Economic aspects of regional currency areas and the use of foreign currencies

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1. Introduction

In recent years, there has been a significant revival of interest in arrangements that limit a country's freedom to determine its own exchange rate. Writers such as Beddoes (1999) and Rogoff (2002) go so far as to suggest that the world is heading towards just two or three major currency regions in the long term. In any event, the number of distinct and independent currencies probably peaked in the late 1990s.[2] The birth of the euro represents a major change to what Cohen (1998) calls the "geography of money". Other regional currency areas (RCAs) are under consideration and there are prospects of other countries following Ecuador in unilaterally adopting a foreign currency.

The move to form currency areas has accompanied initiatives (or been seen as a means) to strengthen regional integration, and has thus had an important political as well as economic component. The purely economic benefits of a common currency are still subject to intense debate. However, it has been argued that there are good reasons why especially smaller countries exhibit what Calvo and Reinhart (2002) have dubbed a "fear of floating". The postwar Bretton Woods system addressed these concerns with a system of pegged exchange rates, but the system was predicated on the existence of capital controls. As industrial countries removed capital controls, speculative pressures developed that swamped the attempts of governments to defend parities, and the pegged exchange rate system was abandoned in 1973. Despite this, many developing countries retained pegged rates (formally or informally) long after the major economies moved to floating rate regimes. Events in recent years have shown that fixed-but-adjustable pegs in emerging economies are also vulnerable to speculative attacks and may no longer be credible. Currency boards, common currencies, and the unilateral adoption of another currency are sometimes presented as the only viable alternatives to floating, helping to explain the current interest in these policy regimes.[3] This paper discusses the economic issues that arise with such arrangements, as well as some similar issues arising when a foreign currency unofficially supplements the national currency.

Section 2 of this paper examines motives for abandoning an independent national currency, including the various factors considered in the optimum currency areas literature. It also examines how far a common currency fosters the development of local financial markets. Section 3 considers and contrasts three alternative regimes: regional currency areas, currency boards, and the adoption of a foreign currency. (Supporting material is provided in Annexes A, B and C respectively.) A brief conclusion follows.

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[2] This 20th century peak occurred after the establishment of new currencies by the former republics of the USSR and Yugoslavia and before the introduction of the euro. In earlier times there were many more currencies; Einaudi (2002) suggests around 2,000 currencies existed in Europe in the 16th century and Toniolo et al (2003) that in the middle of the 19th century there were over 270 types of legal tender coins just in the Italian peninsula.

[3] However, Masson (2000) and Bubula and Ötker-Robe (2002) do not find strong evidence supporting the elimination of intermediate regimes in favour of the two poles of free floating or hard pegs, as implied by the "hollowing out" hypothesis.

2. Why do sovereign nations forgo an independent currency?

Often the decision to forgo an independent currency has political economy aspects, as mentioned above. The move from a national to a regional currency can help to cement closer political collaboration. This is especially evident in Europe, where the creation of the euro area culminated a 50-year period of policy coordination and the creation of supranational institutions. The creation of a regional currency is also viewed as an important symbol of increasing regional cooperation in Africa, the Middle East and Asia.

Handing over control of monetary policy to a regional or foreign central bank not under the sway of (or at least less influenced by) any individual government may be an indirect way of gaining the benefits of central bank independence. A lack of such independence is often regarded as a prime reason for the poor performance of monetary policies in many emerging economies. Furthermore, the criteria set for joining or remaining in an RCA may prompt more or faster economic reforms. Regional surveillance procedures may apply "peer pressure" on governments to undertake needed structural reforms, in areas where interest groups make change difficult.[4] On the other hand, there is a risk that unilaterally adopting another currency is seen as an *alternative* to harder but more beneficial reforms.

The purely economic case for keeping or rejecting an independent currency and monetary policy is contentious. On the one hand, a partially or completely flexible exchange rate - for all but very small economies - can speed adjustment to changing conditions and can insulate the economy from temporary external shocks (such as commodity price swings, changes in sentiment in international capital markets and so on). Table 1 suggests that floating exchange rates in commodity-exporting countries often tend to reduce the local currency volatility of export prices, relative to their volatility had the country pegged to the US dollar.

Table 1

Floating exchange rate regimes: volatility of export prices[1]

	In domestic currency	In US dollar terms
Australia[2]	6.5	9.4
Canada	4.6	4.1
Chile[2,3]	10.2	18.0
Mexico	4.1	15.0
New Zealand[2]	12.7	9.8
Norway	24.3	11.9
South Africa[2]	12.0	17.2
United Kingdom	4.1	5.9

[1] Standard deviation of monthly unit value indices, seasonally adjusted, over 1995-2002. [2] Quarterly data. [3] 1997-2002.

Source: IMF, *International Financial Statistics*.

On the other hand, the benefits and costs of a common currency in facilitating international transactions, both in trade and capital markets, have long been discussed. This literature is surveyed in Box A. In very open economies, a rigid link to a credible currency should also anchor inflation and inflationary expectations.

[4] Von Hagen and Mundschenk (2002) opine that within the European Union peer pressure has had more effect on large than on smaller countries.

Box A

Currency fluctuations and trade

For many years, the econometric literature struggled to find much effect of currency fluctuations on trade: see Brookes et al (2000) and McKenzie (1999) for surveys. Many articles find the effect insignificant and very few find it large. This is in contrast to survey evidence from firms where they often cite it as a deterrent. This apparent lack of impact is sometimes attributed to the availability of hedging instruments, although Wei (1999) casts some doubt on this. Furthermore, in practice, hedging is generally only effective for short-term exposures; see UK Treasury (2003a). For periods over a year, markets tend to be thinner and more expensive, although they may be gradually filling out: see Goldstein and Turner (2003). Furthermore, firms risk hedging future cash flows that do not eventuate, thereby unwittingly taking on a foreign exchange exposure. Using options rather than futures may avoid this problem but can seem very expensive. Taxation and accounting rules may also make long-term hedging unattractive: see Brookes et al (2000). Hedging is also likely to be harder or more costly for smaller firms.

However, some more recent studies suggest that being in a single currency area is likely to encourage trade (perhaps over and above the elimination of currency fluctuations that a pegged rate would bring). McCallum (1995) finds that, after controlling for other relevant factors, trade between two Canadian provinces is 20 times larger than between a province and a US state. As Canada and the United States are similar culturally, linguistically and economically (notwithstanding some differences in taxes, laws, and to some extent language), a significant proportion of the difference would seem to reflect the different currencies.

Rose (2002), Frankel and Rose (2002) and Rose and Engel (2002) report on studies suggesting two countries with a common currency on average have triple or more the bilateral trade; the effect is much stronger than with just a fixed exchange rate. Of course, this does not imply causality; perhaps countries that trade a lot are more likely to adopt a common currency. Tenreyro and Barro's (2003) study addresses this endogeneity issue but still finds that currency unions strongly increase trade. A time series study by Glick and Rose (2002) finds a smaller but still large effect; in countries leaving currency unions bilateral trade halved. Rose's results have also been questioned as owing too much to very small, and so possibly unrepresentative, economies where there is not only currency union with a large country but also preferential tariffs, legal similarities, etc.[5] Mélitz (2001) finds that correcting for this selection bias lowers the estimated trade effect but leaves it high. Earlier work by Elbadawi (1997) concluded that the two African monetary unions exhibited very different effects on trade, after controlling for the "gravity model" determinants: in West Africa, monetary union seems to have stimulated trade in the early 1980s, but contracted it in the second half of the decade. In Central Africa, effects on trade were basically neutral. Ireland's abandonment of its monetary union with the United Kingdom in 1979 is also an interesting test: it appeared not to have any harmful effects; see Robson and Laidler (2002) and Thom and Walsh (2002). UK Treasury (2003a) report some evidence of higher trade within the euro area since adoption of the single currency.

There is also evidence that in the previous "golden age of globalisation", 1870-1913, countries on the gold standard traded more with each other than with countries not on the standard (after allowing for other relevant factors): see Flandreau and Maurel (2001). López-Córdova and Meissner (2001) report that countries with common currencies had even greater bilateral trade.

The optimum currency areas literature

Discussion of the appropriate geographic area for a common currency goes back at least to John Stuart Mill (1848, p 176). He trenchantly wrote "so much of barbarism, however, still remains in the transactions of most civilised nations that almost all independent countries choose to assert their nationality by having, to their own inconvenience and that of their neighbours, a peculiar currency of their own".

This desire for transactional simplicity, which pushed to its logical conclusion would imply a single currency for the whole world, needs to be put in a macroeconomic context. Mill and most other 19th century economists thought in terms of a world in which prices and wages were completely flexible. In such a world, adjustment to the real exchange rate is possible without any change in the nominal exchange rate.

[5] When Nitsch (2002) and Kenen (2002) adopt what they view as better econometric procedures, they get smaller but still large trade effects from currency union; Persson (2001) gets much smaller, possibly insignificant, effects whereas Pakko and Wall (2001) and Klein (2002) claim there is no impact at all. See also Smith (2002).

In a world of nominal rigidities, however, this simple conclusion does not hold. In this case, transactional simplicity needs to be balanced against the desirability of conducting an independent monetary policy for stabilisation purposes. Analysis of this trade-off led to a large literature on optimum currency areas.

The seminal theoretical work on optimum currency areas was that of Mundell (1961), who emphasised factor mobility: an optimum currency area is an area where factors are highly mobile internally but relatively immobile in moving outside the area. The degree of labour mobility has often entered the policy debate. For instance, it has been noted that labour mobility is much more limited within Europe, indeed even within individual European countries, than in the United States. But promoting labour mobility within the European Union has been an important objective of policy, and has culminated in the right of EU citizens to work in any EU country. Despite poor transport, labour mobility may be rather high within the African RCAs, aided by initiatives such as regional passports: see the paper by Strauss-Kahn in this volume.

The subsequent literature has generally focused on the similarity of shocks and business cycles, trade links or similarities, wage and price flexibility and the extent of risk-sharing, especially through fiscal transfers: see Kang and Wang (2002) and Mongelli (2002) for recent summaries. Annex A includes a summary of the many empirical studies of whether groups of economies form optimum currency areas based on these criteria.

Similarity of shocks and business cycles

Economies subject to similar shocks should want similar monetary policy settings so there should be fewer conflicts arising over the common monetary policy stance. Less often mentioned is the *size* of shocks. If shocks are quite small, it should not matter much if they are not very highly correlated among economies sharing a currency; Table 2 shows this implies western Europe is better suited to a common currency than some other areas. As the paper by Pullicino and Demarco in this volume notes, economies with similar industrial structures or similar trading partners (particularly if the partners are each other) would be likely to experience similar shocks. An alternative view is that it is better for countries with dissimilar business cycles to hold their reserves jointly so that when one country experiences outflows the others experience inflows: see Mundell (1973). This is an argument for the pooling of reserves rather than for a common currency; the two are in principle separable.

Looking at output correlations is a useful first step in thinking about optimum currency arrangements.[6] The highest output correlation in Table 2 is not between any countries sharing a currency, but between Canada and the United States. The small western European economies in the euro area are also significantly correlated with western Europe as a whole. The Latin American countries are correlated among themselves but not with the rest of the world. The same is true for the Gulf economies. There are also some reasonably high correlations within Asia, but these are probably resulting from essentially one observation; the 1997-98 crisis. The African countries tend to have idiosyncratic shocks and show low correlations both with other regions and with each other.

As well as differences in shocks, there are differences in how monetary policy affects the real economy. Factors such as extent of home (and direct equity and government bond) ownership; the extent to which it is funded by floating rather than fixed rate loans; the amount of consumer indebtedness; the dominance of, and competitiveness within, the domestic banking system; and the development of the corporate bond market may all alter the response of economies to interest rate fluctuations. If these differences are large, even if countries using the same currency face similar output gaps, they may initially require different interest rate adjustments to remove them. However, as the paper by Strauss-Kahn in this volume points out, the formation of an RCA may itself alter these factors.

[6] In similar calculations by UK Treasury (2003b) for eight regions in the United States, over two thirds of the correlations were over 0.5. This provides one possible benchmark for assessing the results in Table 2.

Table 2

Output correlations and volatility, 1976-2001

	Correlation of annual growth in real GDP with					Volatility[1]
	Western Europe	United States	Japan	Other Asia	Latin America	
Hong Kong SAR	–0.06	0.27	0.47	–0.24	0.53	4.1
Indonesia	–0.28	–0.04	0.51	0.02	0.31	3.1
Korea	0.05	0.27	0.48	–0.05	–0.10	3.7
Malaysia	–0.24	0.03	0.40	–0.13	0.19	3.1
Singapore	–0.12	0.11	0.31	–0.02	0.17	3.1
Thailand	–0.34	0.03	0.65	0.04	0.03	2.4
Argentina	–0.27	0.06	–0.23	0.13	0.43	6.2
Brazil	0.07	0.23	0.12	–0.01	0.78	3.6
Mexico	0.21	0.11	0.22	–0.27	0.54	3.4
Peru	0.14	0.04	–0.29	0.13	0.58	5.3
Saudi Arabia	0.48	0.16	0.32	–0.52	0.49	4.8
Botswana	0.62	0.25	0.56	–0.28	0.06	5.1
Cameroon	0.51	0.11	–0.04	–0.09	0.04	3.3
Ghana	–0.54	0.33	–0.07	0.53	0.05	2.4
Nigeria	–0.17	–0.09	0.24	–0.20	0.25	5.2
South Africa	0.42	0.16	0.14	–0.10	0.34	2.2
Small western Europeans[2]	0.76	0.20	0.31	–0.39	0.23	0.9
Canada	0.69	0.83	0.06	0.12	0.31	2.1

[1] Average absolute change of annual percentage changes in real GDP. [2] Simple average of correlations for Austria, Belgium, the Netherlands and Portugal.

Sources: BIS estimates, based mostly on Maddison (2001) and IMF, *World Economic Outlook*.

Trade patterns

The higher the levels of trade between countries, the more closely output movements are likely to be correlated. Similar patterns of trade with third parties or a similar industrial composition of trade can have a comparable effect. Such similarities make it more likely that a shock to one country will lead to, or occur simultaneously with, a shock to the others. Trade patterns are summarised in Table 3.[7] It is rare for countries to have as large a share of their trade with a (potential) anchor currency as do the euro area members with each other.

[7] The proportions of trade with the euro area and the United States shown in Table 3 are lower than the proportion of trade with countries using their currency or stable against it. For example, if the euro-using area is defined to also include Estonia and Lithuania, then the share of Latvia's exports to it rises from 31% to 44%.

Table 3

Destination of exports (origin of imports) as percentage of total; 2002

	Euro area		USA		Japan		Other Asia		Africa		Middle East	
Bosnia and Herzegovina	**64**	**(41)**	2	(1)	0	(0)	0	(0)	1	(0)	2	(0)
Bulgaria	**52**	**(46)**	5	(2)	0	(1)	1	(5)	1	(0)	3	(1)
Croatia	50	(52)	2	(3)	1	(1)	0	(5)	4	(1)	1	(2)
Latvia	28	(42)	7	(2)	1	(0)	2	(3)	1	(0)	1	(0)
Malta	30	(48)	12	(5)	2	(5)	31	(22)	1	(0)	3	(2)
Ukraine	22	(25)	3	(1)	1	(0)	13	(6)	5	(0)	6	(0)
Argentina	17	(14)	11	(12)	1	(1)	11	(7)	3	(2)	5	(1)
Bolivia	5	(8)	11	(13)	3	(2)	2	(3)	0	(0)	0	(0)
Brazil	19	(22)	24	(23)	4	(3)	10	(11)	3	(7)	4	(3)
Ecuador	17	(14)	**39**	**(28)**	3	(6)	6	(10)	0	(1)	0	(1)
El Salvador	3	(9)	**63**	**(39)**	0	(2)	1	(7)	0	(0)	0	(0)
Mexico	3	(9)	83	(69)	1	(3)	2	(10)	0	(0)	0	(0)
Panama	15	(5)	**48**	**(34)**	1	(5)	2	(5)	0	(0)	0	(0)
Ghana	42	(24)	7	(7)	4	(2)	5	(16)	11	(34)	0	(1)
Nigeria	25	(32)	34	(9)	4	(2)	10	(30)	12	(4)	0	(1)
South Africa	27	(34)	13	(10)	9	(6)	12	(13)	15	(3)	3	(13)
Bahrain	3	(18)	**5**	**(12)**	2	(7)	10	(13)	4	(1)	6	(36)
Qatar	3	(39)	**4**	**(9)**	40	(10)	33	(13)	1	(0)	6	(13)
Saudi Arabia	14	(25)	**19**	**(11)**	16	(9)	33	(25)	5	(3)	8	(5)
United Arab Emirates	4	(23)	**2**	**(8)**	28	(7)	32	(35)	2	(1)	10	(11)
Hong Kong SAR	9	(7)	**19**	**(7)**	5	(13)	49	(65)	1	(0)	2	(1)
Korea	10	(9)	20	(15)	9	(20)	38	(28)	2	(1)	4	(14)
Malaysia	10	(8)	**21**	**(15)**	11	(17)	47	(48)	1	(0)	2	(2)
Belgium	**61**	**(61)**	8	(6)	1	(3)	5	(7)	2	(3)	3	(2)
France	**49**	**(56)**	8	(7)	2	(2)	5	(6)	5	(4)	4	(2)
Canada	3	(8)	88	(63)	2	(4)	3	(10)	0	(1)	0	(1)

Note: Area to which currency is fixed (if any) is shown in bold.

Source: IMF, *Direction of Trade Statistics*, June 2003.

However, some central European countries come close, and for them the euro is an obvious anchor. The situation in the Americas is less clear. The United States accounts for a large proportion of trade in Ecuador and El Salvador, which have recently adopted the dollar, but for an even larger share in Canada and Mexico, which prefer to float. Despite its extensive use of the US dollar, Argentina trades more with the European Union than with the United States, as does Brazil. The European Union is the largest trading partner for most African and Middle Eastern countries. Asian trade is more diverse, with intraregional trade quite important. Hong Kong SAR's trade with the US is relatively small but its link to the dollar also stabilises its exchange rate with mainland China, its dominant trading partner. It is rare for Japan to be a dominant trading partner (other than buying a lot of oil from Qatar) so it may not be surprising that no country uses the yen as an anchor. The "gravity model" of trade, which does quite well at explaining trade patterns, implies that trade between two economies is proportional to the product of their GDPs: see Rose (2002). This implies that small poor economies will not trade much with each other, and helps explain why there is relatively little trade within the African and eastern Caribbean RCAs.

The terms of trade are also relevant to the choice of exchange rate regime. Based on this criterion, it would not be desirable for Canada to adopt the US dollar despite its large trade with the United States as Canada is a commodity-exporter while the United States is a commodity importer. Table 4 provides some data on correlations between economies' terms of trade. It suggests the Gulf States would be well suited to forming an RCA between themselves but it is not obvious they should link to either the dollar or the euro. Argentina, Bolivia, Brazil and Ecuador all face similar terms of trade fluctuations, but these are nothing like those experienced by the United States. No country has terms of trade moving closely with those of Japan, providing another reason why there is no yen bloc.

Table 4

Correlation[1] of terms of trade with those of:

Countries		Euro area	USA	Japan	Other	
Argentina	(Float)[2]	–0.5	–0.5	–0.4	0.5	(Brazil)
Bolivia	(Peg)	–0.1	0.0	–0.0	0.6	(Brazil)
Brazil	(Float)	0.3	0.2	–0.1	0.5	(Argentina)
Ecuador	(OU)	–0.8	**–0.9**	–0.5	–0.3	(Brazil)
El Salvador	(OU)	0.7	**0.7**	0.2	–0.6	(Mexico)
Mexico	(Float)	–0.7	–0.8	–0.1	–0.2	(Brazil)
Panama	(OU)	0.3	**0.4**	–0.7	–0.7	(Mexico)
South Africa	(Float)	0.6	0.5	0.2		
Kuwait	(Peg)	–0.9	**–1.0**	–0.3	1.0	(Saudi Arabia)
Qatar	(Peg)	–0.9	**–0.9**	–0.4	0.9	(Saudi Arabia)
Saudi Arabia	(Peg)	–0.9	**–0.9**	–0.4		
UAE	(Peg)	–0.9	**–0.9**	–0.4	1.0	(Saudi Arabia)
Hong Kong	(CyB)	0.2	**0.4**	–0.6	0.8	(China)
Korea	(Float)	0.6	0.5	0.6	–0.3	(China)
Malaysia	(Peg)	–0.1	**0.0**	–0.8	0.3	(China)
Belgium	(RCA)	**0.8**	0.7	0.3	–0.2	(Switzerland)
France	(RCA)	**0.7**	0.6	0.6	–0.3	(Switzerland)
Canada	(Float)	–0.8	–0.9	–0.3	0.5	(Australia)
Australia	(Float)	–0.8	–0.4	–0.6	–0.7	(Korea)
New Zealand	(Float)	–0.4	–0.1	0.0	0.5	(Australia)

Note: Area to which currency is fixed (if any) is shown in bold. OU: Official use of another currency. CyB: Currency board.

[1] Calculated over the period 1995-2002. [2] Currency board until early 2002.

Sources: Datastream; national sources.

Firms inside an RCA can obviously invoice in their (common) domestic currency when trading with other members of the RCA. But by being part of a larger currency area, they are more able to invoice in the domestic currency when exporting to (and to a lesser extent, importing from) other countries too. This reduces the risk facing exporters, another benefit of a common currency.

Fiscal transfers

Fiscal transfers across countries in an RCA could cushion them from asymmetric shocks. Income transfers from countries less affected by a particular shock could make up for losses of income and help keep labour and capital employed. There is much less scope for this within most RCAs, such as the euro area, than within federations such as the United States or Canada: see Bayoumi and Masson (1995). In particular, transfers across countries within Europe (which are in any case small) do not explicitly aim to provide offsets for differential shocks. In assessing the extent of fiscal transfers, it is necessary to distinguish the stabilisation (transfers in different directions in different years) and redistributive (transfers in similar directions over time) roles of fiscal policy. Redistribution seems less essential for the success of a monetary union than stabilisation, and the latter can in principle be performed by national governments.

Since monetary policy is unable to respond to shocks hitting individual members, a monetary union may require greater national fiscal flexibility. But this may conflict with fiscal rules. In the past, EU countries seem to have been as successful in using national fiscal policies to carry out stabilisation as their (subnational) North American counterparts; see Bayoumi and Masson (1995). But the ultimate effect of the Stability and Growth Pact on fiscal flexibility in the euro area is still a matter of some debate.

Other considerations

Several other factors with a bearing on optimum currency areas are worth noting. It is often argued that it would be easier for countries sharing a currency to agree on goals (such as inflation targets; see below) if they are similar in their stages of development.[8] In most RCAs, per capita GDP in the richest country has exceeded that in the poorest by at most a factor of three. This would not be the case with some proposed RCAs, particularly in Asia (Table 5). It has also not been the case with the adoption of foreign currencies; because small poor economies would not gain much advantage from adopting the currency of another undeveloped country, they tend to adopt an international currency issued by a major industrial country. The paper by Foulo in this volume for instance argues that it is desirable for the link currency itself to be relatively stable against third currencies. Finally, if the different national currencies are already circulating within countries contemplating union, this will facilitate the introduction of a single currency. This was the case with the Scandinavian Currency Union. Euros are circulating in some of the countries aspiring to join the euro area and dollars are widely used in Latin America.

A final point to highlight from the optimum currency area literature is that the criteria are to some extent endogenous. Joining an RCA or adopting a foreign currency may itself alter the characteristics of an economy, a point made in Mundell's original article. For instance, it is likely to increase trade with countries using that currency, and so increase the correlation between their economic performances.[9] For example, UK Treasury (2003b) finds some evidence of increased correlation between regions of the United States. In this way a country that appears to fail optimum currency area criteria before joining may satisfy them once it is inside. Such endogeneity has some bearing on the debate between those arguing that economies should meet convergence criteria before joining an RCA and those who argue this is less important as convergence will follow from joining: see Mundell (1993).

Development of financial markets

The creation of an RCA may spur the development of local financial markets. The paper by Al-Jasser and Al-Hamidy in this volume cites as a benefit of forming an RCA among GCC countries that it is expected to integrate and deepen financial markets. Yam (1999) commented that, as a long-term

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[8] It would also make it easier to agree on practical aspects such as the denomination at which coins give way to notes.

[9] A possible counterargument presented by Krugman (1991) is that forming an RCA may lead countries to specialise more in particular industries, making them more vulnerable to idiosyncratic shocks and so less like an optimum currency area. The greater geographic concentration of industry in the United States than in Europe is cited in support. Rose and Engel (2002) find that after controlling for size, members of currency unions are no more specialised than those economies with their own currencies. However, Tenreyro and Barro (2003) find that currency unions decrease the co-movement of output, providing support for the specialisation hypothesis.

possibility, an RCA in Asia "would create larger and more liquid markets that are less susceptible to manipulation". The Eastern Caribbean Central Bank aspires to create a "single financial space" within the region. In principle, a currency area could help overcome some of the disadvantages to countries in having "small" financial systems: see Bossone and Lee (2002). The capital market for the RCA could be larger and more liquid than in the individual country. There could be greater opportunities for banks to exploit economies of scale.

How significant such gains are in practice is open to doubt, unless a common currency is also accompanied by other initiatives. It is true that entering an RCA might be expected to lead to banks with a more geographically and industrially diversified portfolio. However, the development of an integrated banking system depends on many factors other than the use of a common currency. For instance, van Beek et al (2000) find that domestic financial institutions in the Eastern Caribbean Currency Union often restrict their activities to their home country. This tendency is reinforced by restrictions on foreign ownership (even by companies from other member countries), different tax arrangements for non-members and prohibitions on residents' purchase of foreign currency securities or real estate abroad. Even in Europe, few of the bank mergers since currency union have been cross-border. In Africa, neither of the long-standing RCAs are very financially integrated: interbank markets are rudimentary and money transfers across borders take a long time. Indeed, Monga and Tchatchouang (1996) criticise the monetary union, and in particular the peg to the French franc, for having delayed financial development within these RCAs (by in effect routing transactions through Paris). The evidence for this is not straightforward: see the paper by Strauss-Kahn in this volume. Notably, the level of financial development of the members seems to be comparable to that of their neighbours.

Similar considerations apply in the creation of deeper and more integrated capital markets. Larger markets tend to be more liquid and to attract foreign investors. A larger financial market will have more scope for specialised financial institutions. It also allows institutions to diversify credit risk without incurring foreign exchange risk. But a common currency by itself is no guarantee that such markets will develop. Divergent market practices, different legal, tax and regulatory regimes, capital controls and some countries' wish to foster "their" financial market can all stand in the way of the necessary convergence. For example, the western African countries have a regional stock exchange, but in fact few companies are listed and transactions are few. The central African countries have a project to establish a regional stock market in Libreville, Gabon, but the Cameroonian authorities, with the region's largest economy, have chosen to proceed with their own stock exchange, in Douala. Given the small number of actual and potential transactions, competition between the two exchanges is likely to hinder the establishment of a true regional financial market.

Even Europe, which has made enormous progress, is still actively engaged in developing standard contracts and a more homogeneous trading structure. This was not created overnight along with the creation of a common currency. The Lamfalussy Group has examined ways of moving towards a more integrated financial market within the euro area. The advent of the euro appears to have led investors in fixed income markets to focus more on the characteristics of individual borrowers than the nationality of the issuer: see Barth et al (2002), Galati and Tsatsaronis (2001) and McCauley and White (1997). Similarly, prices in European equity markets increasingly reflect risk factors specific to industrial sectors rather than individual countries. Borrowers have benefited from easier access to a larger investor base. Stockmarkets have become more concentrated (for example, in the context of Euronext). But markets to some extent remain segmented because of national differences. For example, diverging market practices, arising partly from differing legal and taxation frameworks, are impeding development of pan-European collateral arrangements in money markets. Rivalries and regulatory incompatibilities continue to impede creation of a pan-European equity trading platform.

A final note of caution is that the adoption of a common currency (linked, for example, to the dollar) will not necessarily mean that domestic interest rates fall to common currency (eg dollar) levels. While a firm commitment to use another currency, or fix rigidly to it, would virtually eliminate currency risk, it would not eliminate national credit risk. Credit risk premia appeared to fall in western Europe following the advent of the euro, and this might be expected elsewhere. One reason is less risk of a large devaluation forcing default on entities with currency mismatches. Credit risk premia could also fall if it were thought that other members of an RCA would provide support to prevent a default. However, it is possible that credit risk might even increase, as the country would no longer have the option of preventing default by issuing its own money.

Table 5

Ratio of highest to lowest per capita incomes

RCA	Year	(Highest/lowest members)	
Regional currency areas			
Scandinavian Currency Union	1870	(Denmark/Norway)	1.4
Scandinavian Currency Union	1913	(Denmark/Norway)	1.6
Latin Monetary Union[1]	1870	(Belgium/Greece)	3.0
Latin Monetary Union[1]	1913	(Switzerland/Greece)	2.7
Central Africa	1950	(Gabon/Chad)	6.2
Central Africa	2002	(Equatorial Guinea/Chad)	5.6
West Africa	1950	(Benin/Mali)	2.2
West Africa	2002	(Senegal/Guinea-Bissau)	2.0
Eastern Caribbean	2002	(Antigua and Barbuda/Dominica)	2.1
Euro area	2002	(Austria[2]/Portugal)	1.5
Hypothetical regional currency areas			
Expanded euro area	2002	(Austria[2]/Romania and Turkey)	4.5
North America	2002	(USA/Mexico)	4.1
Mercosur four	2002	(Uruguay/Paraguay)	2.7
Arabian Gulf	2001	(Qatar/Oman)	3.3[3]
Andean Community	2002	(Colombia/Bolivia)	2.6
Caribbean (CARICOM)	2002	(Bahamas/Haiti)	10.1
East Africa	2002	(Uganda/Tanzania)	2.4
West Africa (ECOWAS)	2002	(Ghana/Sierra Leone)	4.1
Southeast Asia[4]	2002	(Malaysia/Indonesia)	2.8
ASEAN[5]	2002	(Singapore/Cambodia)	14.5
East Asia[6]	2002	(Hong Kong SAR/Indonesia)	9.0
Currency boards			
Linked to euro	2002	(euro area/Bosnia and Herzegovina)	4.3
Linked to US dollar	2002	(United States/Djibouti)	16.9
Linked to rand	2002	(South Africa/Lesotho)	3.6
Official use of foreign currencies			
Users of US dollar[7]	2002	(United States/Ecuador)	11.2

[1] Data are not available for Bulgaria. [2] Strictly speaking, the highest income is in the very small member state of Luxembourg, whose average income is 2.9 times that of Portugal and 8.1 times that of Bulgaria. [3] Not on a PPP basis. [4] Indonesia, Malaysia, the Philippines and Thailand. [5] Data are not available for Brunei and Myanmar. [6] China, Hong Kong SAR, Indonesia, Korea, Malaysia, the Philippines, Singapore and Thailand. [7] Data are not available for East Timor.

Sources: Mostly based on data in Maddison (2001), van Beek et al (2000) and World Bank.

3. Choosing between different rigid currency regimes

Countries that give up an independent currency choose from broadly three types of policy:

- ***Regional currency area***. There have been only a few cases of *independent* countries forming an RCA, or retaining one after gaining independence. (The adoption of a common currency has mostly resulted from political integration such as the unification of Italy in the 1860s and the adoption of the constitution in the United States in 1789.) The most prominent RCA is the euro area; other current examples are the two CFA zones in Africa and the Eastern Caribbean Currency Area. Previous examples included the Latin Monetary Union and the Scandinavian Currency Union before the First World War. Annex A discusses these RCAs and the characteristics of their members. A number of governments in Africa and the Middle East have announced plans to form regional currency areas and the idea has also been discussed in other parts of the world; these are also described in Annex A.
- ***Currency board.*** This idea enjoyed something of a revival in the 1980s and 1990s with the (re-)adoption of a currency board by Hong Kong (in 1983) and Argentina (1991) and subsequently by four eastern European countries (see Tables 7 and 8).
- ***Official use of a foreign currency.*** There have been many cases where a small country (unilaterally) adopted the currency of a larger country, usually the US dollar or the euro, for its own use. Most examples are very small open countries, such as Kiribati and Nauru (see Table 9). More recently some medium-sized economies such as Ecuador and El Salvador have adopted the US dollar and the idea has been seriously discussed for larger economies such as Argentina.

Although the choice between these options will be influenced by economic issues (for example the desirability or otherwise of retaining a degree of monetary independence), it often turns on political considerations. For example, RCAs are often part of regional integration initiatives with the creation of a regional monetary agency part of a process of building area-wide institutions. Often it is a matter of relative sizes; similar sized economies such as France and Germany are more likely to create a new regional currency issued by a supranational central bank, but a very large economy is unlikely to modify its currency arrangements to suit a very small economy. This can lead small economies to use currency boards or unilaterally adopt another currency. Of these two options, generally only currency boards allow the retention of seigniorage.[10] However, unless currency crises are very infrequent, the cost of lost seigniorage (see Annex C) is much less than the expected costs of currency crises. Simply adopting another currency solves the problem of monetary policy credibility by eliminating the need for a central bank. Bulgaria, Estonia and Lithuania are using a currency board as an interim measure in the transition to an RCA although other countries in the same position are floating or pegging: see the paper by Hristov and Zaimov in this volume and European Central Bank (2002).

In some countries (see Table 10), lack of confidence in the domestic currency has led to an ***unofficial use of foreign currencies***, often referred to as "currency substitution" or "de facto dollarisation". Throughout history the currency of a major power has been used widely outside its borders when that currency has a reputation for holding its value.[11] Its use is particularly likely where the domestic

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[10] It may be possible to persuade the issuing central bank to share seigniorage with countries adopting the currency. South Africa shares seigniorage with the other rand-using countries; see Bogetić (2000) and the paper by van Zyl in this volume. US Treasury Secretary Larry Summers testified in 1999 that it would not be appropriate for the US authorities "to provide access to the Federal Reserve Discount Window, or adjust bank supervisory responsibilities or the procedures or orientation of US monetary policy in light of another country deciding to adopt the dollar" (cited in Kenen (2000)). This stance, sometimes called the "three no's", has been reiterated by other US officials (see eg the comments by Truman on page 154 of this volume), including those from the Federal Reserve. But Summers did not rule out sharing seigniorage. A bill put before the US Senate in early 2000 by Senator Mack would have provided for this, but despite being approved by the Senate Banking Committee it did not progress further. See the paper by Howard in this volume, Mack (2000) and Schuler (2000).

[11] The Athenian "owls" circulated widely during the fourth century BC. The Emperor Constantine introduced the solidus, which was in wide use from England to India until Byzantium fell to the crusaders in 1204. The Muslim dinar was also used in many countries from around 700 to 1000 AD. The florin of Florence, ducato of Venice and Spanish "pieces of eight" were widely used in the middle ages. The Dutch trading empire saw its silver liondaler circulate widely in the 17th century. Following Britain's lead in the industrial revolution, the pound became a leading international currency and in the 20th century its role was taken over by the US dollar. See Dwyer and Lothian (2002) and Einaudi (2002).

currency has a poor history, such as in much of eastern Europe and Latin America. The authorities may acquiesce in this process, encourage it by giving the foreign currency "legal tender" status, or discourage it to various degrees.

Regional currency areas

Nominal anchor for monetary policy

A new common currency can either float or be fixed against a major international currency. The advantage of a floating currency is that it allows a degree of flexibility in dealing with, for example, cyclical divergence between the RCA and the rest of the world. At present, the only floating regional currency issued by a supranational central bank is the euro.[12]

An RCA with a floating exchange rate has to choose a policy anchor. As the act of forming an RCA is likely to alter the demand for money, relying solely on a monetary aggregate is unlikely to be desirable, at least initially. More plausible is a (formal or informal) inflation target. Choosing an inflation target is easier if the RCA members are at similar stages of development, have well developed financial markets (permitting the effective use of indirect monetary policy instruments) and have harmonised inflation indices,[13] as in the euro area. Choosing an inflation target for an RCA that contained both advanced and rapidly growing developing countries would be more difficult because relative prices are changing more sharply, given the Balassa-Samuelson effect (the tendency for the relative price of services to rise more quickly in poorer fast-growing economies). See Table 5 for examples of where this could prove a problem.

If the decision is made to fix the new currency, then an anchor currency or basket of currencies must be selected. Choosing a basket of currencies corresponding to trade weights would stabilise the nominal effective exchange rate. Although this has a strong appeal (it would prevent essentially arbitrary changes in the effective exchange rate due to changes in the cross rates of major currencies), there are powerful counterarguments. One is that the public grasp the idea of a link with a single currency more easily than a link to some more abstract weighted average. Nevertheless, it has been suggested that Asian developing economies peg to a common basket of dollar, yen and euro, perhaps as an interim measure towards a common Asian currency: see for example Ito and Ogawa (2000) and Kim and Ryou (2001).

Most regional currency areas have tied themselves to a single major currency. This choice depends in part on trade flows, but is also influenced by the current dominance of the dollar in international trade, finance, and in the pricing of commodities. The Gulf States introduced as a transition measure a requirement that all members peg to the dollar within agreed margins. The paper by Al-Jasser and Al-Hamidy in this volume explains that the dollar was chosen because it is the intervention currency, reserves are mostly held in dollars and the existing currencies have been (more or less) pegged to the dollar. Yet, as the Gulf States trade more with the euro area than with the United States, they could have instead chosen to gradually shift their reserves into euros. No decision has yet been made about whether the new Gulf currency will float or be fixed.

There are different ways by which the regional monetary authority could maintain a fixed link with a major currency. One option is simply to give it the mandate (and the reserves!) to do so. The problem with this, however, is that such a new authority could lack credibility and, in the presence of high capital mobility, the link could be the object of speculative attacks. To address this, the regional monetary authority in the eastern Caribbean operates like a currency board. In the CFA franc zones, it is the French Treasury that ultimately guarantees the peg to the euro by allowing in principle unlimited overdrafts. Moreover, the arrangement triggers policy measures by the central bank and member countries if the central bank's reserves fall below 20% of its sight liabilities, providing an extra guarantee.

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[12] The rand has a regional role in the Common Monetary Area, but is issued by South Africa's central bank, and responsibility for monetary policy is not shared with the other (much smaller) countries of the CMA.

[13] Asante and Walton (2002) discuss the process of harmonising statistics in the proposed West African currency union.

Need for policy discipline

Some of the expectations about what the adoption of a common currency can achieve may be unrealistic. For example, Table 5 shows it has not led to convergence in per capita incomes within the RCAs. A more general risk is that countries may become complacent about the external constraint - they may expect capital inflows to increase permanently. The nature of the external constraint may change with the adoption of a common currency, but it does not disappear. Countries that adopt an ambitious exchange rate target (for example, pegging to the euro) need to be quite sure that they can implement the macroeconomic stabilisation policies such ambitious targets require. If they are not able to do so, they may be led to impose payments restrictions in order to defend the exchange rate regime. In the past, many countries sought to defend exchange rate pegs by introducing (or tightening) restrictions on currency convertibility and rationing foreign exchange. These restrictions impede trade, distort prices, and encourage parallel currency markets. In the context of a single currency with limits on central bank financing, governments may find themselves unable to limit spending to match available financing, and be forced instead to incur arrears to employees, suppliers, and creditors. Arrears also have a corrosive effect on the economy's efficiency.

Rules for joining and belonging to a regional currency area

Countries admitted to an RCA have to meet some rules. For example, rules may be needed to limit the actions of any local central bank that remains operational. In particular, any monetary financing of fiscal deficits should be limited, although this is not always respected. In the existing monetary unions in Africa (the CFA zones), for instance, monetary financing of deficits is not prohibited, but is limited by statute to 20% of a country's previous year's fiscal revenues. In practice the ceilings have been occasionally breached, and the ceilings were also generous enough to allow several of the larger countries to accumulate excessive indebtedness. In the late 1980s and early 1990s, governments managed to obtain central bank credit indirectly through borrowing from commercial banks that were under their control, which then refinanced themselves at the central bank: see Stasavage (1997). Both zones have approved in principle reforms that would prevent their central banks from any direct financing of government deficits, as in the euro area, but the timetable for their introduction is uncertain. The reforms need to be accompanied by the development of alternative financing sources for governments (in particular, regional bond and treasury bill markets), and involve regulatory and institutional changes.

Other rules relate to macroeconomic performance. For instance, countries are often required to meet "convergence criteria", both as an initial qualification for joining and as an ongoing membership rule.[14] There are several general reasons for such requirements. Meeting such criteria demonstrates the firmness of a country's commitment and establishes initial conditions that are less likely to produce problems should negative shocks subsequently occur: see Masson (1996). Further, the ability to satisfy convergence criteria is an indication that the political commitment may be durable. In addition, the more similar the countries' initial macroeconomic situations, the less likely are their interests to subsequently diverge. The rules sometimes cover inflation; both the current inflation rate and the extent to which markets believe inflation will continue to be kept under control in the future. The latter is captured by setting criteria referring to long-term bond yields and exchange rates; if markets believe inflation is only temporarily low, bond yields will stay high and the exchange rate may well weaken.

Criteria that are based on the ability to keep a country's exchange rate within margins can easily be justified as a training ground for the monetary union's permanently fixed parities. If countries are not flexible or committed enough to maintain these parities, this throws doubt on their ability to adapt to a common monetary policy. In Europe, the ERM served this role, but free capital movements and the attempt to maintain narrow margins while ruling out realignments, even when convergence of inflation and commitment to monetary union had not yet been demonstrated, led to the crises of 1992-93. With wider margins (plus or minus 15%), the system proved robust, and a similar system is to be applied to the EU accession countries, in the form of the ERM II. In Africa, the WAMI is helping put in place an

[14] These should be measured using consistent definitions; Eurostat has played an important role in producing independent and harmonised data for the euro area.

exchange rate mechanism that will require countries entering the monetary union to keep their currencies within 15% of central parities calculated relative to the US dollar.

Fiscal rules are among the most important and controversial criteria. One view is that no fiscal rule is needed other than the prohibition of the monetary financing of deficits. Countries within an RCA that run large fiscal deficits will thus be forced to issue bonds. The knowledge that such borrowing will increase debt servicing costs and may well lower their sovereign credit ratings will be a strong deterrent to large deficits. Market discipline can work even within an RCA - provided there are no bailouts. The counterview to this, however, is that a lack of market discipline in one country may harm other members. Such deficits and debt servicing burdens could put pressure on the central bank to lower interest rates and could reduce the resistance to inflation (as inflation lowers the real value of nominal debts). The credibility of the RCA's central bank would be undermined, and all would suffer from higher interest rates.

It is probably fair to argue that this counterview has prevailed in the policy debate. Most RCAs have incorporated various forms of fiscal criteria (see Table 6). But there has been much debate about the precise specification of such rules. Among the more important issues that have been raised are:

- *Is there a need for a rule on **both** deficits **and** debt?* Some have argued that a rule on the level of the debt/GDP ratio is most appropriate, allowing countries to decide within that ceiling when to run fiscal deficits. But deficit limits may be useful in slowing the growth of debt before the debt limit is reached.
- *Should the ceiling for deficits vary with the cycle?* There is a good logical case for fixing criteria in terms of cyclically-adjusted deficits but this would require an accepted authority to calculate such a measure. An alternative way of introducing some fiscal flexibility would be to suspend the rules in the event of a large recession (as in the euro area), or apply limits to the *average* deficit over the business cycle. But there are trade-offs between flexibility and the credibility that comes from simpler rules.
- *Should distinctions be drawn between different categories of public expenditure?* It has been variously argued that public infrastructure investment, or education, or defence spending should not be limited by the rules in the Stability and Growth Pact of the euro area. In the two CFA franc zones, the fiscal deficit measure selected excludes grants and foreign-financed public investment expenditure. This is to avoid grant revenues, which tend to be outside the control of the host country and may be temporary, leading to an unduly rosy picture of the deficit, and because these grants are often linked to particular social or infrastructure spending.

Given the inevitability of doubts about any specific fiscal rules, very rigid enforcement may not prove practicable. Yet limits of some kind are probably needed if an RCA is to be credible with the markets. Enforcing such limits is likely to present a delicate political challenge. The European Union has gone furthest in establishing sanctions on governments that do not respect the ceiling on fiscal deficits: see Von Hagen and Mundschenk (2002). The Stability and Growth Pact allows for a gradation of sanctions leading to the imposition of fines on governments for excessive deficits. How far these provisions would "bite" if a major country were significantly to overshoot the targets remains to be seen. Sanctions in the CFA franc zones have yet to be applied, but could include denial of access to financing by the central bank or regional development bank. It may in any case be difficult ex post to enforce monetary sanctions that in principle were agreed ex ante, because it would be politically unpalatable to make countries already facing fiscal deficits pay large fines. More credible might be the suspension of participation in the decision-making bodies of the RCA: see Masson and Pattillo (2002).

The operation of modern day currency boards

With a currency board, all currency is automatically guaranteed to be fully backed by a reserve currency at a fixed rate and the monetary authorities are obliged to redeem their liabilities at this rate. The potential for arbitrage generally limits any divergence from this rate in transactions throughout the economy. Such full backing should remove any incentive for a "run" from the currency. If the bulk of transactions balances are held with banks, however, a simple focus on currency is less relevant.

Table 6

Convergence criteria in regional currency areas

	Inflation	Fiscal criteria (% to GDP)			Other
		Deficit	Debt	Govt revenue	
Current RCAs					
Euro area *entry*	<1.5% above lowest 3	<3%	<60%		Participation in ERM II without tension for at least two years. Long-term bond yields within 2% of the average of those in the three economies with lowest inflation
ongoing		<3%[1]			
West Africa (WAEMU)	<3%	0[2]	<70%	>17%	No payment arrears, current account deficit <3% of GDP; public wage bill no more than 35% of revenues
Central Africa (CAEMC)	<3%	0[2]	<70%	>17%	No payment arrears, current account deficit <3% of GDP; public wage bill no more than 35% of revenues
Proposed RCAs					
West Africa (ECOWAS)	<5%	<4%			Reserves > 6 months' imports, no payment arrears, central bank financing limited to 10% of tax revenues[3]
Arabian Gulf (GCC)	To be set	To be set			
Andean Community	<10%	<4%	<50%		
Caribbean (CARICOM)					Steady exchange rate for 3 years, foreign reserves> 3 months' imports, external debt service/ exports <15%

[1] With structural component in balance. [2] Excluding grants and externally financed investment. [3] See page 149 of this volume for a full list of secondary criteria.

Currency boards were very common in colonial administrations, but became less popular after World War II. Many newly independent countries were keen to have central banks and independent currencies to symbolise their nationhood in the same way as a flag or a seat at the UN. It also reflected a prevailing view that currency boards inhibited national development by directing savings abroad and preventing "fine-tuning" of macroeconomic policies. Some governments hoped central banks could provide "cheaper" means of funding expenditure, or a less politically visible means than taxation. The paper by Ojo in this volume cites "the scarcity of foreign exchange, the need to finance priority projects and make room for some growth" as reasons why the proposed second monetary zone in western African has eschewed a currency board.

Currency boards had a revival in the 1990s as having a stable monetary anchor became regarded as more important than being able to use monetary policy for counter cyclical policy. Currency boards were viewed as a good way of obtaining stability in some transition economies with little experience of central banking and little confidence in institutions: the paper by Kovačević in this volume, for example, refers to the triple transition Bosnia and Herzegovina were facing; from war to peace, from command-economy to free market and from province to independent country. There has been discussion about introducing currency boards in eastern Europe, Iraq, Kazakhstan, the Kyrgyz Republic, Liberia, Palestine and Somalia, and they had been considered in Ecuador, El Salvador and East Timor before it was decided to adopt the US dollar. Some writers have even recommended the system for large economies such as Brazil, Indonesia, Mexico, Russia and Ukraine.

Table 7

Currency boards

	Year adopted	Anchor currency	Population[1] in '000 persons	Real GNI $ bn[1,2]	Imports as a % of GNI[1]	Imports: % from anchor country[1]	Issuer	Sole legal tender
Bahamas	1916	US dollar	314	5		24	CB	
Bermuda	1915	US dollar	60	2		11[3]	MA	
Bosnia & Herzegovina	1997	Euro[4]	4,121	24		41	CB	Yes
Brunei	1967	Singapore $	351	7		31	CyB	No
Bulgaria	1997	Euro[4]	7,868	54	60	46	CB	Yes
Cayman Islands	1972	US dollar	35	<1			MA	Yes
Djibouti	1949	US dollar	657	1		3[3]	CB	
Eastern Caribbean	1950	US dollar	585	4	69	39[3]	CB	
Estonia	1992	Euro[4]	1,358	15	95	42	CB	
Faroe Islands	1949	Danish krone	50	1		49[3]	ComB	
Falkland Islands	1899	UK pound	3	<1			Govt	
Gibraltar	1927	UK pound	28	<1			Govt	No
Guernsey	1945	UK pound	65	1			Govt	No
Hong Kong	1983	US dollar	6,773	182	141	6	3ComB	Yes
Isle of Man	1961	UK pound	80	2			Govt	No
Jersey	1963	UK pound	90	2			Govt	No
Lesotho	1980	S African rand	2,087	6	106	80[3]	CB	No
Lithuania	1994	Euro[5]	3,476	34	59	44	CB	
Macau	1983	Hong Kong $	443	8	60	17	2ComB	
Namibia	1993	S African rand	1,823	12	53[3]	81[3]	CB	No
St Helena	1917	UK pound	7	<1			Govt	

Note: CB = central bank, CyB = currency board, MA = monetary authority, ComB = commercial bank(s).

[1] 2002. [2] Purchasing power basis. [3] 2000 or 2001. [4] Prior to the creation of the euro, the Deutsche mark was the anchor currency. [5] Prior to February 2002, the US dollar was the anchor currency.

Sources: Hawkins (2003b); IMF; World Bank.

Under a broad definition encompassing both orthodox currency boards and what writers such as Schuler (1999) have termed "currency board-like" systems, there are about 20 currency boards in operation today (see Table 7). Many of these are like the traditional colonial currency boards, operating in very small economies with limited financial systems (eg Faroe Islands, St Helena). They are essentially of only numismatic interest (like the fully backed banknotes issued by some Scottish and Northern Irish banks). The more interesting examples are the "modern day currency boards" operating in Bosnia and Herzegovina, Bulgaria, Estonia, Hong Kong SAR and Lithuania, and formerly in Argentina. Currency boards mostly operate in small open economies; only Hong Kong SAR has a gross national income exceeding USD 100 billion.

A risk related to the operation of currency boards is complacency about currency mismatches: see Goldstein and Turner (2003). In particular, it is hard for authorities pledging to uphold a fixed exchange rate simultaneously to tell banks not to be exposed to the risk of its abandonment. The Argentine debacle stands as a clear warning about this. Both the private and the public sectors in that country built up massive foreign currency denominated debt, but did not have the ability to generate foreign

currency earnings to service such debts. No monetary arrangement can or should disguise prudential mismatches of that kind.

Extent of backing

A classical currency board has 100% backing for currency. In a modern day currency board the backing rule is often extended to cover all monetary liabilities (the monetary base). This is very different from the position in major economies where reserves are equivalent to half or less of the currency issue (see Table B1 in Annex B).

A currency board cannot and does not guarantee that the broad money supply (which includes currency and all bank deposits) is matched by foreign reserves. If the banking system were *required* to do this it could not make any loans. Nevertheless, foreign currency liquidity safeguards must be built into the banking system to ensure the payment system continues to operate even in the face of a run on bank deposits. This is why the Argentine "convertibility plan" imposed quite demanding requirements on banks (Table 8), such as requiring them to maintain deposits with foreign banks held abroad. The watering down of these prudential measures (for example allowing banks to deposit a smaller fraction of reserves abroad and to use government bonds to satisfy the requirement) in early 2001 undermined the credibility of the whole system. In the end, bank deposits were frozen and the payment system ceased to function.

Table 8

Some characteristics of modern-day currency boards

	Bosnia	**Bulgaria**	**Estonia**	**Hong Kong**	**Lithuania**	**Argentina (until early 2002)**
Current anchor currency	Euro	Euro	Euro	US dollar	Euro	US dollar
Inception	1997	1997	1992	1983	1994	1991
Liabilities backed	Monetary base	Monetary base	Currency	Monetary base	Currency	Monetary base
Reserve ratio	10-15%	8%	3% & 10%	None	8%	20%
Base	All liabilities	All deposits	Wide range		Deposits <1 year	All deposits
Maintenance	10 days	1 month	1 month		1 month	1 month
Remunerated	Yes	No	Yes		No	Yes
Lender of last resort	No	Yes	Yes	Yes	Yes	Yes

[1] Insofar as the requirement could be met with assets held abroad.

Source: Ho (2002).

Currency boards and central banking

Some purists, such as Friedman (1993), Hanke (2002) and Schwartz (1992), argue that currency boards should have no liabilities other than the currency, hold no domestic currency assets and take on no "central banking" functions. In practice, some currency boards impose reserve requirements on banks (Table 8) and others accept other deposits from them. Engaging in these sorts of operations and providing some limited lender of last resort facilities are not inconsistent with a currency board so long as the full backing of the currency is not brought into question (ie so long as loans only involve "excess" reserves and do not lead to any discretionary expansion of the monetary base without foreign currency backing).

Historically, many currency boards operated in rudimentary colonial economies where domestic banking was little developed and capital flows small. Under these circumstances, there was a very

close relationship between the trade balance and monetary expansion. The transmission mechanism should have been like the classic Hume price-specie flow. If prices in the domestic economy started to rise faster, this would lead to a loss of competitiveness, exports would slow, reducing reserves and the money supply, dampening activity and reversing the initial price rise. All this should have happened without any policy action.

This simple result carries over to more sophisticated financial systems only under restrictive assumptions. In modern economies, there is not a one-to-one correspondence between international reserves and either currency or base money (although it is higher than in other economies); see Table B2 in Annex B. One reason is that currency boards may hold excess reserves as an "investment portfolio" in addition to those backing the currency. The relationship of reserves with broad money is weaker still.

Traditional forms of currency board did not involve an interbank money market. In the Falkland Islands, there is only one bank. In many British colonies the banks present were all branches of British banks that could settle between themselves in London. Modern day currency boards operate in sophisticated financial markets where the authorities are concerned about excess volatility in financial markets. Allowing volatile capital flows to automatically affect domestic money markets could result in very volatile interest rates. This is one reason why modern day currency boards may conduct some form of open market transactions. In Hong Kong SAR short-term interest rate volatility is now comparable to that in non-currency board economies, but in Estonia and Lithuania it is significantly higher, as it previously was in Argentina (Table B3). In some cases these relationships have changed over time. For example, the September 1998 reforms in Hong Kong,[15] designed to make their system less susceptible to capital outflows, especially speculative outflows (see HKMA (1998) and Yue (2001)), appear to have reduced volatility in short-term interest rates. In Argentina, a series of changes and foreshadowed changes, and the issue of pseudo-currencies by provincial governments, during 2001 were associated with both a marked reduction in the correlation between reserves and currency and an increase in volatility in financial markets (Tables B2 and B3).

Use of foreign currencies

Use of a foreign currency is probably a natural reaction in a small country closely linked through trade and finance to a large neighbour - be it the dollar, euro or the South African rand. Table 9 provides a list and some economic data; see www.dollarization.org for many references to the literature. The controversial policy issues, however, concern different situations. The first is whether large countries with a record of deficient monetary policy should embrace a foreign currency. The second is the converse: should countries faced with substantial unofficial use of foreign currency seek to reverse that situation?

Use of foreign currency as a policy choice

Use of a foreign currency appears attractive because it creates a stable measure of value to govern trade and finance and reduces transactions costs. However, it deprives the country of the main monetary policy weapon to deal with recession.[16] Unless there are capital controls, interest rates have to follow those in the anchor currency regardless of whether the using country is facing the same economic conditions. The authorities cannot stimulate domestic demand and improve competitiveness by a depreciation of the nominal exchange rate. The only alternative is lower domestic costs and prices. This can only work if the domestic economy is sufficiently flexible. Hong Kong perhaps enjoys such flexibility; many other economies do not. Apart from loss of seigniorage, the main economic difference from a currency board is that adoption of a foreign currency is much harder to reverse. This may have credibility benefits but if the initial conversion rate turns out to be have been inappropriate, the economy will suffer. One benefit over a currency board is that currency mismatches are eliminated: see Goldstein and Turner (2003).

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[15] In particular, the introduction of a discount window assuring availability of end-day liquidity.

[16] Changing required reserve ratios and quantitative controls remain as potential means of affecting interest rates and credit.

Table 9

Countries and territories officially using the currency of another country

	Currency used	Foreign currency adopted	Real GNI[1] (2002)	Population '000 (2002)	Comment
Andorra	Euro[2]	1278	1	70	President of France and the bishop of Urgel (Spain) are heads of state
Belarus	Russian rouble	Due 2004	53	9,931	
Cook Islands	NZ dollar	1965	<1	14	Since independence in 1965, has been in free association with New Zealand; own coins
East Timor	US dollar	2002	2	753	
Ecuador	US dollar	2000	41	13,112	
El Salvador	US dollar	2001	30	6,524	
Greenland	Danish krone	Before 1800	1	60	Self-governing
Guatemala	US dollar	2001	47	11,992	US dollar made legal tender but domestic currency also circulates
Kiribati	Australian dollar	1979	<1	95	Own coins circulate
Kosovo	Euro	2001	4	1,800	Part of former Yugoslavia
Lesotho	Rand	1974	6	2,087	
Liechtenstein	Swiss franc	1921	1	30	
Marshall Islands	US dollar	1979	<1	53	Since 1986 in free association with US
Micronesia	US dollar	1986	<1	122	Prior to independence, UN trust territory under US administration
Monaco	Euro[3]	1865	<1	30	
Montenegro	Euro	1999	2	620	Part of former Yugoslavia
Namibia	Rand	1992	12	1,823	
Nauru	Australian dollar	1968	<1	12	UN trust territory administered by Australia before independence
Niue	NZ dollar	1974	<1	2	Since 1974 in free association with New Zealand
Northern Cyprus	Turkish lira	1975	1	200	
Palau	US dollar	1981	<1	20	In free association with the United States, who had administered UN trust territory prior to independence
Panama	US dollar	1904	17	2,940	Own coins circulate
San Marino	Euro[4]	1897	<1	30	Own coins circulate
Swaziland	Rand	1974	5	1,088	
Tuvalu	Australian dollar	1978	<1	11	
Vatican City	Euro[4]	1929	<1	1	Own coins circulate

[1] In purchasing power terms; billions of US dollars. [2] Prior to the creation of the euro, both the French franc and Spanish peseta were legal tender. [3] Prior to the creation of the euro, the French franc was legal tender. [4] Prior to the creation of the euro, the Italian lira was legal tender.

Main sources: Edwards and Magendzo (2002); Levy-Yeyati and Sturzenegger (2002); Schuler (2000); IMF, *International Financial Statistics*, *Direction of Trade Statistics*; World Bank; SBS *World Guide*, 10th edition, 2002.

One particular problem with forgoing an independent currency would arise if the national central bank, unable to print money, were no longer able to provide an unlimited lender of last resort facility in the classic Bagehot (1873) sense. Insurance (public or private) could assist banks hit by bank-specific problems in an economy using another currency. But systemic shocks would be harder to handle because all banks would be affected at the same time. Limited emergency liquidity assistance could be provided by easing reserve requirements in times of stress, thus providing banks with liquidity. Use of excess foreign reserves or direct budgetary payments by governments may also be possible.

Some see virtue in the absence of a lender of last resort, arguing it would force private sector banks to be more prudent. In the case of banking systems dominated by international banks, the responsibility of providing emergency liquidity assistance would lie with the parent bank.[17] Moreover, it could be argued that authorities with no scope for independent monetary policy action will be more careful in the design of prudential policies to ensure the health of the banking system. Yue (2001) argues that such policies also tend to contribute to macroeconomic stabilisation.

Econometric studies have been mixed. While it seems that countries adopting a foreign currency have had lower inflation than those with their own currency, it is not clear whether fiscal policy has been more disciplined or whether economic growth has been faster or slower: see for example Schuler (1996) and Edwards and Magendzo (2003a,b). Panama, which has long used the US dollar, is the only independent Latin American country to offer long-term fixed rate mortgages, but interest rates there are higher than in Chile, which has a floating exchange rate.

Unofficial use of foreign currency

Citizens in some emerging economies make extensive domestic use of foreign currencies (see Table 10). There may be some advantages from this: in economies where citizens lack confidence in the domestic currency, economic activity is helped by the use of foreign currency. Hayek (1976) argued that, as with other products, competition between currencies improves their quality, a line of argument that was espoused by the UK government in discussions on a European currency in the late 1980s and early 1990s. Attempts to prohibit the use of foreign currency may do more harm than good. Nevertheless, there may be several complications for the operation of monetary policy.

Econometric studies show that macroeconomic performance tends to be worse in countries with extensive unofficial use of foreign currency.[18] For instance, De Nicoló et al (2003) and Gomis-Porqueras et al (2000) conclude that countries with a high unofficial use of foreign currency tend to experience greater macroeconomic volatility and are more prone to financial instability. But this is not necessarily causal as generally foreign currencies are more widely used in countries that are poorly managed in general. Similarly, exchange rate pass-through is significantly higher in those emerging economies with high unofficial use of foreign currencies (specifically as bank deposits); see Honohan and Shi (2002). But the high pass-through may be due to the history of high inflation in these countries (see Table 10). A further problem is that exchange rate depreciation could itself lead to a further fall in use of the domestic currency: see Kraft (2002) for some empirical work on this for Croatia.

Nevertheless, monetary control is likely to be weaker in economies where there is substantial use of foreign currency. Central banks can generally control interest rates on interbank transactions in the local currency, which are a major influence on interest rates charged by banks on loans in domestic currency. But the interest rates charged by banks on loans denominated in foreign currency depend in principle on foreign interest rates.

But there is still scope for the central bank to drive a wedge between foreign currency interest rates in the domestic market and those prevailing internationally. For instance, some countries use reserve requirements on foreign currency deposits and the interest rate paid on these reserves as supplementary instruments where necessary to support monetary policy.

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[17] How far such responsibility would extend in practice is an open question. Losses in Argentina, for instance, were larger than foreign banks' direct equity participations in Argentina. The decision on whether to pump in additional funds depends on foreign banks' perceptions about their prospects in that jurisdiction.

[18] Arteta (2003) however finds little evidence that these countries are more likely to have banking or currency crises, or that such crises are more severe.

Table 10

Some economies with widespread unofficial use of foreign currencies

	Currency used	Real GNI USD bn PP terms (2002)	Domestic currency as % of GDP (2002)	Bank deposits: foreign currency as % of total (2002)	Deposits of non-bank sector with offshore banks as % to domestic bank deposits (Dec 2002)	Imports as % to GDP (2002)	% of imports from country whose currency is used (2002)	CPI inflation (average annual rate 1990-2001)
Albania	Euro, US dollar	13	22	32	2	49	74	24
Argentina	US dollar	377	5	74[4]	90	12	12	7
Bolivia	US dollar	20	5	91	9	27	13	8
Bosnia & Herzegovina	Euro	24	16	55	21	81	41	2
Bulgaria	Euro	54	10	57[4]	8	60	46	101
Cambodia	USD, Thai baht	20	6	94	9	56	30[3]	5
Colombia	US dollar	257	5	Prohibited	29	21	32	20
Croatia	Euro	43	5[4]	71[4]	8	55	52	72
Laos	Thai baht	9	1	83[4]	5	32[4]	59[1]	30
Latvia	US dollar	21	11	44[4]	9	56	2	25
Lesotho	S African rand	6	2		13	106	80[1]	9
Macau	HK dollar	8	4	52[1]	8	61	17	4
Macedonia	Euro	13	7	65[4]	12	56[2]	44	8
Nepal	Indian rupee	33	13		3	29	33[1]	8
Nicaragua	US dollar	13	6[4]	71[4]	41[4]	78[4]	25	35
Paraguay	US dollar	25	5[4]	67[4]	40	38[4]	18	13
Peru	US dollar	128	3	66[4]	17	17	26	24
Romania	Euro	141	3	51	6	41	59	93
Russia	US dollar	1,127	7	54	17	24	6	86
Turkey	US dollar	426	2[4]	58[4]	13[4]	30[4]	7	78
Ukraine	US dollar	227	13	33	11	52[2]	1	200
Uruguay	US dollar	41	3[4]	85[4]	65	20	8	30
Venezuela	US dollar	127	3[4]	Prohibited	209	17	28	46

[1] 2000. [2] 1999. [3] Thailand; US accounts for only 2%. [4] 2001.

Main sources: Arteta (2003); Baliño et al (1999); De Nicoló et al (2003); Kovanen (2002); Padoa-Schioppa (2002); IMF, *International Financial Statistics*, June 2003, *Direction of Trade Statistics*; World Bank; BIS.

Successful macroeconomic stabilisation can be expected to lead to a decline in the unofficial use of foreign currencies. But this process takes time, as regaining credibility may be protracted. Peru's hyperinflation was brought under control following reforms in 1990 and inflation has been held under 15% since 1995 and under 5% since 1999. Yet half of bank deposits are still denominated in foreign currency. Indeed, there may be "network effects" such that once societies adapt to using a foreign currency, they may not switch back at all.[19]

Some countries try to encourage use of domestic currency deposits by levying lower reserve requirements on them, which may be passed on to depositors in the form of more attractive interest rates. Some countries, such as Canada, Czech Republic, Korea, Nigeria, Poland and Switzerland, exclude foreign currency deposits from the coverage of their deposit insurance schemes. Bolivia, Brazil, Israel and Nigeria have allowed banks to offer dollar-indexed deposits and Brazil inflation-indexed deposits, both of which may be attractive alternatives to foreign currency deposits (the danger with dollar-indexed debt of course is that such debt can become too large to service if the exchange rate collapses in a crisis). In Egypt, liberalising restrictions on domestic interest rates led to a marked fall in the proportion of foreign currency deposits. More direct attempts to prevent the use of foreign currencies (such as the steep fines or even gaol terms Ukraine imposed for domestic use of US dollars in 1996) are likely to drive depositors offshore. Permitting foreign currency deposits may allow domestic banks to retain deposits when some depositors lose confidence in the domestic currency and allow banks to more easily match foreign currency loans. Forced conversions into domestic currency (particularly if at an artificial exchange rate) are also likely to damage confidence in the domestic financial system. This was the experience of Bolivia and Mexico in 1982 and Peru in 1985.

4. Conclusion

Increasing capital mobility and weak financial systems have caused many emerging market countries to search for regimes that deliver both exchange rate stability and relatively immunity to speculative attack. Prominent candidates are regional currency arrangements, currency boards, and the unilateral adoption of a foreign currency. In addition, the informal use of a foreign currency may have some of the same implications, namely by limiting the possibility to use domestic monetary policy effectively.

These regimes differ in several respects. Regional currency areas are often associated with broader political objectives, rather than purely economic ones, though some estimates suggest that sharing a common currency can give a large boost to trade and output. The use of convergence criteria as qualifications for entry and on an ongoing basis is justified in part by the concern that political will needs to be demonstrated. Convergence criteria also serve the purpose of preventing fiscal policy from interfering with the conduct and credibility of monetary policy.

The unilateral adoption of a foreign currency, or its close cousin, the currency board, has the advantage of producing an immediate gain in credibility from the use of an established, and presumably stable, currency. The cost is the loss in flexibility that results, since it is likely to mean loss of influence over monetary policy. Currency boards are themselves not immune from crisis, which explains the interest in outright adoption of a foreign currency, despite the associated loss of seigniorage.

[19] See Feige et al (2000), Gomis-Porqueras et al (2000), Temprano Arroyo (2002), for the Croatian experience Kraft (2002) and for the Russian experience Oomes (2003).

Annex A:
Regional currency areas

Some examples of where three or more independent countries use or used a common currency are:

European Monetary Union (1999-): Austria, Belgium, Finland, France, Germany, Greece (joined in 2001), Ireland, Italy, Luxembourg, Netherlands, Portugal and Spain adopted a single currency, the euro, in 1999, although euro notes and coins were only introduced in 2002. See the paper by Strauss-Kahn in this volume.

Eastern Caribbean Currency Area (1950-): Anguilla (UK territory, joined 1987), Antigua & Barbuda, Dominica, Grenada (joined 1968), Montserrat (UK territory), St Kitts & Nevis, St Lucia and St Vincent & the Grenadines. Some former members left the area to establish their own currencies; Trinidad & Tobago in 1962, Guyana in 1965 and Barbados in 1972. The Eastern Caribbean dollar is pegged to the US dollar (prior to 1976 it had been pegged to sterling), but the United States is not a party to the agreement. The Eastern Caribbean Central Bank (ECCB) was established in 1983 to replace the Eastern Caribbean Currency Authority, which in turn had been the successor to the British Caribbean Currency Board. The ECCB operates as a quasi-central bank, but retains some currency board features; it maintains a minimum foreign exchange cover of 60% (70% before 1975 and 100% before 1965), although in practice the cover has usually exceeded 95%. The ECCA economies are all small, with a combined population of about half a million. See van Beek et al (2000) and Hendrickson et al (2002) for further information.

Central African Economic and Monetary Community, CAEMC (1945-): Cameroon, Central African Republic, Chad, Republic of Congo, Equatorial Guinea (joined 1985) and Gabon. Their common central bank is the Bank of the States of Central Africa and the common currency is the franc de la coopération financière en Afrique centrale. Originally created as a colonial currency in 1945, it was retained after independence. It has been pegged to the French franc, and now the euro, throughout this period, but was devalued by half in 1994. At least 65% of central bank reserves are held with the French treasury, which guarantees its convertibility into euros. Equatorial Guinea is the only member that is not a former French colony.

West African Economic and Monetary Union, WAEMU (1945-): Benin, Burkina Faso, Côte d'Ivoire, Guinea-Bissau (joined in 1997), Mali (left in 1962 but rejoined in 1984), Niger, Senegal and Togo. (São Tomé & Príncipe may be joining soon.) Their common central bank is the Central Bank of West African States and their common currency is the franc de la communauté financière d'Afrique. Originally created as a colonial currency in 1945, it was retained after independence. At least 65% of central bank reserves are held with the French treasury, which guarantees its convertibility into euros. It has been pegged to the French franc, and now the euro, for this period, but was devalued by half in 1994. Both the central African and west African currencies are commonly called the "CFA franc" but are not legal tender in the other region, In theory they could have different values but in practice they have always been the same. See Banny (2002) for further information.

East African Currency Board (1963-72): Kenya, Tanzania and Uganda operated a joint currency board after they gained their independence in 1961-63, essentially continuing colonial currency arrangements that had been in place since 1919. Gradually it was allowed to operate more like a central bank and in time it fell apart. By 1977 all three countries had exchange controls relating to each other's currencies. See Cohen (1998, p73) for more information.

Latin Monetary Union (1865-1914): Belgium, Bulgaria, France, Greece (joined in 1868), Italy and Switzerland formed a monetary union, initially for a 15-year period, but subsequently renewed.[20] It provided for the circulation of gold and silver coins (at a fixed parity) throughout the union by all members, identical in size and weight but with national designs, and acceptable as legal tender. The union ended with World War I. See Bordo and Jonung (1999), de Cecco (1992), Einaudi (2002) and

[20] In 1865, France proposed extending the union to include Britain and the United States, which would likely have ended up with most of the world as members. Despite some enthusiasm at a conference, the idea faded for lack of sustained political support. See Cohen (1998, pp 69-70).

Henriksen and Kærgård (1995) for further discussion. Flandreau and Maurel (2001) are sceptical on whether this union added anything to the gold standard arrangements.

Scandinavian Currency Union (1873-1913): Denmark, Norway (joined in 1875) and Sweden formed a monetary union when they adopted the gold standard (but note that the latter two were also in a political union until 1905) and a common unit, the krona. But they continued to issue their own notes and coins. At the outbreak of World War I they all abandoned both the gold standard and the currency union. See Bergman (1999) and de Vanessy (2003) for further information.

German and Austro-Prussian Monetary Unions (1838-67): Baden, Bavaria, Frankfurt, Hesse, Nassau Saxe-Meiningen (joined later), Schwarzburg-Rudolstadt (joined later) and Württemberg agreed on a monetary union with the northern states adopting the thaler and the southern states the florin with a fixed rate of exchange. All states agreed to issue silver coins in proportion to their population which were legal tender throughout the union. The 1857 treaty between Austria and the German member states fixed the exchange rate between the Austrian currency and the German currencies and members agreed to withdraw non-convertible notes. After the Battle of Sadowa, Bismarck issued a decree dissolving the union and its formal dissolution occurred through a treaty signed in 1867. See de Cecco (1992) and de Vanessy (2003) for more details.

Earlier monetary unions (1379-1814): Monetary unions such as the Hanseatic Monetary League and the Monetary Federation of the Rhine were negotiated when money was essentially coinage and its value was determined by the value of its gold or silver content. The monetary unions largely consisted of standardising the coins. See Einaudi (2002). There was a long-running monetary union involving paper currency until around 1750 between Connecticut, Massachusetts Bay, New Hampshire and Rhode Island; see Graboyes (1990).

Proposed regional currency areas

There are a number of proposed future RCAs. Some are now the declared aim of governments while others are academic conjectures. The following are those most discussed, and the subject of Table 5.

Greater Europe: Many eastern European countries are keen to join the European Union and the euro area. There are 13 official applicant countries; Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovak Republic, Slovenia and Turkey. Ten of these are likely to join the EU in 2004 and will then be expected to participate in the ERM II for at least two years in order to achieve convergence criteria before joining the euro area.

There are also discussions about a regional currency for Belarus, Kazakhstan, Russia and Ukraine by 2011; see Marchenko (2003).

Africa: The Economic Community of West African States (ECOWAS), which includes the eight members of the West African Economic and Monetary Union (see above) plus The Gambia, Ghana, Guinea, Liberia, Nigeria and Sierra Leone, declared their intention to form a broader monetary union by signing the Accra Declaration in April 2000. This had been stated as a goal of ECOWAS since its formation in 1975 and is intended to accompany a broader integration process. It has gained impetus since the election of a more sympathetic government in Nigeria, the largest of the ECOWAS economies. The first step was to have been monetary union among five non-WAEMU countries (Liberia is not participating) by January 2003 and to this end they pledged to limit fiscal deficits and co-ordinate macroeconomic policies. A West African Monetary Institute (WAMI) was established in 2000 as a precursor to a regional central bank. The current plan is for a monetary union of all the ECOWAS countries in 2004. See the papers by Ebi and Ojo in this volume, Addison (2002), Asante and Masson (2001), Debrun et al (2002), Masson and Pattillo (2001, 2003) and Ukpong (2002) for further discussion.

In 1999 Kenya, Tanzania and Uganda signed a treaty forming an economic bloc and laying grounds for a monetary union, which would be essentially reviving their former currency union. See Guillaume and Stasavage (2000) and Mkenda (2001).

Alesina et al (2002) report that 11 members of the Southern African Development Community are debating whether to form a monetary union, possibly centred on the rand. See also the paper by van Zyl in this volume.

The African Union (successor to the Organisation of African Unity) has recently reaffirmed the aim of a common African currency, perhaps by 2021, although there appear to be few tangible steps taken towards implementing it; see the paper by Ojo in this volume, Masson and Pattillo (2003) and Ogunkola (2002).

Arabian Gulf: The Gulf Cooperation Council, comprising Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates was founded in 1981 and one of its initial goals was to move towards a common currency. The successful launch of the euro invigorated these aspirations and the Council announced in early 2002 a customs union by 2003 (brought forward from 2005) and a plan for a common currency by 2010. A new currency, possibly to be called the Gulf dinar, will be established. As an interim step, all member currencies are pegged to the US dollar. A committee of central bank governors, and a technical committee of central bankers, is working on the project. Oil or related products account for 70-80% of revenue in all of the countries. See the papers by Al-Bassam, Al Falasi, Al-Jasser and Al-Hamidy, and Al-Thani in this volume, Abed et al (2003), Fasano and Iqbal (2002), Jadresic (2002) and Laabas and Limam (2002) for further information.

Latin America: The Mercosur countries (Argentina, Brazil, Paraguay, Uruguay, with Bolivia and Chile as associate members). In 1997, Argentina's then president Carlos Menem proposed such a currency union in the indefinite future. At their presidential summit in 2002, the idea of a "Monetary Institute of Mercosur" as an embryonic central bank was informally discussed. With Argentina and Brazil having been forced off their exchange rate pegs in the last couple of years, the idea may gain more support. See Eichengreen (1998) and Fratianni and Hauskrecht (2002) for academic support for the idea that an RCA would support the push for deeper integration within Mercosur, Ferrari-Filho (2002) for a critique and Belke and Gros (2002) for a further discussion.

The Andean Community (Bolivia, Colombia, Ecuador, Peru and Venezuela) signed an agreement in 1969 calling for "harmonisation of exchange rate, monetary, financial and fiscal policies", and set some convergence criteria (see Table 6) but no firm plans for establishing an RCA. See Scandizzo (2002) and Temprano Arroyo (2002).

The Central American Common Market countries (Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua) have as a medium-term goal a monetary union, but some members have recently adopted the US dollar.

Caribbean: CARICOM agreed in 1992 that its eight members which are currently not part of the ECCB area (Bahamas, Barbados, Belize, Guyana, Haiti, Jamaica, Suriname and Trinidad & Tobago) should join it to form a Caribbean-wide single currency, but it has not been implemented. See Worrell (2003).

North America: Canada, Mexico and the United States are members of the trade group NAFTA. Given the high proportion of Canada and Mexico's trade with the United States, a NAFTA dollar or "Amero" has been proposed by some Canadian academics such as Grubel (1999). See also Beine and Coulombe (2002) and Robson and Laidler (2002).

Asia: In December 1998, ASEAN (Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Vietnam) leaders endorsed a project to study the feasibility of a common ASEAN currency and a task force of central bank officials led by Bank Negara Malaysia was established in August 2000; see the note by Ooi and Singh in this volume. The head of the Hong Kong Monetary Authority raised the possibility of a wider common Asian currency in Yam (1999), albeit in the distant future. The idea has also been discussed by academics such as Kim and Ryou (2001) and Mundell (2003) and in a paper commissioned from Bayoumi and Mauro (1999). One factor favouring an RCA in Asia is that the countries have diversified trading partners so there is no obvious candidate currency to which to link. Kang and Wang (2002) provide a recent overview.

South Pacific: Hargreaves and McDermott (1999), Brash (2000), Grimes and Holmes (2000) and Coleman (2001) provide a discussion of suggestions for Australia and New Zealand to adopt an "Anzac dollar". The latter studies note that half the New Zealand public and the majority of NZ business leaders support a monetary union. New Zealand Prime Minister Helen Clark regards the idea as worth considering. However, given that the Australian economy is seven times as large as that of New Zealand, it may be more realistic to think in terms of New Zealand adopting the Australian dollar. The topic of a currency union is little discussed in Australia and the advantages there would probably not outweigh the costs of introducing a new currency. The five small Pacific nations currently using either the Australian or NZ dollars could also join, as could Fiji, Papua New Guinea, the Solomon Islands and Vanuatu, for whom Australia is the largest trading partner.

Table A1

Members of regional currency areas

	Population in thousands (2002)	Real GNI USD bn (2002)	Currency used	Imports as % of GDP (2002)	% of imports from (exports to) fellow members (2002)
Anguilla	12	<1	EC dollar		
Antigua & Barbuda	69	1	EC dollar	86[1]	
Austria	8,141	230	Euro	52	63 (55)
Belgium	10,320	282	Euro	82[2]	61 (61)
Benin	6,603	7	CFA franc (W)	36[2]	6 (7)
Burkina Faso	11,831	12	CFA franc (W)	26	29 (6)
Cameroon	15,523	25	CFA franc (C)	20[3]	2 (4)
Central African Republic	3,828	5	CFA franc (C)	11[2]	8 (2)
Chad	8,144	8	CFA franc (C)	42[2]	3 (4)
Congo, Republic	3,190	2	CFA franc (C)	50	5 (0)
Côte d'Ivoire	16,775	24	CFA franc (W)	35[2]	1 (13)
Dominica	72	<1	EC dollar	66[1]	4 (17)[1]
Equatorial Guinea	481	3	CFA franc (C)	21[1]	3 (2)
Finland	5,199	132	Euro	30	33 (33)
France	59,442	1,556	Euro	25	56 (49)
Gabon	1,291	7	CFA franc (C)	50[4]	2 (0)
Germany	82,495	2,163	Euro	32	43 (43)
Greece	10,631	194	Euro	27	46 (30)
Grenada	102	1	EC dollar	85[1]	2 (15)
Guinea-Bissau	1,253	1	CFA franc (W)	31[2]	15 (1)
Ireland	3,878	109	Euro	73	20 (38)
Italy	57,919	1,467	Euro	26	50 (45)
Luxembourg	444	23	Euro	128	74 (73)
Mali	11,346	10	CFA franc (W)	39[2]	22 (3)
Montserrat	8	<1	EC dollar		
Netherlands	16,144	443	Euro	60	42 (63)
Niger	11,542	9	CFA franc (W)	24[2]	22 (4)
Portugal	10,032	174	Euro	38	70 (67)
St Kitts & Nevis	46	<1	EC dollar	71[2]	3 (2)
St Lucia	159	1	EC dollar	58[2]	2 (7)
St Vincent & Grenadines	117	1	EC dollar	66[2]	1 (5)
Sénégal	10,007	15	CFA franc (W)	38[2]	4 (14)
Spain	41,180	843	Euro	30	57 (59)
Togo	4,767	7	CFA franc (W)	50[2]	4 (27)

Note: (W) West African Economic and Monetary Union; (C) Central African Economic and Monetary Community.
[1] 2000. [2] 2001. [3] 1999. [4] 1998.

Sources: IMF, *International Financial Statistics*, June 2003, *Direction of Trade Statistics*; World Bank.

Applied literature on optimum currency areas (OCAs)

Goodhart's (1995) much-cited comment that "the theory of optimum currency areas has relatively little predictive power. Virtually all independent sovereign states have separate currencies, and changes in sovereign status lead rapidly to accompanying adjustments in monetary autonomy" has not deterred a large number of economists from assessing which economies form OCAs.

Bayoumi and Eichengreen (1994) used a structural vector autoregression approach and concluded that there were three plausible sets of candidates for monetary unification. One was in Europe (Austria, Belgium, Denmark, France, Germany, the Netherlands and perhaps Switzerland), one in northeast Asia (Japan, Korea and Taiwan) and one in southeast Asia (Hong Kong SAR, Indonesia, Malaysia, Singapore and possibly Thailand), but none in the Americas.

A study using similar techniques reported in Alesina and Barro (2001) concludes "there seems to be a fairly clear dollar area involving Canada, Mexico, most of Central America, and parts of South America. The Philippines, Hong Kong and Singapore also belong [to the dollar zone]. The euro area includes all of Western Europe and most of Africa. There does not seem to be a yen area beyond Japan, except perhaps for Indonesia".

Europe

A number of studies find that western Europe does not meet the OCA criteria as closely as do the US states or groups of states; see for example UK Treasury (2003b). This is particularly true for labour mobility, unsurprisingly given that the United States has (more or less) a single language. Studies such as Bayoumi and Eichengreen (1994) also show that shocks are more highly correlated within the United States. However, a more disaggregated study by Bayoumi and Prasad (1995) suggests that the relative importance of aggregate, industry-specific and region-specific shocks is similar in the United States and Europe.

Masson (1999) suggests central European countries' industrial structure does not imply obvious problems of asymmetric shocks in forming a currency union with western Europe. Fidrmuc and Korhonen (2001) conclude that Estonia, Hungary and Latvia have faced supply shocks similar to those of the euro area and Estonia, Hungary and Poland similar demand shocks. It is likely that the shocks are becoming more similar as the economies complete the transition phase and have increasing trade and investment links with western Europe.

Arabian Gulf

Alkholifey (2002) reports that, unsurprisingly as they as are all highly oil-based, the correlations of output growth between the Gulf economies are high. For the same reason, their total trade with each other is very small, although as Jadresic (2002) notes, they buy large shares of non-oil exports from each other. Despite their common language, labour mobility among the Gulf states is relatively low. He notes that capital movements between the Gulf states are still restricted by regulation, lack of transparency and the absence of mutual listings in each other's markets.

Laabas and Limam (2002) find that the real exchange rates of the Gulf economies are closely related and note the political resolve as favouring an RCA. While intraregional trade is currently low and business cycles not that correlated, this may change following adoption of an RCA.

Asia

Wyplosz (2001) argues that, as Asian intraregional trade is already surprisingly high as a proportion of total trade, currency union may have less of a trade-enhancing effect in Asia. Defining shocks as residuals from time series models of real GDP, he finds they are much less correlated within Asia than within Europe (although there is a correlated subgroup of Korea, Malaysia and Thailand).

Eichengreen and Bayoumi (1999) point to the much wider variation in the economic and financial conditions in Asia than was the case in western Europe. Some Asian financial markets are very open while others remain highly regulated and closed. Their empirical work suggests that "on standard optimum currency area grounds, the economies of east Asia would seem to be more or less as

plausible candidates for internationally harmonised monetary policies as the members of the European Union. While they do not satisfy all the standard OCA criteria, nor does Europe."

Bayoumi et al (2000) look at the ASEAN countries, note the high intraregional trade and find "underlying (aggregate supply) disturbances are relatively highly correlated across certain ASEAN countries, but the correlations are typically lower than they were in Europe ... the speed of adjustment is much faster in ASEAN, presumably reflecting the region's more flexible labour markets ... [and] the transmission mechanism of monetary policy is only slightly more diverse within ASEAN than in the euro area". They conclude "overall, on the economic front ... ASEAN today is less suitable for a regional monetary arrangement than the euro area was before the Maastricht Treaty, but the differences are not large". But politically, there is a lot further to go.

Baek and Song (2002) note that intraregional trade is as high within east Asia as within western Europe. While manufactured goods are a similarly high proportion of exports in most Asian economies (not Brunei, Myanmar and Vietnam), there are significant differences in the type of manufactured exports, with Japan and Korea large exporters of heavy machinery but China and Indonesia exporting lower-value products. Using the approach of Eichengreen and Bayoumi (1999), they find significantly correlated supply disturbances within Hong Kong, Indonesia, Japan, Korea, Malaysia and Thailand (and marginally so with Taiwan), suggesting these economies could form an OCA. Broadly the same group of economies have correlated demand shocks also. A similar study by Zhang et al (2003) concludes there are similar supply shocks among some ASEAN economies (Indonesia, Malaysia, Singapore and Thailand) and among some east Asian economies (Hong Kong, Japan, Korea and Taiwan) but demand and monetary shocks are not very correlated within Asia. Choi (2002), while generally supportive of Asian currency union in the long term, warns that labour mobility in most of Asia is much lower than in western Europe and that China and Japan face asymmetric shocks. For the subgroup of ASEAN countries, though, Madhur (2002) believes capital and labour mobility, and price and wage flexibility, compares well with Europe.

Sabhasri and Janevathanavitya (2001) conclude that Korea, Malaysia, the Philippines, Singapore and Thailand (but not Indonesia) would be suitable candidates to join a yen currency area. Yuen (2000) suggests there are three pairs of economies that could each adopt a common currency; Malaysia and Singapore, Japan and Korea, and Hong Kong and Taiwan. These could later be joined by other economies to form "clusters" and eventually merge into a single Asian currency.

But there remain large differences between some Asian countries. Even within China, Hong Kong does not yet form an OCA with the mainland, according to Tsang (2002).

Oceania

Counterfactual simulations by Grimes and Holmes (2000) lead them to conclude that a currency union of New Zealand with Australia (or the United States) would not impair the buffering role of the exchange rate.

Americas

Murray (1999) argues that Canada's terms of trade move in opposite directions to those of the United States in response to fluctuations in commodity prices. He also cites work suggesting that structural shocks hitting Canada, Mexico and the United States share very few common characteristics, whereas those hitting regions within the United States are similar and those hitting the Canadian provinces are similar. However, Beine and Coulombe (2002) argue that it would be advantageous for the two largest Canadian provinces to use the US dollar.

Levy-Yeyati and Sturzenegger (2000) conclude that the Mercosur countries do not constitute an OCA, and are unlikely to do so in the future. They argue the countries would be better off adopting the US dollar. Compared to western Europe, there is much less trade and labour mobility among the members, wider differences in average income and less similarity in the shocks facing them. The euro had credibility from being seen as, in a sense, the successor to the strong Deutsche mark. For Mercosur to gain this kind of credibility, they would need to adopt the US dollar.

Scandizzo (2002) reports that within the Andean Community the strongest output correlations are between the oil exporters Colombia, Ecuador and Venezuela, but these are below those between

European countries. Interregional trade is much smaller than within Europe, and well below that in Mercosur. The Andean countries also have very rigid labour markets.

Temprano Arroyo (2002) says that no Latin American regions meet the traditional OCA criteria. However, taking into account aspects such as unofficial use of foreign currencies and credibility problems, there may be a case for monetary integration. Berg et al (2002) conclude Latin American countries do not constitute an OCA as they do not trade that much with each other, face diverse shocks and have uncoordinated business cycles.

Africa

Masson and Pattillo (2001) examine the project of creating a currency union among all the 15 economies of West Africa. They note that the problem of asymmetric shocks (a key element of the OCA literature) is especially acute for the region, since Nigeria as a major oil exporter faces very different terms of trade to the other countries. Ogunkola (2002) concurs, adding that many African economies are dominated by (differing) single commodities. Masson and Pattillo (2001) also note the relatively low level of intraregional trade (see Table 3), which suggests that the transaction cost savings from a common currency might not be very great.

Mkenda (2001) concludes that Kenya, Tanzania and Uganda tend to be affected by common shocks.

USA

There are also studies of whether existing countries are OCAs. Kouparitsas (2001) concludes based on sources and responses to shocks that while New England, the Mideast, Great Lakes, Rocky Mountains and Far West form an OCA, the Southeast, Plains and Southwest do not belong.

Annex B:
Currency boards

Currency boards have by constitution full backing of the currency by foreign assets (Table B1). They also tend to have more foreign assets relative to the money supply than do central banks.

Table B1

Currency boards and central banks: size of foreign assets (end-2002)

	% to currency	% to money base	% to broad money
Currency boards			
Argentina[1]	164	84	20
Bahamas	241	81	10
Bosnia and Herzegovina	144	108	46
Bulgaria	269	195	66
Djibouti	130	116	20
East Caribbean	243	99	...
Estonia	214	128	33
Hong Kong SAR	737	339	28
Lesotho	2,143	770	178
Macau SAR	1,775	864	37
Namibia	...	293	27
Median	*242*	*116*	*31*
Other			
China	134	50	12
Euro area	95	55	6
Japan	71	52	8
United Kingdom	19	23	1
United States	12	11	1

[1] End-2001.

Source: IMF, *International Financial Statistics*, June 2003, lines 11, 14, 14a, 34, 35; Eastern Caribbean Central Bank.

Currency boards were little discussed in the economics literature during the first decades of their existence. Interest in them surged after their readoption by Hong Kong in 1983 and Argentina in 1991. However, this literature generally made simplifying assumptions appropriate to the simple colonial currency boards but not to modern day systems; see Hawkins (2003b,c). One implication of these assumptions was an almost fixed relationship between currency and broad money. Table B2 shows this is not the case.

While interest rates were less relevant in the colonial currency boards, they are crucial to understanding the transmission mechanism in modern day currency boards, as they are in understanding the operation of central banks. Inflation in modern day currency boards is determined by the effect of domestic interest rates (heavily influenced by those in the reserve currency economy) on domestic activity with non-tradable prices in the reserve currency economy providing a loose anchor. See Hawkins (2003b) for a fuller discussion and Ha et al (2002) for an econometric model of a currency board economy from a similar intellectual tradition.

Table B2

Correlation of monthly change in monetary authority foreign assets with

		Currency	Base money	Broad money
Currency boards				
Argentina	Jan 1996-Dec 2000	0.60	0.60	0.36
Argentina	Jan 2001-Dec 2001	0.11	0.45	0.71
Bosnia & Herzegovina	Jan 1998-Dec 2002	0.87	0.99	0.89
Bulgaria	Jan 1988-Dec 2002	0.35	0.40	0.24
Djibouti	Jan 1996-Oct 2002	0.61	0.74	–0.01
Estonia	Jan 1996-Dec 2002	0.50	0.85	0.15
Hong Kong SAR	July 1997-June 1998	0.02	0.80	–0.93
Hong Kong SAR	Jan 1999-Dec 2002	0.05	0.24	0.49
Lesotho	Jan 1996-Nov 2002	0.02	0.03	–0.08
Lithuania	Jan 1996-Oct 2002	0.14	0.08	–0.04
Other economies				
Australia	Jan 1996-Dec 2002	0.26	0.15	–0.05
Chile	Jan 1996-Dec 2002	0.52	–0.01	0.05
Latvia	Jan 1996-Dec 2002	0.31	0.39	0.24
United Kingdom	Jan 1996-Dec 2002	–0.16	–0.04	–0.23
United States	Jan 1996-Sep 2002	0.23	0.24	0.14

Source: BIS calculations based on data from IMF, *International Financial Statistics*. Foreign assets are line 11, currency line 14a, money base line 14 and broad money the sum of lines 34 and 35.

Another difference with the modern day currency boards is the existence of an active foreign exchange market. Arbitrage should keep market rates close to the official rate. Empirically it had been the case that deviations from the link rate were higher in Hong Kong SAR where only currency transactions were conducted at the link rate, than in Argentina, where convertibility had also applied to bankers' deposits with the central bank.

Table B3

Short-term volatility of interest rates[1]

Currency boards			Other economies		
Argentina	Jan 1996-Dec 2000	52	Argentina	Feb 2002-Dec 2002	712
Argentina	Jan 2001-Dec 2001	310	Australia	Jan 1996-Dec 2002	1
Estonia	Jan 1996-Dec 2002	139	Chile	Jan 1996-Dec 2002	9
Hong Kong SAR	Jan 1996-June 1997	28	Latvia	Jan 1996-Dec 2002	59
Hong Kong SAR	July 1997-June 1998	65	United Kingdom	Jan 1996-Dec 2002	19
Hong Kong SAR	Jan 1999-Dec 2002	5	United States	Jan 1996-Dec 2002	12
Lithuania	Jan 1996-June 2002	88			

[1] Average daily absolute changes in one-month money market rates; basis points.

Sources: Bloomberg; national data.

Annex C:
Seigniorage losses from adopting a foreign currency

Seigniorage is the rate of return earned on central bank assets multiplied by currency on issue (less costs of printing the currency, but these are minor in all but the smallest economies). Table C uses the government bond yield (a risk-free domestic asset for the central bank, and an alternative source of funding for the government) as the rate of return for central bank assets. If currency on issues grows in proportion to GDP, a simple assumption consistent with observed patterns,[21] then if interest rates are unchanged seigniorage will be a constant proportion of GDP. The amounts in Table C are not insignificant but are small relative to the output losses from currency and banking crises.

Table C

Currency seigniorage (% to GDP; average 1999-2001)

China	0.7
Indonesia	0.3
Korea	0.2
Singapore	0.1
Thailand	0.1
Brazil	0.8
Mexico	0.3
Hungary	0.5
Poland	0.3
Russia	1.4
South Africa	0.2
Advanced economies[1]	0.1

[1] Simple average of Australia, Canada, Switzerland and the United Kingdom.

Source: Hawkins (2003a).

Seigniorage calculations sometimes include below market interest rates paid on reserves banks are required to hold with the central bank. But even if a foreign currency is officially adopted, banks could be required to hold such reserves with a government department and so this quasi-tax could still be collected. Within an RCA it may be better for the regional central bank to do this and then share the proceeds among its members, perhaps after meeting the cost of bank supervision if this is conducted by the regional central bank.

In a country with substantial currency substitution, the amount of domestic currency on issue will be correspondingly lower, and so the loss in seignoriage smaller. It is, however, quite hard to quantify this due to the many factors affecting currency/GDP ratios. Less developed financial systems, availability of high denomination banknotes, larger "underground" economies and other forms of tax evasion, lower crime rates, low acceptance of credit cards and electronic money all lead to higher usage of currency. Comparing domestic currency usage in economies with and without substantial currency substitution suggests currency is of the order of 1% of GDP lower in the latter on average.

[21] Berg and Borensztein (2000) instead assume currency on issue will grow by 0.3% of GDP each year, the annual increase in the G7 countries over the 1990s. But some (or perhaps a lot) of the increased issue of G7 currency was being used outside the G7 so this may not be a good assumption for emerging economies. If forms of electronic money become prevalent currency may contract, although there has been minimal sign of this happening so far; see Hawkins (2001).

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