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To:            Members of the Executive Board  
From:         The Secretary  
Subject:      **Currency Board Arrangements - Issues, Experiences, and  
Implications for Fund-Supported Programs**

Attached for consideration by the Executive Directors is a paper on issues, experiences, and implications for Fund-supported programs with respect to currency board arrangements, which will be discussed in a seminar proposed for Wednesday, January 22, 1997. Conclusions and issues for discussion appear on pages 39-41.

Mr. Baliño (ext. 38551) or Mr. Enoch (ext. 35372) is available to answer technical or factual questions relating to this paper.

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INTERNATIONAL MONETARY FUND

**Currency Board Arrangements: Issues, Experiences, and  
Implications for Fund-Supported Programs**

Prepared by the Monetary and Exchange Affairs Department  
(In consultation with other Departments)

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December 18, 1996

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## **Executive Summary**

Currency board arrangements (CBAs) have undergone a revival. Several Fund members maintain or are considering setting up such monetary arrangements. In some cases, establishing a currency board arrangement is a major piece of a stabilization program for which a member requests the Fund's support. Questions arise, therefore, as to what defines a CBA, what their strengths and weaknesses are, what constraints they impose on policies, what the experience with them has been, and what should the Fund's policy be vis-à-vis members that contemplate or are implementing such arrangements. This paper examines these issues and identifies possible topics that Directors may wish to cover in their discussion of the topic.

### **I. DEFINITIONS AND BASIC FEATURES**

A CBA is a special type of pegged exchange rate arrangement, governed by strict rules. These include an explicit legislative commitment to exchange domestic currency for a specified foreign currency at a fixed rate, and the requirement that domestic currency be issued only against foreign exchange. In practice, CBA features vary. A pure CBA is unable to perform traditional central bank functions, such as monetary regulation and lender-of-last-resort (LLR). However, most countries presently maintaining CBAs allow those functions to be performed in a limited fashion. There are variations in other aspects of CBAs as well, such as the breadth of the monetary liabilities that the CBA covers, and the types of foreign assets deemed eligible to back the currency. There are also organizational differences, for instance, whether a CBA is a separate institution or operates within an existing central bank.

Under a CBA, reserve money issue follows similar rules to those of the gold standard. Changes in money demand are accommodated by endogenous changes in international reserves, rather than by changes in the central bank's net domestic assets. Interest rate differentials and the consequent capital movements play a major role in adjustment. However, as in other pegged exchange rate arrangements, on occasion capital flows can complicate the operation of the arrangement. Examples of this were inflows to Estonia after the initial stabilization and outflows from Argentina in 1995.

### **II. CONSIDERATIONS FOR ADOPTING A CURRENCY BOARD**

CBAs may be attractive to small open economies with limited central banking expertise and incipient financial markets, countries that wish to belong to a broader trade or currency area, or that envisage joining a currency union. Also, their introduction can be helpful in countries where policy credibility is low because of poor inflationary performance or too short a time to establish a track record of strong policies. CBAs have several strengths: they are simple to operate, strengthen credibility in sound monetary and fiscal policies, and thus can make a strong contribution to macroeconomic stabilization and can help sustain the gains from stabilization. Their operational simplicity—based on well-known rules—makes them

particularly attractive for newly-independent countries or for those emerging from chaos (such as Bosnia and Herzegovina).

CBAs have also been established to enhance the credibility of exchange-rate based disinflation policies; that has been the case of Argentina, Estonia, and Lithuania. The transparency of CBAs and the strict limits they put on monetization of government deficits or credits to the banking sector can rapidly strengthen credibility. That credibility has helped interest rates in CBA countries converge rapidly towards international levels. Lower interest rates in Argentina, Estonia, and Lithuania contributed to strong economic recoveries after the stabilization period. Argentina's CBA also succeeded in bringing inflation to a low level and in keeping it low. In the Baltic countries and Hong Kong, though, inflation has been moderate but higher than in their trading partners.

CBAs' weaknesses are the flip side of their strengths. The commitment to a fixed parity deprives the authorities of a tool to deal with real exchange rate misalignment; the restrictions on monetary operations and particularly on lending of last resort limit the authorities' options to manage a financial crisis, or to manage destabilizing capital flows.

Most exchange-rate based stabilization programs have experienced post-stabilization booms and some exchange rate overvaluation. Large real exchange rate misalignments are a more serious cause for concern in CBAs, because their correction could require a prolonged period of tight liquidity and high unemployment particularly in the presence of price and wage rigidities. In Argentina, Estonia, and Lithuania the real exchange rate appreciated substantially after CBAs were introduced. This need not necessarily mean a loss of competitiveness, since the appreciation might also have been caused by other factors, such as an initially undervalued exchange rate.

The need to preserve the currency backing limits the ability of a CBA to act as lender of last resort. That can be problematic, particularly in cases where capital mobility is high but banks have limited access to foreign funds—such as was the case in Argentina in 1995—or where banking systems are weak—as was the case in Estonia and Lithuania. Also, a pure CBA that prevents all discretionary monetary operations would prevent authorities from adopting measures—such as temporary sterilization of capital flows or moderation of interest rates—that can be helpful in the absence of perfect interest rate arbitrage.

The strengths and weaknesses of CBAs suggest that strong macroeconomic policies are a crucial element of a successful CBA. While a CBA can enhance credibility it cannot do so in the absence of fiscal discipline. Moreover, a sound banking system, which minimizes the need for LLR support and allows banks to withstand interest rate fluctuations, makes a CBA more resilient. Finally, flexible labor and goods markets can help to avoid a real exchange rate misalignment that could raise unemployment and cause pressure for the abandonment of the CBA.

### **III. THE SCOPE FOR MONETARY POLICY AND LLR**

As long as sufficient resources are available and the authorities follow clearly specified rules, some flexibility to carry out monetary operations and provide LLR support can make a CBA more resilient and therefore more credible. In all cases, these operations should be carried out without undermining the required backing of the CBA. Moreover, the authorities need to review their monetary instruments, prudential requirements, and mechanisms that could provide support to banks at times of stress, so that the monetary and banking system can function smoothly within the constraints that the CBA imposes.

### **IV. EXCHANGE RATE DETERMINATION AND EXIT ISSUES**

Countries operating under a peg have from time to time adjusted their exchange rates. That option is difficult or impossible to exercise under a CBA. That is one reason to analyze whether a CBA should be a permanent or transitory arrangement, and how a country that wishes to exit from a CBA can do so with minimal disruption.

Countries that derive obvious trade and other benefits from belonging to a common currency area are likely to wish to stay within a CBA or to switch to another form of external discipline, such as a monetary union. Other countries may view CBAs as arrangements of an indefinite duration, until their credibility enhancement effect is no longer required or the institutional arrangements for a full-fledged central bank can be put in place.

There are few experiences of exit from a CBA, excluding those linked to countries attaining independence. The experiences of Malaysia and Singapore suggest that the likely disruption caused by the exit can be reduced or eliminated if the exit takes place when the pressure is for appreciation of the currency. It is conceivable that similar benefits would obtain if a CBA was replaced by another monetary arrangement that imposes tight constraints, such as a monetary union.

Abandoning a CBA when there is pressure for depreciation will likely have a high credibility cost. This suggests that in such circumstances, other means to rebuild credibility will be needed. In particular, the authorities would have to introduce a policy package that includes a tight fiscal and monetary stance and addresses structural rigidities, probably as part of a Fund-supported arrangement.

### **V. IMPLICATIONS OF CBAS FOR THE DESIGN OF FUND-SUPPORTED PROGRAMS**

The possibility of accessing Fund resources can enhance a CBA's chances of success. Such support can be useful both at the inception of a CBA and at times when the arrangement faces shocks. For instance, in Lithuania, Fund financial resources helped to manage the potential demand for conversion of the domestic monetary base into foreign currency that might otherwise have led to payments restrictions or raised questions about the viability of the CBA.

Fund support can also be helpful when a CBA comes under stress, for instance owing to capital outflows, as was the case in Argentina in 1995. In such a case, it serves to reestablish confidence even if the country in the end does not need to draw from the Fund. Also, the existence of a CBA has implications for the design of the program. For example, it would affect the level of foreign exchange reserves that is deemed appropriate, as well as the design of the targets set in the program. Furthermore, other factors, such as the existence of mechanisms to deal with banking problems within the CBA constraints, would need to be considered in analyzing the viability of the program and its resilience to shocks.

## I. INTRODUCTION

1. CBAs have undergone a revival.<sup>1</sup> Four Fund-supported adjustment programs—Argentina, Djibouti, Estonia, and Lithuania—were recently undertaken with CBAs, and one is under discussion with Bulgaria. Bosnia and Herzegovina is about to establish a CBA. Fund staff have discussed the appropriateness of introducing CBAs in other post-chaos countries, such as Somalia and Liberia. The authorities in El Salvador have expressed interest in exploring that alternative as a way to enhance credibility and policy transparency. For the same reasons, proponents of CBAs have made the case for establishing them in other countries, such as Mexico following the 1995 crisis, Peru, Brazil and Russia.
2. The interest in CBAs has overlapped with that of exchange rate-based nominal anchors. Although CBAs have distinctive characteristics, they have much in common with *conventional fixed peg arrangements*. Hence, much of the extensive analysis made of the latter also applies to the former. In particular, the ample debate on the relative merits of fixed versus flexible exchange rates is directly relevant to countries contemplating a CBA. Since the Executive Board has already reviewed experience with nominal anchors, this paper compares CBAs to conventional fixed pegs, and does not address the broader issue of the choice of an exchange rate regime.<sup>2</sup> In this context, what is of particular interest in CBAs is the decision to legislatively restrict the use of some policy tools—restrictions that are rarely explicitly present in conventional fixed peg regimes.
3. The paper focuses on three sets of key issues deemed as particularly relevant for Fund surveillance and conditionality. First, based on the performance of past and existing CBAs, it reviews the costs and benefits of such arrangements, discusses the main conditions for entry, and assesses the conditions under which it would be appropriate for the Fund to support their introduction. The paper centers on the experience of a sample of countries that are currently operating CBAs, including Hong Kong, Argentina, Estonia, Djibouti, and Lithuania, as well as those of some extinct CBAs, such as Malaysia and Singapore, Ireland, and two early Argentine experiences.<sup>3 4</sup>

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<sup>1</sup>The general literature on CBAs has expanded rapidly in recent years. See in particular Hanke and Schuler (1991 and 1994), Bennett (1993 and 1994), Humpage and McIntire (1995), Hanke and Walters (1992), Osband and Villanueva (1993), Schwartz (1993), Guitián (1995), Williamson (1995), and Zarazaga (1995).

<sup>2</sup>The Board discussed the issue at Executive Board Seminar 94/9, on November 9, 1994. Also, see "IMF Conditionality: Experience Under Stand-By and Extended Arrangements, Part II: Background Papers," *IMF Occasional Paper 129*, September 1995.

<sup>3</sup>In addition, the CBAs of Brunei Darussalam and the countries that are members of the Eastern Caribbean Central Bank (ECCB) are among the sample of currently operating CBAs  
(continued...)

4. Second, the paper discusses the trade-off between flexibility and credibility in CBAs and whether CBAs should best be viewed as transitional arrangements. In that context, it reviews alternative exit strategies.

5. Finally, the paper reviews issues related to Fund-supported programs with CBAs. It first discusses whether the traditional criteria and purpose for utilizing Fund resources need to be interpreted differently or reformulated in CBAs. It then examines whether the design of conventional Fund programs and the choice of program targets need to be adapted to CBAs.

6. This paper draws extensively on the detailed background information on CBAs and case-by-case performance assessments provided in the companion paper, Experiences with Currency Board Arrangements, EBS/96/XX.

## II. DEFINITIONS AND BASIC FEATURES

### A. What is a CBA?

7. A currency board may be seen as a special case of a rules-based monetary system. Analogously to other spheres of economic decision-making, a system based on rules rather than discretion serves to establish credibility and avoids losses resulting from decisions—for example, decisions being undertaken within a myopic timescale.<sup>5</sup>

8. In its simplest form, a CBA can be defined as a monetary regime based on an explicit legislative commitment to exchange domestic currency for a specified foreign currency at a fixed exchange rate,<sup>6</sup> combined with restrictions on the issuing authority—the Currency

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<sup>3</sup>(...continued)

that are reviewed in the companion paper "Experiences with Currency Board Arrangements," SM/96/XX, which also includes a full list of existing CBAs.

<sup>4</sup>For the purpose of this paper, a country is defined as an entity that has its own monetary arrangement.

<sup>5</sup>For discussion of this subject, see Guitián (1992) and (1994).

<sup>6</sup>In principle, a CBA could involve a peg to a basket of currencies, for instance, those of a country's trading partners, to minimize real exchange rate fluctuations. In practice, however, all CBAs have specified a single foreign currency in their exchange commitment, probably to assure transparency and simplicity.

Board—to ensure the fulfillment of its legal obligation.<sup>7</sup> This structure implies that domestic currency be issued only against foreign exchange and that it remain fully backed by foreign assets. Thus it eliminates traditional central bank functions such as monetary regulation and LLR; such a CBA is defined in this paper as a "pure CBA."

9. Viewed from the perspective of today's almost universal use of fiat money, the restrictions on currency issuance and the reserve backing rule of pure CBAs appear quite stringent. In practice, almost every country that has established a CBA has introduced modifications to reflect local factors. For instance, in Argentina, Brunei Darussalam and the Eastern Caribbean Central Bank (ECCB), the minimum foreign reserve coverage is less than 100 percent of the monetary base, thereby allowing the CBA to extend a limited amount of credit against its monetary liabilities. Other CBAs, such as Hong Kong, maintain foreign reserves in excess of what is needed to back the monetary aggregate covered by the arrangement.<sup>8</sup> Such foreign exchange reserves can be used to conduct monetary operations or to provide LLR support.

10. Even though CBAs do not require a full-fledged central bank for their operation, the currency boards of Argentina, Estonia, and Lithuania were established in institutional frameworks encompassing an existing central bank, which retained some or all of its traditional functions. In Estonia, for example, the Bank of Estonia (BOE) is comprised of the Issue Department (the Currency Board proper), which holds the foreign exchange reserves that back up the currency, and the Banking Department (the policy and supervisory side of the Bank) which holds the excess foreign reserves, undertakes monetary operations, and exercises bank supervision. Similarly, the Argentine and Lithuanian CBAs retain many traditional central bank functions, including settlement of payments system transactions. Argentina and Hong Kong conduct daily monetary operations; Argentina, Estonia, and Lithuania have provided, in times of stress, significant last-resort support to the banking system.

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<sup>7</sup>Currency boards were introduced in the British colonies in the 19th century to economize on specie transport costs and to let local governments benefit from seignorage. The first currency board was introduced in Mauritius in 1849, based on the ideas of the Currency School. In the words of Earl Grey, the British Secretary of State for the Colonies, who is cited in Gunasekera (1962), currency boards were designed to "unite the advantages of cheapness and convenience of paper currency with the steadiness and uniformity of value of a metallic currency;...thus, they ought to be so regulated that the amount in circulation should vary according to the laws which govern the latter." Currency boards became public note-issuing institutions, following the failure of several private note-issuing banks.

<sup>8</sup>In this regard it may be easier to introduce a CBA in a country where the banking system is relatively small, since this makes it easier to back the monetary base. For instance, in Argentina, the ratio of M2 to GDP at the time the CBA was introduced was 6.2 percent.

## **B. What Distinguishes a CBA From Other Pegged Exchange Rate Arrangements?**

11. Currency board arrangements are a special form of pegged exchange rate arrangements. They differ from conventional pegs in the restrictions they set on the level of the exchange rate, and most importantly on the sources of reserve money creation. The first essential characteristic of a CBA is the existence of a well-publicized legal barrier to changing the exchange rate, and attendant legal restrictions on the use of other policy tools. That the exchange rate can only be changed with great difficulty adds to the CBA's credibility. In addition, the backing rule eliminates (or strictly limits, when less than one hundred percent of the base is backed) the scope for issuing unbacked monetary liabilities, hence ensuring that the CBA does not run out of foreign reserves to maintain the parity. While the central bank may still give credit to banks (or governments), it can only do so if it holds foreign reserves in excess of what is needed to back the monetary base.

12. To these well specified and mutually reinforcing rules, it is necessary to add a third "unwritten" but equally important rule. While large excess foreign reserves can strengthen a CBA, these reserves must be used in a way that clearly subordinates concerns over monetary and banking sector developments to the objective of preserving the parity.<sup>9</sup> CBAs face trade offs between rules and discretion that are not unlike those of a conventional central bank, and, hence, their credibility depends on attitudes as much as on rules and institutions.

13. CBAs are not of course the only arrangements that involve formal restrictions on discretionary monetary policy or a strong commitment to maintain an exchange rate parity. In particular, currency unions severely restrict monetary financing of fiscal deficits: this is the case not only of existing currency unions, such as the countries of the East Caribbean Currency Board and the CFA franc zone, but also the prospective European Monetary Union. Also in the late 1970s, countries in the southern cone of Latin America adopted exchange rate regimes based on a pre-announced devaluation schedule as part of a policy package that implied restrictions on monetary financing.

## **C. How Do CBAs Function?**

14. Under a CBA, reserve money issue follows similar rules to those of a gold standard. With only a limited margin for central bank policy discretion, changes in money demand are accommodated by endogenously determined changes in international reserves, rather than by

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<sup>9</sup>Obstfeld and Rogoff (1995) argue that the main reason central banks break commitments to fixed exchange rates is not that they exhaust their reserves and draw down all available credit lines but because their respective governments are unwilling to accept the consequences of continuing to defend the exchange rate. In particular, they cite the unwillingness of the Swedish and U.K. authorities to accept a prolonged period of high interest rates to maintain the peg to the ECU in 1992.

changes in the central bank's net domestic assets (NDA).<sup>10</sup> Thus, reserve money varies in close relation to the level of official international reserves and interest rates are determined—mostly or totally—by local market adjustments to monetary conditions prevailing in the reserve currency country. Even so, under a CBA there will always remain a possibility, no matter how small, that the arrangement could be changed, and this will build a risk premium into domestic interest rates. Also, there may be instances where the CBA comes under attack and interest rates will need to be raised sharply—as occurred in Argentina in early 1995.

15. Interest rates play a major role in facilitating adjustment. In economies with open capital accounts, capital flows tend to reduce monetary disequilibria and facilitate the approximation of local interest rates to those in the reserve currency country. Also, by allowing banks to borrow abroad in case of need, they reduce the need for a domestic lender of last resort. While this mechanism applies to all fixed pegs, in CBAs it is stimulated by the containment of exchange rate risk, which facilitates arbitrage. In addition, free capital mobility improves the efficiency of CBAs' monetary adjustment mechanism and enhances the potential for rapid trade and financial integration. When capital controls or limited financial development restricts capital mobility, the adjustment takes place more gradually through changes in absorption and adjustments of the trade account. However, as is also the case in any fixed exchange rate regime, it has to be recognized that capital mobility can on occasion add to the problems of operating a CBA—for instance, the persistent capital inflows into Estonia after the initial stabilization, and capital outflows from Argentina in 1995. Some CBAs, including Estonia's (until 1993) and the ECCBs', have operated or continue to operate with capital controls. Conceivably, in some cases, existing capital controls could serve a useful purpose to limit capital flows during a transitional phase, as when financial liberalization is incomplete, or when CBAs are introduced in an economy with unsound vulnerable banks (or weak bank supervision).

### III. CONSIDERATIONS FOR ADOPTING A CURRENCY BOARD

16. CBAs may appear attractive to small open economies with limited central banking expertise and incipient financial markets, or to countries that wish to preserve the benefits of belonging to a broader trade or currency area, or envisage joining a currency union. In addition, CBAs may be attractive to countries where lack of credibility severely constrains the effectiveness of monetary policy or exposes the economy to recurrent currency crises and high risk premia. However, a CBA cannot of itself create credibility unless accompanied by firm supporting policies. In the absence of such policies, credibility will remain low, which will undermine the sustainability of the CBA itself.

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<sup>10</sup>However, by changing reserve requirements central banks have a limited scope to change the supply of money without changing the monetary base.

### **A. CBA Strengths**

17. CBAs' strengths accrue from their simplicity and the limited discretion of their operating rules. These rules eliminate or sharply limit the scope for discretion in monetary and foreign exchange rate policies, and thereby enhance the credibility of conventional fixed pegs and simplify central bank operations. They can be particularly helpful in cases where despite a strong political commitment to financial discipline the political process is unlikely to give the central bank a high degree of independence.

#### **Administrative and operational simplicity**

18. The extreme simplicity and transparency of CBAs is appealing. CBA operating rules are easily understood and monitored by the general public, if appropriate information is provided. Pegging the exchange rate simplifies the operation and monitoring of the foreign exchange market. The delegation of central bank functions, such as payments system and fiscal agent functions, can sharply reduce the need for staff and bookkeeping activities at the central bank.

19. For such reasons, a CBA is particularly attractive for post-chaos countries—such as Bosnia and Herzegovina—or for small countries that have recently attained independence and that wish to have their own currency for motives of seignorage as well as national identity.<sup>11</sup>

#### **Credibility of sound monetary and fiscal policies**

20. CBAs have been used in recent years to strengthen the credibility of exchange rate-based disinflation policies in Argentina, Estonia, and Lithuania. By eliminating or strictly limiting the monetary authorities' ability to monetize fiscal deficits, or lend to banks, CBAs can rapidly strengthen credibility. In principle, CBAs would be expected to be more effective than conventional fixed pegs when the monetary authorities' reputation has been weakened by a history of lax fiscal policy, accommodative monetary policy, and failed stabilization attempts (as was the case of Argentina), or when the authorities lack an established track record (as in Estonia and Lithuania). By providing clear signals about the policy intentions of the authorities, and ensuring monetary independence from the government, CBAs facilitate an adjustment of expectations and promote wage and price discipline, thereby lessening potential inflation biases.

21. CBAs appear to have made a strong contribution to stabilization programs in Argentina, Estonia, and Lithuania.<sup>12 13</sup> In all cases, CBAs clearly played a central role in

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<sup>11</sup>See Collins (1983).

<sup>12</sup>For further details of the effect of CBAs on macroeconomic performance, see Chapter IV of  
(continued...)

securing monetary discipline. They ensured that changes in the demand for base money, after the exchange rate was pegged, were met by changes in foreign assets rather than domestic assets, thereby strengthening the credibility and sustainability of stabilization efforts. It should be noted, however, that while the CBA contributed in an important way to enforcing fiscal discipline in Argentina (at the federal level), the case is less clear in the Baltics.

22. The CBA countries mentioned above experienced strong economic recoveries after the stabilization periods. Lower interest costs contributed to these recoveries, as interest rates in CBA countries converged quickly to international levels. Furthermore, CBA's credibility has also attracted large capital inflows (as in Argentina, Estonia, and Hong Kong). The record in keeping inflation low has been mixed. In Argentina inflation was brought down to low levels, and has remained low. In the Baltic countries and Hong Kong, on the other hand, inflation has remained moderate but higher than in their trading partners owing to the CBAs' nominal exchange rate rigidity, which prevented productivity gains from leading to an appreciation of the exchange rate.

### **Currency stability**

23. CBAs are less prone to policy reversals than conventional fixed pegs. In particular, in an era of high and growing capital mobility, CBAs are perceived to be less vulnerable to destabilizing capital outflows and self-fulfilling currency crises.<sup>14</sup> Due to the higher credibility, interest rates should converge rapidly to levels in the reserve currency country and remain close to international levels.<sup>15</sup> In addition to lowering the risk premium in interest rates, the containment of exchange rate uncertainty and the maintenance of orderly monetary conditions

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<sup>12</sup>(...continued)  
the supplement paper.

<sup>13</sup>Saavalainen (1995) finds no clear evidence that disinflation was achieved faster in Estonia and Lithuania than under a monetary rule and later a conventional fixed peg in Latvia. In Argentina, the introduction of the CBA in early 1991 helped to consolidate the downward path of inflation, and avoid a recurrence of the hyper-inflation conditions experienced in the first quarter of 1990, caused by a flight from domestic currency denominated financial assets. It should be noted, however, that in all three cases the introduction of a CBA was preceded by significant exchange rate depreciation, the pass-through of which is likely to have delayed the deceleration of inflation.

<sup>14</sup>Recent discussions of self-fulfilling currency attacks can be found in Obstfeld (1994 and 1995), Eichengreen, Rose, and Wyplosz (1994), Drazen and Masson (1994), and Davies and Vines (1995).

<sup>15</sup>However, bank rates (particularly lending rates) could remain above comparable rates in the reserve currency country, due to credit risk or inefficient or unsound banks.

should also help promote, in the longer run, international trade and facilitate access to international capital markets.<sup>16</sup>

24. Experience with CBAs generally substantiate these expected benefits. Indeed, the resilience of CBAs contrasts sharply with that of conventional fixed pegs, possibly because the introduction of a CBA provides greater impetus for a strengthening of policies overall.<sup>17</sup> With the possible exception of earlier Argentine experiences with CBAs in the early part of this century, there are no other examples of CBAs being abandoned under stress, although as noted earlier, in some cases CBA arrangements were modified in response to pressures.<sup>18</sup> The experience of colonial CBAs is only partially relevant to current CBAs, due to the lack of fiscal autonomy, limited capital mobility, and the preponderance of foreign banks in the financial systems of these countries. However, it is still important to note that they functioned adequately during long periods, notwithstanding large fluctuations in the terms of trade.<sup>19</sup> Since the introduction of its currency board in 1983, Hong Kong has been exposed to only two short-lived attacks on its currency, notwithstanding the uncertainties related to the process of reunification with mainland China. Similarly, Argentina's current CBA has been put to the test only twice since it was introduced, and it survived successfully the aftermath of the Mexican crisis. The Baltic CBAs have also withstood speculative attacks.<sup>20</sup> In the cases of

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<sup>16</sup>Similar credibility benefits are reported for countries that adhered to strict gold standard rules during the period 1870-1914. Countries with poor adherence records were charged considerably higher rates on long-term government bonds, even when denominated in gold, than those with good records (see Bordo and Rockoff (1995)).

<sup>17</sup>Klein and Marion (1994) study a sample of 61 pegged exchange rates in Latin America since the 1950s and find that they had a mean duration of 32 months and a median of 10 months. Although the short average duration also reflects the greater capacity of conventional pegs to respond to exchange rate misalignments, it suggests that pegged exchange rates are not expected to last and, hence, are prone to attacks.

<sup>18</sup>Even in the cases of the early Argentina CBAs, however, the currency boards were abandoned partly as a result of a conscious policy choice by the monetary authorities.

<sup>19</sup>Colonial CBAs were replaced by central banks out of a concern for autonomy and modernity, rather than as a result of clearly identified shortcomings. As cited by Gunasekera (1962), the speech by Ceylon's Finance Minister in 1949 reflects well the prevailing mood of the times: "...with the advent of freedom...and the changes taking place around us, it is quite clear that the whole outworn and outmoded system must give way to something more modern."

<sup>20</sup>The Lithuanian CBA came under severe attack at the end of 1994 and beginning of 1995, following rumors of an impending devaluation and incipient banking system difficulties. The

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Argentina and Estonia, the performance of CBAs in lowering interest rates was indeed superior to that of countries such as Mexico and Latvia, which faced somewhat similar economic environments but had different currency and exchange rate arrangements.<sup>21</sup> Similar evidence exists for Ireland, which operated a CBA during the period 1928-1971.<sup>22</sup> Also Argentina's experience in 1978-81 with a preannounced devaluation path produced a much less rapid and significant interest rate convergence than has been the case under the CBA. During that period, money market and deposit rates remained high and only started to decline along with inflation in the last quarter of 1979. Interest rates increased sharply after a banking crisis started in the second quarter of 1980.

## B. CBA Weaknesses

25. CBAs' weaknesses are the flip side of their strengths. While the commitment to preserve the parity is an asset in times of currency instability, it can become a liability in the presence of large exchange rate misalignments. This risk can be particularly serious in cases where it is difficult to have any firm idea as to what the appropriate exchange rate should be (such as in a post-chaos economy). While the market may be no more successful than the authorities at initially setting the exchange rate at an appropriate level, a flexible exchange rate regime would enable early errors to be corrected without incurring the costs of loss of credibility. Similarly, a rigid backing rule can increase the financial sector's vulnerability to crises. Operational simplicity also comes at a cost, in that it may rule out the exercise of what would be viewed in other countries as important central bank functions. In addition, by removing the possibility of monetary financing of the fiscal deficit CBAs require a level of immediate fiscal consolidation that may be difficult to attain.

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<sup>20</sup>(...continued)

attack appeared to have been encouraged by a weak institutional commitment to defend the parity.

<sup>21</sup>In Lithuania, interest rates remained high after the introduction of the CBA, due to the persistent expectations of devaluation. See Camard (1996).

<sup>22</sup>After Ireland joined the EMS in 1979, average interest rates on Irish pound denominated assets substantially exceeded those in deutschemarks, due to the possibility of realignments within the EMS. In contrast, during 1928-1971, when a CBA was in operation based on the pound sterling, interest rates in Ireland closely approximated those in the U.K. It should be noted though that the Irish economy was much more closely linked to that of the U.K. than to those of other EMS members. See Honohan (1994).

### **Nominal exchange rate rigidity**

26. Most exchange rate-based stabilization programs have experienced post-stabilization booms and some degree of real exchange rate overvaluation.<sup>23</sup> However, as devaluing in a CBA or abandoning the arrangement entails a substantial loss of credibility, exchange rate misalignments are a more serious cause for concern when CBAs are used as part of a stabilization program. Correction of a real exchange rate misalignment in a CBA could require a prolonged period of tight liquidity and high unemployment that could cast doubts on the CBAs' sustainability. Owing to limited price arbitrage, countries with substantial nontradable sectors are particularly vulnerable. This probably explains why most CBAs, with the notable exception of Argentina, have been established in small open economies.

27. In Argentina, Estonia, and Lithuania, the real exchange rate appreciation following the CBA's introduction was indeed substantial, as inflation, albeit declining, continued to be higher than in their main trading partners. However, it is unclear whether significant losses of competitiveness have occurred, as residual inflation may have been mainly associated with initially undervalued exchange rates or a systematic "productivity bias."<sup>24</sup> The latter interpretation has been used to explain recent inflation in the Baltics, as well as the persistently high inflation rate in Hong Kong.<sup>25</sup> In any event, inflationary biases—but not necessarily a real appreciation—might have been avoided with a more flexible exchange rate policy that would have allowed for nominal appreciation. Thus, Singapore has had a significantly better inflation record than Hong Kong since it exited its CBA, due to the substantial nominal appreciation of the Singapore dollar against the U.S. dollar.

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<sup>23</sup>See Rodríguez (1982), Kiguel and Liviatan (1992), and Rebelo and Végh (1995).

<sup>24</sup>Productivity biases result from differential productivity growth. With nominal exchange rate rigidity, productivity growth in the tradable sector results (when higher than abroad) in wage increases which are transmitted to the nontradable sector. If productivity in the nontradable sector grows less rapidly, wage increases cause nontradable prices to increase. This is known as the "Balassa/Samuelson effect." Similar dynamics may occur as a result of increased competitiveness in the most dynamic sectors of the economy.

<sup>25</sup>Saavalainen (1995) and Richards and Tersman (1995) suggest that productivity biases, together with initial undervaluation, account for most of the price increases in the Estonian and Lithuanian CBAs. Halpern and Wyplosz (1994) find substantial support for the hypotheses of initial undervaluation and subsequent equilibrium appreciation in a sample of Eastern European economies in transition. Productivity developments may also have played an important role in Hong Kong, as suggested in a recent document prepared by the Hong Kong Monetary Authority (1995). Arguably, however, in the Baltics the shortness of the time period involved suggests that the high levels of inflation may have been due more to the price convergence process than to the differential productivity effect.

28. As frequently observed in exchange rate-based stabilizations, capital inflows initially delayed the lowering of inflation in most of the recently established CBAs, including Argentina and Estonia. While CBAs' rule-based environment may attract more long-term capital than conventional pegs, capital inflows can nevertheless also contribute to a rapid credit expansion and a consequent decline in credit quality. The rigid exchange rate rule, which prevents an early exchange rate correction, and the perception that CBAs guarantee macroeconomic stability, which could exacerbate inflows, may increase CBAs' vulnerability to such problems, compared to conventional pegs.<sup>26</sup>

29. As with conventional pegs, fixing the exchange rate firmly to the reserve currency can also imply important costs when the economy is subject to shocks or when the value of the reserve currency changes in relation to the currencies of other trading partners.<sup>27</sup> In particular, changes in monetary conditions in the reserve currency country may be inopportune to the CBA country if the business cycles of the two countries do not coincide.<sup>28</sup> For example, Hong Kong's inflation during the early 1990s was partly the result of low nominal interest rates imported from the U.S. at a time when a rapid economic expansion (driven by China's business cycle) and an asset price boom would have called for higher rates. In addition, a weakening (strengthening) of the reserve currency can impart a significant inflationary (deflationary) bias if it leads to a depreciation (appreciation) of the CBA country's currency vis-à-vis the currencies of its other trading partners. Thus, the depreciation of the pound sterling against the U.S. dollar helps explain Singapore's 1972 decision to abandon the pound sterling as reserve currency and to switch, shortly thereafter, from a CBA to a managed float. Countries with limited trade relations with the reserve currency country are particularly exposed to such shocks. In the case of Djibouti, for example, which pegs its currency to the US dollar while transacting mainly with France and other EU countries, fluctuations in the value of the French franc in relation to the US dollar have led to wide fluctuations in inflation and competitiveness.

### **Financial fragility**

30. CBAs are required to have sufficient foreign reserves to ensure the convertibility of their monetary obligations. Moreover, as pointed out above, CBAs help discourage systemic runs on banks motivated by expectations of an exchange rate realignment. Nevertheless, the vulnerability of the banking system to incipient runs, when they occur, can increase in CBAs

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<sup>26</sup>The issue of banking crises in CBAs is addressed below.

<sup>27</sup>The familiar optimum currency area conditions apply. See Mundell (1961) and McKinnon (1963).

<sup>28</sup>However, in any event, capital mobility has reduced the scope for differential cyclical policy positions.

that do not provide LLR.<sup>29</sup> These risks are particularly important in countries where capital mobility is high but banks have limited access to foreign funds, such as Argentina, or in countries with weak banking systems, such as Estonia and Lithuania.<sup>30</sup>

31. In a CBA, banks may be hard pressed to honor requests for withdrawals of deposits if they are unable to obtain short-term financing from the central bank. While selling liquid domestic assets—such as government securities—may provide liquidity to individual banks, it cannot solve a systemic crisis as such sales do not increase the amount of reserve money, unless those instruments can be sold abroad or can be rediscounted by the monetary authorities. However, pure CBAs prohibit such rediscounts.

32. Interest rate increases may subject banks (and borrowers) to excessive stress and damage credibility about the sustainability of the arrangement over time. Although the containment of exchange rate uncertainty in CBAs helps moderate interest rate increases, relative to conventional pegs, the recent Argentine and Lithuanian experiences suggest that some interest rates (particularly long-term bank deposit and lending rates) can reach very high levels for significant periods of time, due to expectations of a banking system crisis or a collapse of the CBA. Weak bank supervision and unsound banks increase the banking system's vulnerability to such systemic perturbations.<sup>31</sup>

33. As in the case of bank runs and for similar reasons, CBAs, like any fixed rate arrangement, may be vulnerable to bond-led speculative attacks if there is a large outstanding stock of short-term government debt, even if the current fiscal deficit is sustainable. Thus, in addition to exposing the government to a debt crisis, failure to sustain the securities market

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<sup>29</sup>The vulnerability of financial systems to a credit crunch associated with a loss of gold reserves in the presence of a specie standard is emphasized by Stoker (1994) in a recent study of English financial crises during the 1800s. Bordo and Kydland (1990) report that the adoption of Bagehot's rule—in the face of both an external and an internal drain, "to lend freely but at a penalty rate"—was a key determinant in ending financial crises in British financial history.

<sup>30</sup>CBAs that operate in a financial system dominated by subsidiaries of foreign banks, as was the case of colonial CBAs, are less prone to banking crises caused by liquidity shortages, as those subsidiaries generally have broader access to foreign funds from their parent institution in an emergency. The absence of LLR places domestic banks at a disadvantage. In Djibouti, for example, lack of LLR support contributed to the early failure of domestic banks. While the early weeding out of potentially unsound banks may be beneficial, the risks incurred in failing to support already well established domestic banks may be too large to be ignored.

<sup>31</sup>Experience shows that liquidity crises are often rooted in solvency problems. See "Macroeconomic Consequences and Causes of Bank Unsoundness," SM/96/40 Supplement 1.

could also contribute to banking or payments system crises when government debt forms an important component of the economy's liquidity.<sup>32</sup>

### **Loss of central bank functions**

#### ***Monetary management***

34. Experience suggests that capital flows and interest rate arbitrage may not perfectly substitute for central bank liquidity management.<sup>33</sup> Thus, CBAs that abstain from performing monetary operations and rely instead totally on capital flows to regulate liquidity may subject the economy to unnecessary fluctuations. Interest rate arbitrage is limited in the short run, owing to transaction costs, credit risk, market imperfections, and possibly a lack of full credibility in the survival of the CBA. By increasing interest rate volatility, the failure to absorb day-to-day liquidity mismatches can increase intermediation spreads and penalize financial transactions.<sup>34</sup> In addition, the CBA's automatic adjustment mechanism may fail to act with sufficient speed to prevent temporary monetary imbalances from affecting the economy.

35. While capital account transactions were fully liberalized and domestic interest rates followed the LIBOR rate on an average basis in Argentina and Hong Kong, capital flows were unable to fully arbitrage interest rates on a daily basis. Thus, short-term liquidity imbalances were perceived to be detrimental to financial and exchange markets. As a result, both countries were led to develop (or maintain) their capacity to engage actively in open market operations (OMOs) and other day-to-day monetary operations.<sup>35</sup>

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<sup>32</sup>See Calvo and Mendoza (1995) and Sachs, Tornell and Velasco (1995).

<sup>33</sup>Most monetary operations undertaken by developed country central banks are "defensive" in nature. In particular, offsetting the impact of government operations on domestic liquidity accounts for a sizeable portion of these operations. While, in most CBAs, government deposits were transferred from the central bank to the commercial banking system, treasury operations may continue to cause monetary perturbations, particularly if interbank markets are not well developed.

<sup>34</sup>In particular, interest rate volatility increases intermediation margins of highly leveraged financial intermediaries with rapid turnovers, such as bond dealers. This reduces the liquidity of government securities and other money market instruments. Empirical evidence linking interest rate volatility to intermediation spreads can be found in Ho and Saunders (1981).

<sup>35</sup>In Hong Kong, the monetary authorities issue bills that are used for OMOs, mostly to limit the deviations of the domestic interest rate from the U.S. Federal Funds rate. In Argentina, the Central Bank has some limited influence on short-term domestic interest rates through

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36. Having some scope for monetary operations has been helpful in a number of circumstances. In particular, as illustrated by recent events in Argentina, such operations can moderate increases in interest rates in the case of systemic outflows. Sterilization can also limit the adverse effects of capital inflows when these are inflationary and temporary, or mop up excess liquidity injections resulting from LLR operations.

### ***Payments***

37. In cases where CBAs do not provide banks the opportunity to settle in the books of the central bank, some problems can emerge. In particular, it raises the risk of settlement failures, especially if the CBA is unable to provide LLR services. However, mechanisms can be designed to minimize that risk. For instance, in Hong Kong, banks settle on the books of a commercial bank, but the clearing bank has to hold a compensating balance with the Hong Kong Monetary Authority.

38. Furthermore, not settling in the books of the central bank may complicate monetary management. For instance, in Hong Kong, although bank reserves are used to settle financial transactions, the Hong Kong CBA does not guarantee the convertibility of bank reserves at the official rate. Rather it guarantees the convertibility of cash at the official rate. But as cash is an ineffective medium to arbitrage rates in the exchange market, the market exchange rate can in principle deviate from the official exchange rate and monetary interventions are needed to reduce foreign exchange and interest rate volatility.<sup>36</sup>

### **Constraints on fiscal policy**

39. CBAs promote but do not guarantee fiscal discipline. Although the fiscal performance of CBA countries has generally been satisfactory, large fiscal deficits were financed in some cases through an accumulation of public debt and payment arrears.<sup>37</sup> A debt crisis could induce the authorities to abandon their commitment to defend the parity. In extreme cases, chaotic fiscal or monetary conditions can occur when CBAs are established in a context of lax

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<sup>35</sup>(...continued)

repos and reverse repo operations, undertaken mostly with dollar-denominated public securities.

<sup>36</sup>Thus, spreads between the market exchange rate and the official exchange rate are much smaller in Argentina than in Hong Kong. See Bennett (1994).

<sup>37</sup>For instance, the Djibouti Government and some ECCB member governments accumulated large payment arrears.

fiscal discipline.<sup>38</sup> In some cases, treasury IOUs have become an alternative currency that has circulated, at a discount, alongside the official currency.<sup>39</sup>

40. While CBAs share with all fixed pegs the need for sound public finances, their limited capacity to accommodate fluctuations in treasury cash flows can put an additional burden on public finances. To cope with this problem, the market for short-term treasury bills may be developed, but this takes time and could undermine the CBA's inherent incentives for fiscal discipline, unless subject to strict limits on outstanding amounts.

41. In view of these risks and of the lack of discretion in exchange rate and monetary management, fiscal policy acquires particular importance in CBAs. For instance, insofar as the authorities wish to dampen the business cycle, reliance will have to be placed on fiscal policy. In addition, fiscal policy can be used to help restore confidence in the case of an incipient debt crisis, as in the case where Argentina reduced its structural fiscal deficit in the aftermath of the Mexican crisis. Systematic fiscal surpluses can be used to limit the country's dependence on foreign savings and build up its international reserves position, as in Hong Kong.<sup>40</sup> Thus, fiscal strength and (when needed) fiscal reforms are as much a precondition for establishing CBAs as they are an operational constraint in this environment.

### C. Implications of Strengths and Weaknesses for Entry Conditions

42. This section has identified key weaknesses and strengths of CBAs. These have implications for the conditions for entry into a CBA. In particular, strong macroeconomic policies are crucial for the establishment and sustainability of a CBA. A CBA's key function is to enhance policy credibility, but credibility cannot be maintained—nor the CBA sustained—in the absence of fiscal discipline.

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<sup>38</sup>Although Liberia's use of the U.S. dollar as legal tender does not qualify as a CBA, it provides an interesting illustration of the sort of chaotic financial and fiscal conditions that may develop as a result of financing large fiscal deficits with IOUs and pledging future tax revenues to secure commercial bank advances.

<sup>39</sup>For example, the restrictions imposed by the Convertibility Law in Argentina on deficit financing drastically curtailed the possibility of the central government to assist provincial governments. In reaction, with the slowdown in economic activity, in the aftermath of the Mexican crisis, some provincial governments issued promissory notes during 1995 that circulated locally as a means of payment at a discount. See "Tucumán's Monopoly Wages," *Financial Times*, 2/13/96. Of course, significant fiscal tightening could have triggered a similar reaction under a different monetary arrangement.

<sup>40</sup>Similarly, in principle governments can run up their deposits in the banking system to be able to withstand seasonal fluctuations in cash flows.

43. In turn, a strong fiscal position can contribute to the accumulation of foreign reserves, which is also crucial to enhance the credibility of the arrangement and reduce the likelihood of attacks. The close integration with capital markets that CBAs entail make them particularly vulnerable to shocks from abroad. Excess foreign reserves coverage will let the public know that the CBA can withstand such shocks.<sup>41</sup>

44. Policies that encourage sound banking are also important for the success of a CBA. A failure of banks to convert deposits into cash would put strong pressure on the authorities to provide liquidity support to banks, which may undermine the CBA. In addition, the capacity of the CBA to withstand shocks depends upon banks' ability to withstand large fluctuations in interest rates. Moreover, knowledge of the constraints a CBA puts on the LLR function of central banks could increase the potential for a run. Thus, a weak banking system could encourage attacks against the CBA.

45. Flexible labor and goods markets also can help to avoid an exchange rate misalignment that could bring about undesirable real effects (e.g., an increase in unemployment) and fuel demands for an abandonment of the regime. In this connection, choice of an appropriate initial exchange rate also helps, as discussed below. Finally, other factors—over which the authorities have little control—can affect the suitability of a CBA, such as the economy's openness vis-à-vis the rest of the world, its propensity to external shocks, and a history of disappointment with other policy alternatives.

46. Clearly, not all the conditions above are likely to exist at the time a CBA is set up. However, a sound fiscal policy, a sufficient level of reserves to honor the conversion commitment, and a fairly sound banking system should be in place or be part of the policy package adopted when a CBA is established. Others, such as strong prudential supervision and flexible labor laws, are also desirable and if absent, they need to be implemented and strengthened, as rapidly as possible.

#### **D. Determination of the Exchange Rate**

47. Two important and interrelated issues for the establishment of a CBA are the level of the exchange rate and the size of the backing. Clearly, if the rate obtaining when contemplating the move to the CBA has been kept overvalued through administrative measures, it will need to be devalued to at least a level that reflects market forces. What is more difficult is whether depreciation beyond a rough market clearing rate should be sought, either to reduce the required foreign reserve backing or to build in a cushion for any ensuing real exchange rate appreciation.

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<sup>41</sup>For evidence that a high ratio of foreign reserves to broad money can help in avoiding self-fulfilling bank panics and attacks on the exchange rate, see Calvo and Mendoza (1995), Kaminsky and Reinhart (1996) and Sachs, Tornell, and Velasco (1996).

48. In establishing the initial exchange rate, the authorities should take into account inflation inertia and the likely price effect of devaluation and of other concomitant measures adopted, such as price liberalization. However, to knowingly build in a margin for sustained inflation could jeopardize the credibility of the arrangement. While some allowance for inflation inertia and structural rigidities could be allowed, a consistent plan to address these rigidities must be in place to engender credibility in the permanence of the arrangement. It should not, therefore, be necessary to build in more than a small margin.<sup>42</sup>

49. The second motivation for over depreciation would be simply to increase the foreign exchange backing to the currency. However, if the current exchange rate is roughly in equilibrium, a devaluation could readily provide an impulse to domestic price inflation that would reestablish the previous real exchange rate—an inauspicious way to introduce the new regime. An alternative would be to allow the CBA to build up its reserve cover gradually or to borrow the reserves through a medium- or long-term foreign loan. If underlying policies are strong, a commitment to build up full reserve cover may have sufficient credibility to establish an effective regime. Argentina followed such a course when it established its CBA. Nevertheless, the credibility resulting from the currency board, per se, as opposed to the constellation of supporting policies, is lessened to the extent that less than full coverage is provided.<sup>43</sup>

#### IV. THE SCOPE FOR MONETARY POLICY AND LLR SUPPORT

50. While large foreign reserves holdings can strengthen a CBA, the active use of these reserves for LLR or monetary operations could be seen as conflicting with the CBA's basic principles of limited discretion. It seems more likely, however, that as long as sufficient resources are available and that the authorities' actions follow clearly specified rules, some flexibility can add to the sustainability of a currency board and thus enhance its credibility. Institutional arrangements, operational procedures and monetary and prudential instruments can be designed to reduce risks of a systemic liquidity crisis while limiting discretionary

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<sup>42</sup>In the case where the exchange rate is initially undervalued and is expected to appreciate, there would be merit in setting the rate for the CBA above the current market rate, to avoid inflation becoming the mechanism to achieve the required real appreciation.

<sup>43</sup>The degree of backing has been a longstanding matter of debate. As cited by Gunasekera (1962), opponents of CBAs already argued in 1948 that "a 100 percent reserve system increases unnecessarily the cost of currency in that a foreign reserve has to be maintained even against the hard core of circulation which will never be offered to the Currency Board for redemption." Bordo and Kydland (1990) report that on at least three occasions, during the financial crises of 1847, 1857, and 1866, the Bank of England resorted to special unbacked note issues without suspending convertibility of its notes into gold. The policy was successful in alleviating the pressure on reserves and the Bank retired the excess issue shortly thereafter.

interference from the monetary authorities. In addition, public debt policies can be reformed to limit the risk of a debt crisis. Nevertheless, some LLR support is needed—preferably under central bank control—to contain financial sector problems at an early stage and avert contagion risks. This should be done in a manner that addresses systemic problems in the banking system, while seeking to avoid bailouts of insolvent banks. Indeed, the existence of such support facilities can enhance confidence in the domestic financial system, and hence lower intermediation spreads. To build up reserves to provide such support, CBAs may wish to set higher reserve requirements.<sup>44</sup> CBAs can also assume traditional monetary functions, within clearly specified bounds, provided they have sufficient credibility and hold adequate excess reserves.

#### **A. The Scope for Day-to-Day Monetary Operations**

51. Payments system and monetary arrangements can help in dealing with the limitations on the scope of monetary operations that a CBA imposes. In particular, allowing banks to hold their settlement balances with the monetary authority and ensuring their immediate convertibility at the official exchange rate facilitate the adjustment of liquidity through capital inflows.

52. Automatic access to central bank liquidity can also be facilitated through the use of reserve requirements (RR), as introduced in a number of CBA countries.<sup>45</sup> When required reserves are averaged over a sufficiently long holding period, they can be accessed by banks as an automatic liquidity buffer to help smooth out interest rate volatility in the money market and limit risks of settlement failures. Thus, the foreign reserves that are held inside the currency board to back RR can continue to form an active part of the financial system's liquidity, and fluctuations in bank reserves can usefully complement capital flows, particularly over the shorter term.

53. RR also act to sterilize capital inflows, limit their impact on domestic credit and discourage their domestic intermediation.<sup>46</sup> The portion of RR which is used for sterilization

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<sup>44</sup>If the CBA is backing reserve money rather than only currency, such a build-up of reserve requirements would have to be matched by an increase in foreign exchange reserves, which reduces their usefulness as a source of LLR support.

<sup>45</sup>RR are used in many existing CBAs, including Estonia, Lithuania, the ECCB, and Brunei Darussalam. In Argentina, RR were recently replaced by liquidity requirements (LR) to be fulfilled with instruments that can be easily liquidated even in case of a systemic need for liquidity.

<sup>46</sup>In recent years, a number of observers have advocated the use of RR in developing economies to limit the expansionary impact of capital inflows and contain the risk of banking

purposes can be held in a fully backed separate sterilization fund. Thus, in the case of capital outflows, the foreign exchange can be made immediately available to banks.

54. To facilitate banks' use of their foreign reserves for domestic liquidity purposes, the central bank can also use foreign exchange swaps, as implemented, for example, in Argentina. Swaps facilitate short-term capital flows (thereby promoting interest rate arbitrage), and allow the central bank to provide fully backed liquidity without undermining its own foreign reserves base. However, as is the case in other fixed exchange rate arrangements, swaps can be dangerous if they are used to postpone needed policy actions, and costly if the currency peg needs to be changed.

55. In addition, a standing facility (such as a Lombard window) or conventional open market operations (OMOs) may also help to facilitate settlements, smooth out daily liquidity variations and accelerate the adjustment of domestic interest rates to changes in foreign rates. In particular, interventions may be used to maintain the spread between the domestic and the reserve currency country interest rates within a narrow band, as in Hong Kong. In addition, OMOs can be used to facilitate the development of government securities markets and to promote financial deepening.<sup>47</sup> In Estonia, for example, although the BOE does not attempt to influence the interest rate directly, it has in the past issued CDs to facilitate the development of the interbank market, and has stood ready to buy back its CDs (or to enter into repurchase agreements with banks) in order to ensure the liquidity of its bills.<sup>48</sup> However, to avoid undermining the CBA, these operations should have a clearly defined scope and should maintain the foreign exchange cover of monetary liabilities foreseen in the CBA.

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<sup>46</sup>(...continued)

crises. See Calvo, Leiderman and Reinhart (1992), Rodriguez (1993), McKinnon and Pill (1995), Gavin and Hausman (1995), and Kaminsky and Reinhart (1996). However, caution is needed in setting RR, particularly when unremunerated, as high RR can be detrimental to banks' soundness.

<sup>47</sup>When CBAs are established in a country in which a treasury bill market does not already exist, the development of such a market may be justified on several grounds: (i) to provide collateral, thereby facilitating the development of the interbank market; (ii) to accommodate the Treasury's cash flow requirements, thereby facilitating cash management; (iii) to increase the flexibility of bank interest rates, thereby enhancing the financial system's resilience to liquidity shocks; and (iv) to economize on the need for foreign reserves, as banks and other financial institutions can hold domestic securities, instead of foreign securities, to satisfy their need for liquidity.

<sup>48</sup>The BOE has now essentially abandoned this practice, and the stock of CDs has dwindled to very small amounts.

## B. Prudential Issues and LLR

56. While the case against having a LLR facility is often made by proponents of CBAs, its absence raises serious concerns. It can be argued that the absence of LLR should, in principle, enhance the soundness of the banking system by promoting market discipline, limiting moral hazard, and inducing banks to reduce their exposure. However, banks may fail to take sufficient measures to avoid liquidity crises, for instance in the case of adverse external shocks. In any case, banks continue to be exposed to some extent to moral hazard, as a systemic crisis may be expected to induce the authorities to come to their rescue in order to limit the damage to the payments system and to prevent a collapse of the CBA.<sup>49</sup> Argentina's recent experience, in which extensive official support was eventually provided to banks through a variety of channels, lends support to this view.<sup>50</sup>

57. The need for LLR support can be reduced by adopting proper prudential regulations and supervisory arrangements. Thus, strong bank supervision, proper accounting standards, loan valuation rules, stringent disclosure requirements, and risk management arrangements in the payments system should all be viewed as essential features of CBAs. In particular, capital adequacy rules should be more stringent than the minimum called for under the Basle standard. While a high required capital adequacy ratio may be costly to banks, it may, nonetheless, be needed to strengthen the banking system.<sup>51</sup>

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<sup>49</sup>Solutions, such as honoring only requests to transfer funds between institutions but not requests for conversion into cash, may be envisaged, as was done historically before the development of central bank LLR function. However, this may lead to payments disruptions and bank runs that will put the whole monetary setup, including the CBA, under strain. Although convertibility was frequently restricted in the case of bank panics during the gold standard era, as documented in Bordo and Kydland (1990), large scale restrictions on convertibility could be considerably more damaging in a modern payments system. In such cases there was a premium in the rate for cash over bank deposits. Also, as in the case of the Ruble area in the aftermath of the dissolution of the Soviet Union, a shadow exchange rate could emerge between cash and local bank deposits, and between local deposits and deposits abroad, thereby exacerbating expectations of an exchange rate adjustment.

<sup>50</sup>See Machinea (1996).

<sup>51</sup>The required capital-assets ratio was raised to 11.5 percent in Argentina. In Hong Kong, although the standard ratio is 8 percent, the Hong Kong Monetary Authorities can increase the risk-based capital adequacy standards up to 12 percent for any general licensed bank and up to 16 percent for other deposit taking institutions.

58. However, capital assets ratios need to be accompanied by additional prudential regulations to limit interest rate and liquidity risks, particularly when weak bank supervision allows bank owners to avoid acting as residual risk bearers.<sup>52</sup> To limit interest rate risk and promote interest rate flexibility, prudential regulations can be introduced that limit mismatches in the maturity structure of banks' assets and liabilities.<sup>53</sup> To increase the liquidity of the financial system and reduce its vulnerability to runs on deposits, banks may be subject to RR in excess of amounts strictly needed by banks as settlement balances, as in Lithuania and, until recently, Argentina. However, to meet the liquidity needs of banks that are experiencing sustained liquidity shortages, RR rates need to be adjusted on an ad-hoc basis (as in Argentina in the wake of the Mexican crisis) or compliance needs to be waived (as in Lithuania).<sup>54</sup> In addition to requiring the use of discretion, these ad-hoc modifications conflict with the monetary function of the instruments which call for uniform rates across banks and strict compliance. Moreover, RR can be lowered to inject liquidity, thereby increasing the scope for discretionary (and possibly unsound) monetary policy. In addition, high RR, unless remunerated at market interest rates, may harm bank profitability and promote disintermediation from the domestic banking system.

59. Liquidity requirements (LR) are better suited to prudential objectives, particularly to deal with systemic liquidity crises.<sup>55</sup> The structure of LR can be designed to induce banks to adjust the profile of their liabilities in a way that helps internalize some of the externalities associated with liquidity risk.<sup>56</sup> In countries where bank supervision is strong and the banking

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<sup>52</sup>See Rojas Suárez and Weisbrod (1996).

<sup>53</sup>The absence of exchange rate risk between the local currency and the reserve currency would in principle obviate the need for limiting open positions between the two currencies. However, some exchange rate risk and interest rate differential may remain, since adopting a CBA is not completely irrevocable. To avoid destabilizing capital inflows and excessive risk taking by financial intermediaries, limits may be useful, especially when CBAs are introduced in a context of large initial interest rate spreads between the domestic and reserve currencies.

<sup>54</sup>When the central bank—under strict CBA rules—is not allowed to acquire domestic assets, the foreign exchange backing of RR can only be used to increase liquidity if the demand for base money declines. Thus, in the event of a deposit withdrawal, only that fraction of the deposit which is held as RR can be made available to banks.

<sup>55</sup>LR were introduced in Argentina to substitute for RR in the wake of the Mexican crisis. Liquidity ratios have also been introduced in Hong Kong and Estonia.

<sup>56</sup>The liabilities that are volatile, have short maturities, or are close substitutes for foreign assets may be subject to higher LR. Liquidity and volatility are not always jointly correlated. In Argentina, for example, most of the deposit withdrawals that took place in the aftermath of

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system is sound, controls or restrictions over banks' use of liquid assets do not need to be intrusive. Moreover, LR can be fulfilled by allowing banks to directly deposit their reserves abroad. In the case of RR, such a provision would be more difficult to implement, since reserves are likely to be used also in daily interbank settlement. Thus, by endowing banks with broad responsibility for the use and management of their reserves, LR can limit the need for discretionary central bank intervention while containing moral hazard.

60. While adequate prudential regulations and supervisory practices can reduce the need for LLR, they do not eliminate it. In the absence of timely liquidity support from the central bank, isolated banking system difficulties can spread as a result of contagion and spillover effects, particularly under conditions of uncertainty. The recent Argentine experience illustrates well such risks in the context of a large external shock.<sup>57</sup> As the proportion of banks' liabilities which can be set aside in the form of liquid reserves is limited in a fractional reserve banking system, LR reduce but do not eliminate such risks.

61. As long as fractional reserve banking is in place and domestic banks account for a substantial share of the banking system, CBAs are likely to require at least some LLR support.<sup>58</sup> CBAs can provide LLR support provided they have sufficient excess foreign reserves. The foreign exchange backing for such support can originate from a common pool of bank resources or from the central bank if it has sufficient excess foreign reserves, as in the case of Estonia. The central bank may obtain automatic support from other central banks, as in the case of Hong Kong which established a protocol of this kind with other Asian central

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<sup>56</sup>(...continued)

the Mexican crisis originated from time deposits rather than demand deposits. LR may also need to apply to banks' short-term foreign liabilities, which may be called in in the case of a crisis.

<sup>57</sup>Argentina's recent financial crisis started with a liquidity squeeze in Bank Extrader, a small bank that was heavily exposed in Mexican bonds and securities. Argentina's Central Bank law prohibited the Central Bank from extending explicit last-resort support. Unable to honor its deposits, Extrader was closed on January 18, 1995. The fear that other banks were similarly exposed translated into a generalized banking panic. See Zarazaga (1995) and Machinea (1996).

<sup>58</sup>The alternative of establishing narrow banks was discussed recently in Argentina, see Fernández and Schumacher (1996). However, this may be difficult to implement in practice, as it would require highly developed financial markets and would involve complex and lengthy transitional arrangements.

banks in the wake of the Mexican crisis, or may guarantee, on behalf of local commercial banks, lines of credit with foreign banks, as recently implemented by Argentina.<sup>59</sup>

62. To limit moral hazard, LLR support should be collateralized with safe assets such as government securities.<sup>60</sup> In particular, banks may be encouraged to hold a fraction of LR in the form of government securities. In this case, the provision of LLR support becomes closely related to the support of the interbank money market and/or government securities market. Thus, to ensure proper coordination between monetary and LLR operations, it is preferable that LLR resources be deposited at (and administered by) the monetary authorities. There do not appear to exist clear advantages in establishing a separate institution for this purpose.<sup>61</sup>

63. To enhance systemic stability and encourage banks to restrain their risk-prone peers, an autonomous deposit insurance fund with limited coverage based and funded by the banks themselves can also be introduced. Moral hazard can be limited by setting insurance premia based on the riskiness of each bank's portfolio. Although such a risk-based system is not easy to administer, it was implemented, with apparent success, in Argentina.<sup>62</sup>

64. Finally, it should be noted that the restrictions a CBA imposes on the capacity of the monetary authority to assist banks in distress also has positive aspects. In particular, it makes it harder for the monetary authority to take on the quasi-fiscal costs of bank rescue operations which not only risk loss of monetary control but could delay the resolution of the crisis. A CBA thereby makes the costs and sources of any assistance from the public sector easier to identify.

### **C. Implications of a CBA for Public Debt Management**

65. To limit stress on public finances and the risk of a debt crisis, public debt management should be adjusted to suit a CBA environment, especially when the public debt is large and the

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<sup>59</sup>Banks may also be required to negotiate, on their own, lines of credit with foreign commercial banks, as in the case of Panama. However, such arrangements are likely to penalize the smaller banks that do not have access to foreign funds. Moreover, unless the credit lines are backed by foreign assets, the availability of such funds may become questionable in times of crisis.

<sup>60</sup>However, the central bank should not rule out other types of collateral, under exceptional circumstances.

<sup>61</sup>The provision of LLR could also be, in principle, directly assumed by the Government, as in Brunei Darussalam. However, to limit political pressures, it may be advisable to assign this function to an independent agency.

<sup>62</sup>See García (1996).

CBA has limited credibility. In particular, to avoid the risk of a bunching of maturing bills, it is helpful to have a balanced maturity structure of government securities. Nevertheless, OMOs may still be required to support the government securities markets and to prevent a severe liquidity squeeze in the event of a systemic crisis—particularly if government securities are an important component of banks' liquidity. In some cases, the government may be able to obtain the initial reserves by running a fiscal surplus or through a long-term external loan.

Subsequently, a fraction of the proceeds from additional bill issues can be systematically sterilized and deposited at the central bank.<sup>63</sup> At the same time, however, to avoid damaging the CBA's credibility, interest rate increases should contribute early on to attaining market equilibrium.

## V. DURATION OF A CBA

66. CBAs can clearly be perceived as permanent arrangements in countries that derive obvious trade and other benefits from belonging to a common currency area. Particularly in countries that are exposed to speculative attacks or that may undergo a phase of strong real appreciation, the authorities may wish to impress upon the public the perception that CBAs are long-term arrangements. In some cases, however, CBAs may be viewed as transitional arrangements designed to support a currency until credibility and institutions strengthen or a large exogenous change in the economic environment makes it advantageous to switch to a different currency and exchange rate arrangement. While an early exit from a CBA could limit risks of overvaluation, exiting a CBA by depreciating is likely to inflict a severe blow to the policy makers' credibility, particularly if the abandonment of the arrangement is not associated with an exogenous shock that clearly justifies it. Instead, Malaysia's and Singapore's experience shows that exiting a CBA from a position of strength—namely, by allowing the currency to appreciate—does not carry a similar penalty. It also shows that a law can be changed without overwhelming implications, provided policy makers respect its intent—i.e., to maintain the value of the currency. Nevertheless, legal restrictions can play an important role in preventing surprise devaluations, thereby enhancing the CBA's credibility.

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<sup>63</sup>When a large proportion of government securities is held by banks, establishing a pool of international reserves to back the government securities market can economize on the banking system's need for foreign exchange reserves, as it allows banks to hold part of their liquidity in domestic securities, rather than foreign securities. Even in the case of an incipient systemic crisis, banks are unlikely to be similarly and simultaneously affected by runs on deposits. Thus, when expectations of a forthcoming liquidity crisis inhibit the normal functioning of the interbank market, the central bank can support, through the security market, the banks that are first affected by deposit withdrawals, thereby staving off spreading risks.

### **A. Should CBAs Be Viewed as Transitory or Permanent?**

67. Credibility, by its very nature, is valuable because future policies are typically uncertain. Consequently, the credibility enhancing effect of a CBA is likely to prove most beneficial at the beginning of a regime change. At the same time, credibility is easier to maintain when the public clearly understands the rationale for a CBA and is aware that it would be irrational for the government to abandon the new institution at an early stage. Over time, however, the weaknesses derived from a CBA's inflexibility may become more relevant and apparent, and the arrangement's usefulness may become less important as confidence in the overall stance of government policy has grown. Thus, while rigid rules may be desirable during a transition phase, these rules may, over time, become unduly constraining. Similarly, as the monetary authorities build up their central banking expertise and financial markets develop, potential impediments to increasing the scope for policy discretion are reduced. The gradual relaxation of the CBA's rules, and its eventual abandonment in some cases, may therefore be viewed as the natural conclusion of a transitional process during which credibility is restored, institutions are built up and financial markets develop. This paradigm would suit, in particular, countries where monetary institutions lack initial credibility or expertise but where full monetary and exchange rate flexibility is seen as an important long-term goal.<sup>64</sup>

68. A change in the external environment may be the catalyst that induces the abandonment of the CBA, as in the cases of Singapore and Malaysia. In both cases, the CBAs were abandoned from a position of strength and as a result of conscious policy choices, in the wake of the break up of the Bretton Woods system.

69. However, the need to exit a CBA may also arise under stress, due to large external shocks or a build up of internal pressures, in particular those resulting from increasing real exchange rate misalignments. In Argentina, the CBA was suspended in both 1914 and 1929 as a result of large capital outflows linked with the advent of the First World War, in the first case, and the worldwide recession and sustained drop of commodity prices in the second. Pressures from the agricultural sector to devalue were a key factor underlying the suspension (which became permanent) of the second CBA.

70. The more recent experiences of Hong Kong, Argentina, and Lithuania underline the fact that CBAs on occasion continue to be exposed to attacks. As long as it is possible to alter the exchange rate, whether by decision of the executive branch or by law, expectations of changes in the parity may persist. For example, high deposit rates continued to prevail in Lithuania for months following false rumors of devaluation. In Estonia and Argentina, devaluation expectations linger, as reflected by the still substantial interest rate spreads between deposits in domestic and foreign currencies.

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<sup>64</sup>This scenario may be applicable, in particular, to economies in transition. In Lithuania, for example, the Executive Board recently urged the authorities to consider, in the long run, moving to a more flexible exchange rate arrangement (SUR/96/68).

71. When a country decides to make a CBA a permanent or long-term policy feature, it may need to adopt measures that minimize the vulnerability of the arrangement to attacks. Allowing dollarization can contribute to lessen pressures on the CBA by providing some scope for hedging devaluation risks internally and limiting the benefits of a surprise devaluation.<sup>65</sup> Institutional and structural reforms, particularly in the fiscal and labor market areas, can be used to deepen the authorities' commitment to the CBA and reduce the costs of operating within this arrangement, thereby cementing the fixed exchange rate rule. Such reforms are currently being implemented in Argentina.<sup>66</sup>

### **B. Legal Issues in Exiting From a CBA**

72. Although CBAs are subject to legal constraints on exchange rate policy, they differ in the nature of the rules and how they are expressed. Most currency boards establish an exchange rate by legislation. For example, in Argentina, the Convertibility Law currently establishes the exchange rate against the U.S. dollar at parity and allows no provision for changing it. By contrast, the earlier Argentine CBAs included a clause allowing the Government to rescind the arrangement in emergencies. In Estonia, the law declares an initial exchange rate and merely states that the authorities will not allow a depreciation of the national currency. Consequently, the possibility of an appreciation of the rate is not legally prohibited. In Djibouti, notwithstanding that the law establishes the exchange rate, the franc was revalued twice (against the U.S. dollar) during the breakup of the Bretton Woods system. The authorities were faced with either keeping to the letter of the law and accepting the devaluation of the U.S. dollar as cause for a concomitant devaluation of the Djibouti franc, or revaluing the Djibouti franc and keeping to the spirit of domestic price stability. The latter course was chosen and the currency board arrangement persisted. Singapore and Malaysia also allowed their currency to appreciate during the turmoil surrounding the breakdown of the Bretton Woods agreement.

73. These examples suggest that a CBA is more than a set of legal rules. In fact, credibility cannot reside solely in the legal exchange rate commitment. As Fischer (1992) and Sjaastad

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<sup>65</sup>However, even with full dollarization, a high degree of uncertainty might lead to investor concerns that bank deposits could be frozen and honored only in part. In that sense, deposits in the local financial system are not necessarily perfect substitutes for the currency of the reserve country or for deposits held in the reserve country.

<sup>66</sup>Although there is evidence that price and wage flexibility tend naturally to increase in countries that have adopted rigid exchange rate arrangements, as shown by Bayoumi and Eichengreen (1995) in the case of the gold standard, legal reforms, particularly in the area of labor legislation, may be needed to accelerate this process. Hong Kong, for example, has maintained labor market flexibility through the absence of both a social security system and institutionalized bargaining. The importance of similarly increasing the flexibility of the labor market in Argentina has been stressed (see EBS/93/101, 6/18/93, page 8).

(1992) have argued, governments that feel compelled to break rules will find a means to do so. Indeed, the public is well aware that laws can be changed. Hence, legal restrictions can form only a part of the fabric of a credible CBA. Moreover, the experience of Singapore and Malaysia suggests that in some instances commitment and the ability not to devalue the currency are viewed as more important for macroeconomic stability than the maintenance of a specific exchange arrangement.

### **C. Exit Strategies**

74. As argued in the introduction to this paper, legal restrictions to changing the exchange rate are an important determinant of the CBA's credibility. When a particular exchange rate is enshrined in the law, it may be quite difficult to adjust without the proposed change being known for some time before becoming effective. Somewhat different issues arise, depending on the nature of the exchange rate adjustment.

#### **Appreciation**

75. If it becomes known to market participants that a step appreciation of the currency is likely, a capital inflow will be attracted. The subsequent dynamics of the money market are difficult to predict but there is a clear possibility that market reactions would undermine the appreciation strategy. In the face of large capital inflows, the CBA may no longer be able to back the expanded monetary base at the contemplated new exchange rate. The CBA could also sustain large losses, as the appreciation would increase the value of the CBA's liabilities relative to that of its assets.<sup>67</sup>

#### **Depreciation**

76. If a depreciation is anticipated, this will be reflected in capital flight, as holders of domestic currency-denominated assets attempt to convert them into the reserve currency.<sup>68</sup> While there is no technical limit to the increase in domestic interest rates that can equilibrate the money market, there is a limit to how long a banking system could weather a large interest rate shock. Thus, there is also a strong potential for bank runs, until the new exchange rate is established in the law.

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<sup>67</sup>To mitigate such problems, the authorities could choose instead to seek legislative approval to let the currency crawl upward. Provided that the rate of crawl is gradual enough so that the downward adjustment in domestic interest rates can compensate for the slow expected appreciation of the local currency, this policy should not of itself induce capital inflows.

<sup>68</sup>It is implicitly assumed here that making changes to the law would be sufficiently time-consuming to eliminate the element of surprise.

77. Administrative solutions can be imagined to alleviate the pressure on the banks from deposit withdrawals. For example, existing contracts denominated in domestic currency could be forcibly converted into the reserve currency equivalent prior to the devaluation, as proposed by Aurnheimer (1992). Or else, the convertibility of bank deposits could be suspended temporarily, as in several occasions during the gold standard. However, all such measures would severely damage the policy makers' credibility.

78. As in the case of an appreciation, a pre-announced move to a downward crawling peg could be considered, as a way to minimize the credibility cost of breaking the exchange rate rule. However, unlike in the case of an appreciation, a downward crawl raises the risk of losing control of inflation. It may thus be difficult to correct for a strongly overvalued exchange rate.

#### **Switch to a float**

79. A move to a float can be an appropriate exit strategy, particularly if a CBA currency is under pressure to appreciate, as illustrated by the examples of Malaysia and Singapore in 1973. Provided the exchange rate misalignment is not too large, for countries not wishing to move to a free float immediately, the currency could be allowed to float within a band which could be made into a crawling band. The risk, inherent in moving to a float, of losing the nominal anchor would clearly have to be weighed. Management of an exit strategy with narrow bands is likely to be easier in the case of an incipient appreciation than a depreciation.

#### **Switch in the peg**

80. A further option would be to change the reserve currency, as was done in Singapore and Djibouti. The objective would be to attain a real effective appreciation (depreciation) through a gradual nominal appreciation (depreciation) of the new reserve currency against the basket of trading partners' currencies. Presuming that the switch would occur at the relevant market cross exchange rates on the day of its implementation, this would not lead to destabilizing capital flows. However, the usefulness of such a switch would be limited because of the difficulties of predicting, and therefore the impact on the real exchange rate of the CBA currency.

#### **Built-in escape clauses**

81. To prevent policy surprises, hence avoid the perception of a breach of policy commitment, CBAs could, in principle, incorporate an explicit exchange rate escape clause. Although the theoretical literature on this subject is not decisive, any such rules would most likely undermine the credibility of the CBA.<sup>69</sup> In particular, as a trigger point for exiting the CBA is approached, the dynamics of capital flows are likely to force the authorities' hand

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<sup>69</sup>See Obstfeld (1991).

more quickly than would otherwise be the case. For this reason, well known escape clauses could induce one-sided speculation and lead to CBA failure, in cases where without a public escape clause the arrangement might have survived.

82. There may well be some asymmetry in the possibility of designing an exit clause depending upon whether an appreciation or a depreciation is envisaged. Thus, Estonia and Lithuania have given the central bank discretion to appreciate the rate without specifying under what conditions this would be attempted.<sup>70</sup> Cases where a devaluation would be contemplated would be more difficult to manage. For example, the law could allow the Government to suspend the CBA under a national emergency. The advantage of this type of escape clause is that it can be triggered rapidly and would make speculation more risky. The disadvantage is that it makes discretion possible under conditions that may not be well defined, which may seriously affect the CBA's credibility.

#### **D. Exit Conditions**

83. The timing for the exit will depend on the motivations that a country had for introducing the CBA. If it was introduced as a transitory arrangement until the authorities could develop the full range of functions typical of a central bank, then the degree of development of such functions would provide a way to gauge the appropriate exit point. In this case, exiting from a currency board should be seen as a success rather than a failure. Moreover, increasing monetization of an economy may also pose the question of whether it is optimal to stay with a CBA regime given that balance of payments surpluses need to be generated in order to provide the required backing for the CBA. Thus, in such cases, switching from a CBA to a conventional central banking arrangement may be viewed as part of a normal evolutionary pattern. This may have been the case for Singapore, for instance. The graduation of Ireland in the 1970s and Luxembourg in the 1980s may also be seen as an example of this phenomenon.

84. A country's authorities may also be willing to go beyond the constraints of abiding by their own rules to those of abiding by externally generated rules—i.e., those of a currency union. For instance, the Baltic countries have aspirations to join the European Union and their currency boards could be viewed as a first stage toward adhering to the EMU.

85. Exiting CBAs in countries that have introduced them to gain credibility is somewhat more problematic. The exit would have to wait at least until strong policies have been in place for a sufficiently long time to ensure that credibility will be maintained after the demise of the CBA. On occasions, this may imply withstanding substantial real exchange rate misalignments.

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<sup>70</sup>In Estonia the central bank is allowed only to appreciate the rate. In Lithuania changes are allowed in either direction.

86. Whether a currency is under pressure to appreciate or depreciate can facilitate or complicate the exit from a CBA. The experience of Malaysia and Singapore suggests that a tendency for the domestic currency to appreciate can help minimize or eliminate the disruption that abandoning the CBA could trigger. When the currency is expected to depreciate, a phased-in exit that avoids sharp readjustments of the exchange rate—i.e., that minimizes the break with the CBAs' no surprise pledge—would be less damaging to policy makers' credibility. In such cases, a crawling peg or a gradually widening crawling band may be appropriate. However, there may be cases when macroeconomic conditions require a step devaluation, despite its likely negative credibility effect. In any case, strong macroeconomic policies, particularly with regard to the fiscal sector, will be required to minimize the disruption that exiting a CBA is likely to entail. Such policies will need to be stronger, the larger the loss in credibility caused by the exit.

## **VI. IMPLICATIONS OF CBAS FOR THE DESIGN OF FUND-SUPPORTED PROGRAMS**

87. Although it might be argued that in the setting of a CBA all balance of payments disequilibria should adjust automatically, experience has shown that when sufficiently large shocks impinge upon the domestic economy, the government may need to implement active measures to maintain external balance. Therefore, the fundamental rationale of Fund support for adjustment programs—to provide members with the opportunity to correct disequilibria in their balance of payments without resorting to disruptive measures such as trade and payments restrictions—is as valid in the context of a CBA as in a conventional fixed exchange rate case.<sup>71</sup>

### **A. Use of Fund Resources**

88. The Fund has a direct role to play in two particular instances where Fund resources can be used to bolster the CBA and support the authorities' adjustment program.

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<sup>71</sup>In determining whether a balance of payments need exists, the Fund will take note if a member maintains a currency board arrangement. In this regard, "a particular question may arise as to how to assess the reserve position in the case of countries with currency board exchange arrangements. The appropriate level of reserves under such a system may need to take account of the mandated foreign exchange cover for the monetary base plus an additional reserve cushion to provide some flexibility in case of unexpected events. A judgment as to the adequacy of this reserve cushion should be the determining factor in assessing the reserve position. Thus, where the monetary base is large, a country could conceivably have a high level of reserves relative to imports but still have a balance of payments need because its reserve cushion is viewed as not being adequate." See: "Need as a Condition for the Use of Fund Resources" (SM/94/299, 12/16/94), page 30.

### **Providing initial backing to a currency board**

89. At the establishment stage of the currency board the authorities may need official foreign reserves backing to cover domestic monetary liabilities. In Lithuania, a Fund arrangement was designed to prevent the possibility that a potential demand for conversion of the domestic monetary base into foreign currency might lead to the imposition of payments restrictions, or raise a question as to the viability of the CBA.

90. Although, in such cases, the CBA is likely to be introduced within the context of an overall adjustment program, there is no automatic mechanism by which the CBA generates the means to repay its foreign obligations. In recognition of this problem, the Lithuanian authorities, in their Memorandum of Economic and Financial Policy, dated September 30, 1993, stated that the central bank would retain its profits until it could cover its liabilities with its own foreign resources.

### **Providing LLR support to an existing CBA**

91. A second case that would call for Fund involvement is where a sudden shock leads to a liquidity crisis that cannot be handled within the extant domestic financial framework. This was the case of Argentina in 1995. In such cases, a sudden capital outflow may lead to an incipient financial crisis. The knowledge that the central bank cannot provide liquidity support can lead to a self-fulfilling run on banks. Much as in the previous scenario, Fund resources can bolster credibility in the sustainability of the CBA—a key feature for the CBA's self-adjusting mechanism to continue to operate and avoid a collapse of the adjustment program. It thereby serves to support the maintenance of a liberal exchange regime. Ideally, the right to draw from the Fund would help reestablish confidence and does not need to be utilized. Promptness in the capacity of the authorities to draw in such an eventuality may add to the credibility of the CBA.

92. Although the connection with balance of payments viability is indirect, the maintenance of a sound banking system is increasingly recognized as essential for successful economic stabilization. The Fund should therefore caution countries adopting a CBA about the risks that an unsound financial system poses for the sustainability of the arrangement, and insist that appropriate measures be adopted. The Argentine authorities, for example, have adopted a number of important measures that have reduced the risk of systemic banking problems. They have also established a stand-by line of credit with a group of foreign commercial banks that may be drawn down in times of bank distress.

## B. Fund Program Targeting in CBAs<sup>72</sup>

93. In stylized form, the design of a conventional macroeconomic framework for a Fund-supported program begins with the setting of a target path for the balance of payments. A projection is then made for money demand consistent with the program. An implied ceiling on the expansion of net domestic assets (NDA) of the central bank is derived. The central bank is then committed—through control of its NDA—to attaining the balance of payments target, expressed as a floor on the stock of net international reserves (NIR).<sup>73</sup> In particular, in the event money demand is less than projected, central bank NDA must be kept below the NDA ceiling.

94. The problem with this approach in a CBA is that the spirit of the arrangement rules out the active use of policy measures that influence NDA. Nor, of course, does it use the exchange rate as an instrument. NIR is therefore outside the CBA's effective control. To take account of these factors, Fund program design has been modified. First, Fund-supported programs in the context of CBAs place greater emphasis on the importance of fiscal adjustment and structural reforms. In the monetary area, Fund-supported programs in CBAs have replaced the conventional floor on NIR and ceiling on NDA with a floor on free international reserves (FR), defined as NIR minus the currency board's monetary liabilities (RM).<sup>74</sup> An important quality of FR is that it is unaffected by currency board conversions of reserve money and foreign currency, unlike NIR. If, for example, conversion of domestic currency into foreign currency exceeded the program assumption, no action would be required on the part of the CBA authorities to offset this decline in money demand, whereas, in a conventional program, NDA would need to be adjusted downward to attain the NIR target. While, in conventional programs, NIR targets are set with the objective of attaining an improvement in the balance of payments (NIR targets are typically related to months of imports), in CBAs, NIR adjust endogenously to maintain the backing of base money.<sup>75</sup>

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<sup>72</sup>The structure and evolution of Fund conditionality in current CBA programs is provided in an appendix to this paper.

<sup>73</sup>This exposition assumes that the central bank relies on indirect instruments of monetary control. Alternatively, the authorities could directly control net domestic assets of the banking system. Apart from the latter's clear inconsistency with the emphasis of currency boards on the free interplay of market forces, it would not affect the subsequent analysis.

<sup>74</sup>This captures the essence of the target. Precise definitions of the associated performance criteria differ from country to country.

<sup>75</sup>As can be seen from manipulating the simple central bank balance sheet identity:  $NIR + NDA = RM$ , the CBA program floor is identical to a ceiling on NDA. What is "missing," then, is the analogue to the conventional NIR target.

95. Fund programs recognize, however, that CBAs do have some policy discretion coming from excess reserve cover or, in those cases where it is permitted, the ability to fall below full backing. In light of the risk to credibility that discretion entails, it is more important in CBAs than in conventional cases to outline clearly the extent to which such monetary instruments may be used and explain that they will be used only in ways that support the sustainability of the program. While the performance criterion on FR restricts the scope for discretionary credit expansion, permissible uses of domestic credit may also need to be spelled out. Thus, LLR support—or more conventional rediscount operations or swaps—have been explicitly restricted in CBA programs. In addition, the programs in Estonia and Lithuania have emphasized the importance of not lowering reserve requirements, which would have an expansionary impact on credit conditions. Nevertheless, reserve requirements were lowered in Lithuania to address systemic banking problems; the Fund granted a waiver in that case.

96. CBAs are able to grant credit to banks if they hold or borrow foreign reserves in excess of what is needed for backing purposes. When determining the limit a Fund-supported program might place on changes in free international reserves and on central bank borrowing, the country's access to international capital markets and its vulnerability to external shocks must be considered as well as the likely need and magnitude of lender-of-last-resort support. This, in turn, would depend on the importance and soundness of domestic banks, their liquidity position, access to foreign financing, and the level and nature of the reserve requirement. The need for flexibility to engage in monetary operations would depend, *inter alia*, on the design and functioning of the payments system and interbank market. Lastly, it would be important to ensure that the maturity of central bank borrowing is sufficiently long-term not to compromise the backing rule.

## VII. CONCLUSIONS AND ISSUES FOR DISCUSSION

97. This paper has taken the view that CBAs may be attractive permanent arrangements for small open economies that wish to preserve the benefits of belonging to a broader currency area. Alternatively, they are useful transitional arrangements for countries that wish to delay the introduction of a full-fledged central bank until they build up central banking expertise or develop financial markets. CBAs may also be attractive to high-inflation countries adopting strong stabilization programs that wish to enhance the credibility of monetary policy. The implied fiscal stringency of a CBA and lack of discretion are not to be accepted lightly, however, because the consequences of a failed currency board experience can be substantial.<sup>76</sup> Under such circumstances, it is essential that the authorities carry through with their adjustment effort with the intention either to exit the CBA from a position of strength or eventually to solidify the arrangement through the adoption of the long-term structural

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<sup>76</sup>While it is true that failure to sustain any adjustment strategy may have serious consequences, the greater investment made in generating credibility effects in a currency board means that the failure of a currency board can be particularly devastating.

reforms necessary to limit the costs of operating within the CBA framework. In all cases, strong public finances, wage flexibility, and sound financial systems are key prerequisites for robust CBAs.

98. As regards the trade-offs between flexibility and credibility in CBAs, recent experiences suggest that monetary and prudential instruments, operational procedures, and institutional arrangements can be adapted in ways that limit the need for discretionary intervention by the authorities. Nevertheless, the paper suggests that some discretionary monetary and LLR support is generally needed to limit the risks of systemic liquidity crises at an acceptable cost. While less essential, a day-to-day monetary regulation capability may also be developed. In all cases, sufficient access to foreign exchange resources, in excess of those needed to back the CBA's convertibility rule, must be secured to support such operations.

99. The paper suggests that the rationale for Fund-supported adjustment programs based on CBAs remains valid, although under slightly different forms and with somewhat different risks. In particular, the availability of Fund resources in case of a balance of payments crisis enhances the credibility provided by a CBA's reserve backing. Fund resources are expected to bolster the CBA and play a catalytic, rather than a direct financing role. As compared to programs designed for other situations, Fund-supported programs in countries having a CBA need to put greater emphasis on fiscal adjustment and structural reforms—including in the labor market—and program targets need to be modified to account for the greater endogeneity of monetary aggregates and the limited scope for discretion in monetary policy.

100. CBAs constitute a particular subset of fixed exchange rate arrangements. At any time, any given CBA may be made more or less rigid and rule-bound. In circumstances where credibility, transparency and simplicity are paramount, little, if any, discretion is typically warranted. In other cases, where credibility has been established, and a role for money market intervention, LLR capability and government management of the payments system are important, more flexibility may be desirable in the CBA. In this sense, the line between a CBA and a more conventional fixed exchange rate is an arbitrary one.

101. In discussing the issues raised by CBAs, Directors may wish to consider the following questions:

(i) What do Directors see as the main advantages and drawbacks of currency board arrangements?

(ii) In Directors' view, under what conditions should a country consider introducing a CBA?

(iii) What initial economic conditions and policy measures do Directors regard as fundamental in order for the successful introduction of a CBA?

(iv) What are Directors' views on whether the Fund should advise countries with CBAs to maintain "bare-bones" institutions or to engage in evolutionary institution-building to increase the flexibility of their monetary arrangement?

(v) In light of the Board discussion of the papers on "Bank Soundness and Macroeconomic Policy" on March 11, 1996, and on the "Adoption of Indirect Instruments of Monetary Policy" on December 7, 1994, do Directors believe that a LLR facility and monetary operations are useful complements to a CBA?

(vi) Do Directors agree that operations such as an LLR facility and monetary operations need to have explicit financial arrangements, such as a buffer of international reserves or contingent credit arrangements?

(vii) Under what conditions do Directors view it appropriate for the Fund to provide financial assistance to a program that includes a CBA? Would it be appropriate to build in some level of automaticity that would allow a CBA country to draw in case its own LLR facility comes under pressure?

(viii) Under what conditions do Directors believe that it is appropriate or desirable for a country to exit from a currency board arrangement?

## FUND EXPERIENCE WITH PROGRAM DESIGN IN CBAS

### A. Estonia

102. Estonia undertook an adjustment program supported by an IMF stand-by in September 1992. Although the fiscal performance criteria were conventional, those relating to the balance sheet of the BOE were innovative. These are discussed below.

103. • There was a "continuous" requirement that Estonia would maintain full foreign reserve backing for the currency board's liabilities. In as much as the currency board would appear to be required to meet this commitment by law, this condition might appear to be redundant. However, for program purposes, deposit liabilities of the Savings Bank were included as liabilities of the currency board. The rationale was that the Savings Bank deposits were indirect liabilities of the BOE and the former had no liquid assets to match its deposits.<sup>77</sup> The conditionality was therefore needed to ensure coverage of the Savings Bank's liabilities, a difficulty that had not been contemplated in the Currency Board Law.

104. At the time of the introduction of the CBA on June 20, 1992, the BOE held official foreign reserves in excess of its liabilities, excluding those related to the deposits of the Savings Bank. However, for a brief period it was unable to claim full foreign exchange cover for all of its liabilities, pending receipt of further restitution of prewar reserves held by the Swedish government and the release by the BIS of gold held in account with the Bank of England (this occurred prior to the Fund's Board approval). The coverage of the deposits of the Savings Bank was to last until that bank constituted reserve deposits with the BOE as other banks in the system were required. Somewhat later, the Savings Bank established a required reserve account with the BOE (initially at 100 percent of individual deposits and subsequently lowered in stages). Its deposits were thereafter treated in the same way—legally, and under the program definitions—as commercial bank deposits at the BOE.

105. • There was a quarterly performance criterion setting a floor on BOE NIR minus currency board (CB) liabilities (what has been earlier called "free international reserves," FR)—defined to include kroon notes and coins in circulation, kroon reserve deposits of banks at the BOE and the liabilities of the Savings Bank. To see the difference between this requirement and that in paragraph 103, above, it is useful to look at the actual numbers in a program. For the stand-by discussed in EBS/93/166, the actual stock of FR on June 30, 1993 was DM 67.2 million. The floor set in the program for December 31, 1993 was DM 45 million. Under paragraph 103, FR had to remain above zero (and thus could fall by DM 67.2 million) at all times. Under the latter definition, the level of FR could also fall but by year end could be only DM 22.2 million below the beginning of the period level. This

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<sup>77</sup>This was one case of the then widespread problem of the various republican Savings Banks having their assets tied up in the contentious disposition of the assets and liabilities of the former U.S.S.R Gosbank (Moscow).

effectively limited the extent to which BOE FR could be used to support troubled banks, a possibility that had been foreseen when the program was designed. It was also understood that commercial banks would be permitted to utilize their reserve deposits at the BOE to meet temporary liquidity shortages.<sup>78</sup>

106. At the time of the first review under the Stand-by arrangement, the BOE intended to improve the working of the commercial bank interbank money market by increasing the availability of liquid assets that could serve as collateral through the issuance of BOE certificates of deposit. As the CDs would be a direct obligation of the CB, they were included as a reserve liability in the calculation of NIR for program purposes (EBS/93/39). This rather unorthodox treatment is worthy of further explanation.<sup>79</sup>

107. Under the original program definition of FR, the exchange by the BOE of a CD for kroons would immediately raise FR owing to a fall in CB kroon liabilities. This would have allowed the BOE an additional margin that could have been utilized to provide domestic credit. However, the program had also envisaged that domestic credit was to be granted only in the event of a banking liquidity crisis, hence the authorities had committed themselves to a separate limit on such finance in their Letter of Intent (LOI). To avoid undermining this limit, BOE CDs were added to liabilities in the definition of FR used in the LOI.<sup>80</sup>

108. • Estonia stated in its Memorandum of Economic Policies that "The Bank [of Estonia] will not have the capability to extend credit to Government" (paragraph 31). This statement was made effective with the passage of the Bank of Estonia Law in May 1993.

109. • Lastly, the Government was to ensure that actual holdings of commercial bank reserves at the BOE did not fall below required reserves (as defined in the program) by more than one percent. This restriction prevented the BOE from lowering RR or allowing banks to maintain, in the aggregate, substantial persistent deficits in their reserve accounts.

110. Why should this be employed as a performance criterion for Estonia but not in other Fund-supported programs? In programs designed with NDA of the central bank as the intermediate target (and performance criterion), the appropriate target for the central bank's NDA is derived from the demand for money by employing—implicitly, if not explicitly—a

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<sup>78</sup>Prior to this, reserve requirements followed the Soviet system which "froze" the reserve requirement account in the central bank preventing these funds from being utilized in the interbank settlement process or withdrawn.

<sup>79</sup>Typically, an issue of central bank CDs is treated as a reduction in reserve money and NDA.

<sup>80</sup>As of March 31, 1993 all kroon liabilities of the Bank of Estonia on its correspondent accounts with other FSU states were also included in the calculation of FR under the program.

projection or assumption about the money multiplier. One of the key elements in the multiplier is the required reserve ratio.

111. Under a conventionally designed Fund-supported program, then, a more expansionary monetary policy can be followed, for any given central bank NDA ceiling, by a reduction in the required reserve ratio. If this reduction is undertaken in the context of a genuine increase in the demand for money, then the released required reserves will be accommodated in the domestic economy without an adverse impact on the balance of payments. This, in turn, would—*ceteris paribus*—allow the authorities still to attain the floor on central bank NIR. If, however, the reduction in the required reserve ratio was undertaken in a context where the additional liquidity was not demanded by the domestic economy, an adverse impact on the balance of payments would likely occur, leading to a failure to achieve the program NIR target. Hence in the standard fixed exchange rate case, the performance criterion on central bank NIR would appear sufficient to ensure that the monetary authorities do not undertake an inappropriately expansionary reduction of the reserve requirement.

112. As discussed in Chapter VI of the main text, the key difference between the above scenario and that with a CBA is that there is no limitation on conventional NIR. Furthermore, in the overly expansionary scenario discussed in the preceding paragraph, FR would not be affected. Reserve money would fall (increasing FR) which would be exactly offset by the decline in foreign assets (decreasing FR). For this reason, i.e., because the FR performance criterion in a CBA context does not capture an expansionary decline in the RR, it is appropriate to include a provision preventing such declines in CBA programs.

### **B. Lithuania**

113. Lithuania introduced its CBA on April 1, 1994, halfway through a Stand-by Arrangement.<sup>81</sup> The Staff Report for the 1994 Article IV Consultation and Review of the Stand-By Arrangement (EBS/94/60, 3/23/94) outlined the changes to the program that would take place following the introduction of the CBA. These included:

114. • Discontinuing the performance criterion on net domestic assets of the Bank of Lithuania (BOL) and the indicative limit on reserve money since, under the CBA, neither would be subject to the influence of the authorities.

115. • A redefinition of the NIR floor to include, as liabilities, litas notes and coins in circulation, total reserve deposits of banks with the BOL, certificates of deposit issued by the BOL and other BOL litas liabilities. Thus it became a FR floor. It was also noted that foreign assets pledged as collateral or otherwise encumbered would be excluded from foreign assets in calculating NIR.

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<sup>81</sup>For an in depth discussion of the Lithuanian experience see Camard (1996) and "Republic of Lithuania—Recent Economic Developments," SM/96/128, 6/12/96.

116. • A requirement that full foreign exchange backing for currency board liabilities be maintained at all times.

117. • A minimum RR was set on commercial bank domestic and foreign currency deposits (initially set at no more than 1 percentage point below 12 percent).

118. Thus with small country-specific differences, the performance criteria were similar to those set for Estonia.

119. An important factor distinguishing Lithuania from Estonia is that the former did not have sufficient foreign assets to provide for net foreign exchange cover; that is, FR as defined in the program was negative at the outset and, although projected to rise—in part through the application of BOL profits—was programmed to remain negative throughout the program period. Indeed, the current program supported by the Extended Arrangement anticipates that the level of FR will remain negative through end-March 1997.

120. In this case, the Fund has effectively provided the foreign financing to enable the establishment of the CBA. The program creating the CBA had a financing gap reflecting the need to obtain gross foreign reserve backing for the CBA that was filled through the use of Fund resources. This was explicitly recognized in the authorities' Memorandum of Economic Policies (September 29, 1994)—where they noted the need to retain all profit earned on the BOL's foreign exchange reserves until the BOL's holdings of gross foreign exchange reserves were sufficient to back all litai in circulation without recourse to use of Fund credit ("Republic of Lithuania—Request for Extended Arrangement," EBS/94/199). Notwithstanding the initial lack of reserve coverage, margins were provided under the program for lending to commercial banks facing acute liquidity shortages that might lead to systemic problems. The accumulation of additional foreign exchange reserves for this purpose was also viewed as a desirable goal ("Republic of Lithuania—Request for Extended Arrangement Supplement 1," EBS/94/199 Supplement 1).

121. Besides the lack of foreign reserve coverage, there were several measures taken by the authorities that brought into question the credibility of the CBA. These included changing the regulations so that treasury bills purchased at one particular auction were permitted to be counted toward satisfaction of the RR; exempting one bank from the RR in exchange for its extension of credit to a state energy company to finance energy imports; placing part of BOL's "international" reserves with domestic banks; and pledging central bank foreign exchange reserves at a foreign bank as collateral for a loan from this bank to the energy companies.

122. Also challenging the credibility of the CBA was the banking crisis which became manifest in late 1995. In December, one large bank and two medium-sized banks (accounting, in total, for approximately 25 percent of banking system deposits) were placed under moratorium. Following the closures, capital outflows continued and commercial bank reserves at the BOL fell below the legal minimum. At the same time, the interbank money market ceased to function and interest rates rose sharply. In response, the BOL waived penalties on

commercial bank reserve shortfalls. Subsequently, the BOL ratified the decline by lowering the reserve requirement from 10 percent to 5 percent with a pre-announced increase in the requirement (one percentage point per quarter) until it again reaches 10 percent. Although the Fund granted a waiver for the non-observance of the performance criterion on average reserve deposits of the commercial banking system, some Directors, during the discussion of the 1996 Article IV Consultation, argued that the reduction in the reserve requirement was inconsistent with the nature of the CBA.

### C. Argentina

123. Following the introduction of the Convertibility Law in March, 1991, a Stand-By Arrangement from the Fund was approved the following July. Unlike the cases of Estonia and Lithuania, the performance criteria in the program were unchanged from those employed in the previous Stand-By Arrangement. In the Staff Report on Request for Stand-By Arrangement, EBS/91/107, Supplement 1, the staff pointed to several factors implicitly justifying the maintenance of the conventional restriction on central bank NDA.

124. It was noted that the Convertibility Law permits up to one-third of the monetary base to be backed by U.S. dollar-denominated debt of the Government of Argentina (BONEX) and that this provided the authorities with significant scope for engaging in OMOs. The authorities anticipated using this scope in limited amounts to smooth interest rate fluctuations in response to seasonal variations in money demand—mostly on an overnight basis.<sup>82</sup> The central bank NDA target was designed to keep these interventions small and transitory.

125. The program also envisaged the establishment of a timetable for the repayment of central bank (BCRA) credit extended to provincial banks. The BCRA also was involved in an active program to reduce its rediscounts with commercial banks by permitting repayment at a discount. The limit on central bank NDA could thus be seen to support the authorities in their intention to reduce credit to the banking system as part of an overall strategy to reduce the role of banks structurally dependant on BCRA credit. The policy was combined with a strong stance against banks failing to meet their obligations in the interbank clearing.

126. Nonetheless, the maintenance of the conventional criteria became a source of contention between the authorities and staff. In the Staff Report for the 1993 Article IV Consultation, and Review Under the Extended Arrangement (EBS/93/101, 6/18/93), the staff expressed concern about the high rate of growth of domestic credit due to strong capital inflows, and proposed an increase in RR as well as action to place Treasury deposits at the Central Bank. The authorities resisted the former, however, arguing that the process of remonetization was still at an early stage. At the Board discussion, many Directors expressed the belief that monetary policy had been too easy and a number expressed support for the

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<sup>82</sup>The high incidence of tax payments during certain days of the month was specifically cited as a motivation for central bank intervention in the money market.

imposition of RR on foreign currency and peso deposits, while supporting the authorities' decision to shift a larger share of nonfinancial public sector deposits to the BCRA (SUR/93/73, 7/16/93).

127. In the Staff Report for the 1994 Article IV Consultation and Eighth Review under the Stand-By Arrangement (EBS/94/132, 6/28/94), the issue of program design resurfaced. Therein, staff noted that "The authorities have consistently taken the view that targeting NIR and undertaking an active monetary policy was inconsistent with the policy framework of the convertibility regime..." (page 11). In this context the authorities had noted that their monetary intervention had been strictly limited to smoothing fluctuations in the interbank money market rates. For its part, the staff noted that scope remained for OMOs and argued that BCRA NIR served as a safeguard in that it indicated a deviation from the programmed level of money demand and thus signalled a need to tighten net central bank credit. To tighten credit, the mission had noted that government bonds could be issued and the proceeds sterilized at the central bank.

128. Following the onset of the Mexican crisis in December 1994, banks in Argentina came under considerable strain. In response the authorities lowered RR, utilized the margin they had under the Convertibility Law to extend credit to troubled banks, arranged for two percentage points of the required reserves to be channelled to the state-owned Banco de la Nación to allow it to purchase assets from financial institutions with liquidity problems, and set up two Trust Funds—to be financed from external resources—to set up a commercial bank safety net. In March, 1995, the central bank charter was changed by decree to allow it to provide rediscounts for periods exceeding 30 days and in amounts in excess of the net worth of each commercial bank. During the concurrent program negotiations, it was decided that the performance criterion on NIR would be redefined to be "free international reserves." In addition to FR, conventional NIR was maintained as an indicative target during the EFF arrangement which expired in March 1996 ("Argentina—Request for Extended Arrangement," EBS/95/51, 3/23/95). The program continued to place a constraint on central bank NDA although the staff is currently considering whether it should be dropped as redundant.

#### **D. Djibouti**

129. Djibouti undertook an adjustment program that was supported by a Stand-By Arrangement from the Fund in April, 1996. The performance criterion on NIR was defined as in the other CBA programs, conventional NIR minus currency board liabilities. As the National Bank of Djibouti (NBD) does not impose a reserve requirement, unlike Estonia and Lithuania, there is no performance criterion on commercial bank reserves at the NBD, although there had been some discussion of placing a limit on the level of clearing balances. An interesting feature of the program is that the Fund resources are on-lent from the NBD to the government in an SDR-denominated loan to ensure that the Government bears the exchange rate risk. Lending from the NBD to Government (apart from the on-lending of Fund resources) would be cause for making Djibouti ineligible to make a scheduled purchase.

REFERENCES

- Auernheimer, Leonardo, "Currency Boards and Policy Rules," in Proceedings of a Conference on Currency Substitution and Currency Boards, World Bank Discussion Papers 207 (1993).
- Bayoumi, Tamin, and Barry Eichengreen, "The Stability of the Gold Standard and the Evolution of the International Monetary System," Center for Economic Policy Research Discussion Paper No. 1248 (1995).
- Bennett, Adam, "The Operation of the Estonian Currency Board," IMF Staff Papers, 40, No. 2 (June 1993).
- \_\_\_\_\_, "Currency Boards: Issues and Experiences," IMF PPAA/94/18 (September 1994).
- Bhatia, Rattan, "The West African Monetary Union: An Analytical Review," IMF Occasional Paper No. 35 (May 1985).
- Bollerslev Tim, and Michael Melvin, "Bid-Ask Spreads and Volatility in the Foreign Exchange Market: An Empirical Analysis," Mimeo, Northwestern University and Arizona State University (April 1994).
- Bordo, Michael D. and Finn E. Kydland, "The Gold Standard as a Rule," NBER Working Paper No. 3367 (May 1990).
- \_\_\_\_\_, and Hugh Rockoff, "The Gold Standard as a 'Good Housekeeping Seal of Approval,'" NBER Working Paper No. 5340 (November 1995).
- Calvo, Guillermo, Leonardo Leiderman and Carmen M. Reinhart, "Capital Inflows and Real Exchange Rate Appreciation in Latin America: The Role of External Factors," IMF Working Paper WP/92/62 (August 1992).
- \_\_\_\_\_, and Enrique Mendoza, "Reflections on Mexico's Balance-of-Payments Crisis: A Chronicle of a Death Foretold," Unpublished Manuscript, Center of International Economics, University of Maryland (October 1995).
- Camard, Wayne, "Discretion with Rules? Lessons from the Currency Board Arrangement in Lithuania," IMF PPAA/96/1 (March 1996).
- Collins, Charles, "Alternatives to the Central Bank in the Developing World," IMF Occasional Paper No. 20 (1983).

- Davies, Careth, and David Vines, "Equilibrium Currency Crises: Are Multiple Equilibria Self-fulfilling or History Dependent?" Center for Economic Policy Research Discussion Paper No. 1239 (1995).
- Dornbusch, Rudiger, "Stabilization Policies in Developing Countries: What Have We Learned?" World Development, pp. 701-708, Vol. 10 (September 1982).
- Drazen, Allan, and Paul Masson, "Credibility of Policies versus Credibility of Policymakers," Quarterly Journal of Economics, Vol. 104, pp. 735-54 (August 1994).
- Eichengreen, Barry, Andrew Rose and Charles Wyplosz, "Speculative Attacks on Pegged Exchange Rates: An Empirical Exploration with Special Reference to the European Monetary System," NBER Working Paper 4898 (1994).
- Fernández, Roque and Liliana Schumacher, "Does Argentina Provide a Case for Narrow Banking?" (1996). Presented at the World Bank Conference on Preventing Banking Crises in Latin America.
- Fischer, Stanley, "Seignorage and Official Dollarization" in Proceedings of a Conference on Currency Substitution and Currency Boards, edited by Nissan Liviatan, World Bank Discussion Papers No. 207 (1993).
- Friedman, Milton, A Program for Monetary Stability, Fordam University Press (1959).
- García, Gillian, "Deposit Insurance: Obtaining the Benefits and Avoiding the Pitfalls," IMF Working Paper WP/96/83 (August 1996).
- Gavin, Michael and Ricardo Hausman, "The Roots of Banking Crises: The Macroeconomic Context," Inter-American Development Bank (1995).
- Goodfriend, M. and R.G. King, "Financial Deregulation, Monetary Policy, and Central Banking" Federal Reserve Bank of Richmond, Economic Review, Vol. 77, pp. 7-24 (June 1988).
- Guitián, Manuel, "Rules and Discretion in International Economic Policy," IMF Occasional Paper, No. 97 (Washington, D.C., International Monetary Fund) (1992).
- Guitián, Manuel, "Rules and Discretion in Monetary Policy," in Frameworks for Monetary Stability—Policy, Issues, and Country Experiences, eds. Tomás J. T. Baliño and C. Cottarelli, pp. 19-41 (Washington, D.C., International Monetary Fund) (1994).
- Guitián, Manuel, "Currency Boards and Gold," (remarks to a Conference on Gold and International Markets, 1995, sponsored by the World Gold Council (New York, March 10, 1995) (1995).

- Gunasekera H.A. de S., From Dependent Currency to Central Banking in Ceylon: An Analysis of Monetary Experience 1825-1957 (The London School of Economics and Political Science, London) (1962).
- Halpern, Lazlo, and Charles Wyplosz, "Equilibrium Exchange Rates in Transition," Center for Economic Policy Research Discussion Paper No. 1145 (1994).
- Hanke, Steve H. and Alan Walters, "Currency Boards" in The New Palgrave Dictionary of Money and Finance, Vol 1., ed., Peter Newman, Murray Milgate and John Eatwell, The MacMillan Press Ltd., 1992 (pp. 558-561).
- \_\_\_\_\_, and Kurt Schuler, "Keynes' Russian Currency Board" in S.H. Hanke and A.A. Walters, Capital Markets and Development (Institute for Contemporary Studies Press, San Francisco) (1991).
- \_\_\_\_\_, and Kurt Schuler, Currency Boards for Developing Countries (International Center for Economic Growth, San Francisco) (1994).
- Ho, Thomas S. Y., and Anthony Saunders, "The Determinants of Bank Interest Margins: Theory and Empirical Evidence," Journal of Financial and Quantitative Analysis, Vol. XVI, No. 4 (November 1981).
- Hong Kong Monetary Authority, "Monetary and Exchange Rate Management with International Capital Mobility: The Case of Hong Kong," Quarterly Bulletin (February 1995).
- Honohan, Patrick, "Currency Board or Central Bank? Lessons from the Irish Pound's Link with Sterling, 1928-79," Centre for Economic Policy Research Discussion Paper 1040 (October 1994).
- Humpage, Owen F. and Jean M. McIntire, "An Introduction to Currency Boards," Federal Reserve Bank of Cleveland, Economic Review, Second Quarter, 1995.
- International Monetary Fund, "Djibouti: Institutional Aspects of Monetary Management," Appendix III of SM/96/78.
- \_\_\_\_\_, "Payments System Reform: Economic Efficiency, Systemic Risk, and Monetary Management," SM/96/225.
- \_\_\_\_\_, "Republic of Lithuania—Staff Report for the 1994 Article IV Consultation and Review of the Stand-By Arrangement," EBS/94/60, March 1994.
- \_\_\_\_\_, "Macroeconomic Consequences and Causes of Bank Unsoundness," SM/96/40, Supplement 1.

- \_\_\_\_\_, "Argentina—Staff Report for the 1993 Article IV Consultation and Review under the Extended Arrangement," EBS/93/101, June 1993.
- \_\_\_\_\_, "Republic of Lithuania—Recent Economic Developments," SM/96/128, June 1996.
- Kaminsky, Graciela L., and Carmen M. Reinhart, "The Twin Crises: The Causes of Banking and Balance-of-Payments Problems," *International Finance Discussion Papers*, Board of Governors of the Federal Reserve System, No. 544 (March 1996).
- Kiguel, Miguel, and Nissan Liviatan, "The Business Cycle Associated with Exchange Rate Based Stabilization," *World Bank Economic Review*, pp. 279-305 (1992).
- Klein, Michael W., and Nancy P. Marion, "Explaining the Duration of Exchange-Rate Pegs," *NBER Working Paper No. 4651* (February 1994).
- Krugman, Paul, "A Model of Balance-of-Payments Crises," *Journal of Money, Credit and Banking*, Vol. 11, pp. 311-325 (1979).
- Liviatan, Nissan, "Introduction to the Proceedings of a Conference on Currency Substitution and Currency Boards," *World Bank Discussion Papers* 207 (1993).
- Machinea, Jose Luis, "The Argentine Financial Crisis of 1995: Causes, Characteristics and Lessons," Mimeo, January 1996.
- McKinnon Ronald I., "Optimum Currency Areas," *American Economic Review*, Vol. 53, No. 53 (September 1963).
- \_\_\_\_\_, and Huw Pill, "Credible Liberalizations and International Capital Flows: The Over-Borrowing Syndrome," Mimeo, Stanford University (March 1995).
- Mecagni, Mauro, "Experience with Nominal Anchors," in *IMF Conditionality: Experience Under Stand-By and Extended Arrangements, Part II: Background Papers*, ed., by Susan Schadler, Occasional Paper 129 (Washington: International Monetary Fund, September) pp. 65-95, 1995.
- Mundell, Robert A., "A Theory of Optimum Currency Areas," *American Economic Review*, Vol. 51, pp. 657-665 (September 1961).
- Obstfeld, Maurice, "The Logic of Currency Crises," *NBER Working Paper No. 4640* (February 1994).
- \_\_\_\_\_, "Models of Currency Crises with Self-fulfilling Features," *NBER Working Paper No. 5285* (October 1995).

- \_\_\_\_\_, "Destabilizing Effects of Exchange Rate Escape Causes," NBER Working Paper No. 3603 (January 1991).
- \_\_\_\_\_, and Kenneth Rogoff, "The Mirage of Fixed Exchange Rates," NBER Working Paper No. 5191, July, 1995.
- Osband, Kent, and Delano Villanueva, "Independent Currency Authorities: An Analytic Primer," IMF Staff Papers, Vol. 40, No. 1 (March 1993).
- Pilling, David, "Tucumán's Monopoly Money Wages," Financial Times, February 13, 1996.
- Rebelo, Sergio, and Carlos Vegh, "Real Effects of Exchange Rate-Based Stabilizations: An Analysis of Competing Theories," in NBER Macroeconomics Annual 1995 (MIT Press), 1995.
- Richards, Anthony, and Gunnar Tersman, "Growth, Nontradables, and Price Convergence in the Baltics," IMF Working Paper WP/95/45 (April 1995).
- Rodríguez, Carlos A., "The Argentine Stabilization Plan of December 20th," World Development, 1982, 801-811.
- \_\_\_\_\_, "Money and Credit Under Currency Substitution," IMF Staff Papers, Vol. 40 (June 1993), pp. 414-26.
- Rojas Suárez, Liliana and Steven R. Weisbrod, "Towards an Effective Regulatory and Supervisory Framework for Latin America," unpublished manuscript, Interamerican Development Bank, September 1996.
- Roldos, Jorge, "Supply-Side Effects of Disinflation Programs," IMF Working Paper WP/94/84 (July 1994).
- Saavalainen, Tapio O., "Stabilization in the Baltic Countries: A Comparative Analysis," IMF Working Paper WP/95/44 (1995).
- Sachs, Jeffrey, Aaron Tornell, and Andres Velasco, "The Collapse of the Mexican Peso: What Have We Learned?" NBER Working Paper 5142 (June 1995).
- \_\_\_\_\_, Aaron Tornell, and Andres Velasco, "Financial Crises in Emerging Markets: The Lessons from 1995," Brooking Papers on Economic Activity, No.1 (1996).
- Schwartz, Anna J. "Banking School, Currency School, Free Banking School," in New Palgrave Dictionary of Economics, London: Macmillan (1987).

- \_\_\_\_\_, "Currency Boards: Their Past, Present, and Possible Future Role," Carnegie-Rochester Conference Series on Public Policy 39 (1993).
- Sjaastad, Larry, "Dollarization and Real Interest Rates," in Proceedings of a Conference on Currency Substitution and Currency Boards, World Bank Discussion Papers 207 (1993).
- Stoker, J. "Intermediation and the Business Cycle Under a Specie Standard: The Role of the Gold Standard in English Financial Crises, 1790-1850," University of Chicago (1994).
- Viner J., Studies in the Theory of International Trade, Chicago: University of Chicago Press (1937).
- Williamson, John, What Role For Currency Boards? Policy Analyses in International Economics No. 40, Institute for International Economics (September 1995).
- Zarazaga, Carlos E., "Argentina, Mexico, and Currency Boards: Another Case of Rules versus Discretion," Federal Reserve Bank of Dallas, Economic Review, Fourth Quarter (1995).

