an emerging multipolarity in the global currency system, we find little evidence of a higher level of competition. Quite the opposite, in fact. Even today there appears to be only one true pole in the system – namely, the US dollar. The euro lags behind considerably; also-rans like the yen, pound sterling, and Swiss franc are at best niche players; and the yuan is so far back in the race that it barely even registers as yet.

More to the point, levels of concentration have shown no sign of significant decline. Taking account of inequalities as well as the number of poles, it appears that the most striking feature of the system's competitive structure is its relative stability, rather than any secular change. For more than two decades, the dollar has remained the only truly global currency, still dominant for most purposes. Despite the emergence of rivals to the greenback, the system still cannot be described as anything like a true oligopoly.

Our conclusion is consistent with studies of exchange rate anchoring, which also find little evidence of significant change over time. Representative is a recent ECB survey (Bracke and Bunde, 2011: 5), which found that 'there have been over the past 30 years no systematic or trend shifts in exchange rate practices... The US dollar has remained the main anchor currency, with the euro as a distant second'. Our conclusion appears as well to be consistent with a recent World Trade Organization study of trade invoicing and settlement (Auboin, 2012), which also found a stable pattern of currency use over time.

By contrast, our conclusion would seem to conflict with the analysis of the World Bank, whose composite indicator suggests a considerable shift of competitive positions – in particular, a substantial rise for the euro at the expense of the dollar. As noted, however, the Bank's calculation starts only from 1999 when the greenback was at an artificial peak. Going back to a starting point a decade earlier clearly demonstrates the dangers of generalizing about secular trends on the basis of a limited number of years. Over the longer time horizon reviewed here, the boost of the euro's fortunes in its first half-decade appears to be little more than a kind of regression to the mean. After two decades, the general pattern of currency competition is little changed.

Of course, even 20 years is a relatively short period in historical terms. Going back even further would undoubtedly show greater variation in competitive structure. Concentration in the currency system was undoubtedly higher in the first decades after World War II and may well have been lower in the last decades before World War I. But data limitations prevent us from extending detailed analysis back any further than the 1990s.

The important point is the stability of the system *today*. Nothing in our analysis rules out the possibility of greater change in the future. Assuming Europe can get a grip on its current financial crisis, the euro might yet stage an effective challenge to the dollar; China's RMB might eventually take a place commensurate with the size of the Chinese economy; and the currencies of other emerging market economies, such as India or Brazil, might begin to attract international use. Our message is simply that none of this has happened *yet*. Loose talk about the shape of the currency system as it presently exists is misleading and a deterrent to serious analysis. Multipolarity is not (yet) the new normal.

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NOTES

1 As quoted in *IMF Survey*, 22 January 2001, p. 27.
2 See Chen and Peng (2010) and Lee (2010).
3 See Kamps (2006), Goldberg and Tille (2008) and Auboin (2012).
4 The COFER data can be accessed at: http://www.imf.org/external/np/sta/cofer/eng/index.htm.

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