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# A survey of the institutional and operational aspects of modern-day currency boards

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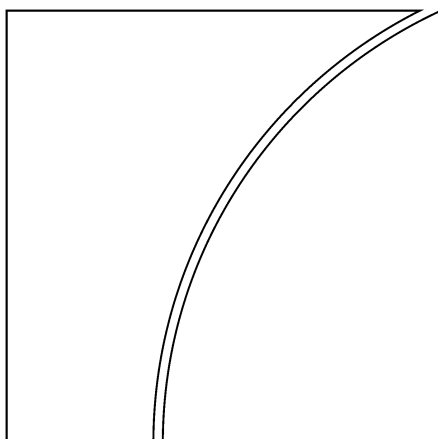
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### Abstract

This paper surveys the institutional and operational features of the six modern currency boards. The survey is developed around three key aspects: organisation, operations and legal foundation. By laying out the facts, this survey seeks to shed light on how and why modern currency boards in practice are different from the classic definition, and to distil from their features an updated definition and the revised "rules of the game".

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# 1. Introduction<sup>1</sup>

This paper surveys the institutional and operational features of the six modern-day currency boards<sup>2</sup> – those of Hong Kong, Argentina, Estonia, Lithuania, Bulgaria, and Bosnia and Herzegovina. It documents how and why modern currency boards are different from the classic blueprint in three interrelated dimensions: organisation and design, operations, and legal framework. In doing so, this paper brings out two intertwined themes: the trade-offs inherent in the mechanics of a currency board and the importance of adaptation – even in a rule-bound policy regime.

After having all but disappeared by the 1960s, currency boards made a comeback in the 1990s as an alternative and often controversial policy option for emerging market economies.<sup>3</sup> Discussions on this second generation of currency boards are typically at the level of policy ideology, macroeconomic consequences and regime choice optimality. The lack of resolution in these debates could arguably be due to, at least in part, the lack of a thorough understanding of this institution at a more basic level.

For conceptual purposes, currency boards are usually portrayed using the classic description: 100% reserve backing, conversion of domestic currency into reserve currency (and vice versa) on demand, no lending, no discretion. Yet, the currency boards that sprang up in the last decade or so, with their various non-traditional features, are hardly as simple as this description suggests.

The discrepancy between the classic definition and modern-day practice has occasionally prompted some debate as to whether the “currency boards” we see nowadays are truly currency boards or something else. The literature has invented terms such as “currency board-like”, “quasi-currency board”, “modified currency board” and “non-orthodox currency board” to describe the phenomenon. To the extent that a currency board is typically perceived to be an *institution-based* approach to achieving and maintaining monetary stability, deviations from the familiar classic blueprint may indeed appear to be a potential cause for concern. But the question is: is *any* deviation from the classic blueprint necessarily inappropriate?

The premise of this paper is that the intellectual and policy discussions of currency boards can be made more productive if we first come to terms with the need to *update* the definition of the institution.

There are several fundamental reasons why modern currency boards *cannot* be literal replicas of their historical counterparts. First, the function of currency boards has broadened. Earlier currency boards were simply a mechanism to transform a metropolitan currency (mainly sterling) into a form that was convenient for local use, a practical solution to the rather mundane problem of currency issuance, typically in a colony. In the modern, post-colonial context, however, they are an alternative approach to conducting monetary policy. Second, the political and economic landscapes have changed. Modern currency board economies are independent sovereign entities, not colonies.<sup>4</sup> They have no recourse to a parent country and are expected to take responsibility for their own monetary affairs. Furthermore, with the increasing importance of the banking sector and exposure to international capital flows,

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<sup>1</sup> This paper is an expanded version of a chapter of my doctoral dissertation at Princeton University. I thank Peter Kenen, Claudio Borio, Gabriele Galati and Agustin Villar for their comments. Special thanks to Shu-ki Tsang for helpful conversations on the topic. All remaining mistakes are mine.

<sup>2</sup> This survey is based on information as of 2001. Meanwhile, the currency board regime in Argentina ended in January 2002, in the context of a serious economic and political crisis. Nonetheless, Argentina’s decade-long experience is highly valuable as an illustration of various practical aspects of modern currency boards.

<sup>3</sup> Currency boards originated in the mid-19th century and proliferated among mainly British colonies through the early decades of the 20th century. After World War II, many newly independent countries sought to shed their colonial past by replacing their currency boards with central banks. The intellectual atmosphere of the time also contributed to the decline of this monetary institution. According to Schuler (1992), Edward Nevin’s 1961 book, *Capital funds in underdeveloped countries: the role of financial institutions*, was the final nail in the coffin for the original wave of debates on currency boards. Nevin argued that monetary policy can be effective even in less developed countries and that central banking could spur economic development more effectively than currency board systems. In 1983, Hong Kong was the first economy to revive the use of a currency board. But the topic did not receive much international attention until Argentina and Estonia adopted the currency board mechanism as the cornerstones of their macroeconomic stabilisation programmes in 1991 and 1992, respectively.

<sup>4</sup> Hong Kong is a special case. It was a colony and is still not politically independent. Nonetheless, it has long been a recognised economically and financially sovereign entity.

modern currency board economies must deal with issues that were either non-existent or relatively insignificant in the historical context.

Given their wider responsibilities and the more complex environment, currency boards cannot plausibly accomplish their 21st century duties efficiently relying only on 19th century mechanics. This is why modern currency boards ought to exist in adapted forms. A stricter or more “orthodox” currency board is not necessarily better. Nonetheless, how and to what extent the basic blueprint of a currency board can or should be adapted is yet another question, with the answer depending on the particular circumstances of individual economies.

This paper illustrates this point by taking stock of the basic institutional and operational facts of modern currency boards. Section 2 examines the cross-country similarities and differences in *organisation and design*, paying particular attention to the roles of the respective monetary authorities and the structures of their balance sheets. Organisational features have implications for *operations*, which are reviewed in Section 3. Currency conversion, liquidity management and lender of last resort operations are considered in turn. The latter two types of operations are often generically branded as “discretionary”, contentiously at odds with the rule-based principles of a currency board. Yet, practical experience suggests that this branding is based on an overly simplified characterisation of “discretion”. Finally, since its explicit *legal basis* is often regarded as a distinguishing feature of a currency board regime, Section 4 surveys the similarities and differences in the form and content of the six legal frameworks represented. It also discusses whether a “currency board law” is an effective commitment device. Section 5 concludes.

By laying out the facts, this paper seeks to shed light on how the new generation of currency boards are organised and operate at the dawn of the 21st century, and distil from their features an updated definition and the revised “rules of the game”. This paper should also be interesting in that it covers all six modern currency boards, providing a comprehensive review. Furthermore, its approach from the institutional/operational angle distinguishes it from most of the existing literature on currency boards and should be of interest to researchers and practitioners alike.<sup>5</sup> Nonetheless, while this approach should help promote a more realistic understanding of the strengths and limitations of the currency board mechanism in the modern context, it does not fully address the broader question of the optimality of the regimes represented.

Before proceeding to the survey, this introduction concludes with an outline of the “classic blueprint” of a currency board.

### ***The classic blueprint***

As currency boards made their way back into academic and policy discussions in the early 1990s, many turned to the handful of scholars who were familiar with historical currency boards for a definition of this seemingly exotic monetary institution. Walters and Hanke (1992) write in their entry in *The New Palgrave Dictionary of Money and Finance*:

... the board stands ready to exchange domestic *currency* for the foreign reserve currency at a specified and fixed rate.... there can be no fiduciary issue. The backing to the currency must be at least 100 percent.... The convertibility of currencies and the 100 percent reserve currency backing requirement in the currency board system do not extend to bank deposits or any other financial assets. If a person has a bank deposit and wishes to use the currency board to convert it to foreign currency then the deposit must be first converted into domestic currency and then presented to the currency board.

Williamson (1995) illustrates the characteristics of a currency board by comparing the stylised balance sheet of a typical currency board with that of a typical central bank (see figure below). On the liabilities

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<sup>5</sup> Earlier works tend to focus on the history and economic implications (pros and cons) of currency boards (eg Schuler (1992), Schwartz (1993), Williamson (1995)). Later surveys, eg Baliño, Enoch et al (1997), cover the topic rather broadly, including both modern currency boards and their surviving historical counterparts. Enoch and Gulde (1997) provide a normative discussion of the preconditions for making a currency board operational. Works that document the institutional and operational details of individual currency boards exist (typically produced by the respective central banks), but surveys covering all six modern currency boards are rare (eg Tsang (1999), which compares the six legal frameworks).

side, a central bank issues domestic currency notes and coins (cash), and takes reserve deposits from the domestic banking system (usually subject to reserve requirements). A currency board also issues notes and coins, but it is not essential that it take reserve deposits from the banking system.<sup>6</sup>

Currency board	
Assets	Liabilities
Liquid foreign reserves	Notes and coins  (Deposits from banks)  Net worth

Central bank	
Assets	Liabilities
Liquid foreign reserves  Domestic currency assets, eg government debt	Notes and coins  Deposits from banks  Net worth

On the assets side, a typical central bank holds both foreign reserves and domestic assets (eg government securities). It can perform foreign exchange interventions and other market operations, extend domestic credit and act as the lender of last resort. In contrast, a currency board holds *only* foreign reserves<sup>7</sup> as backing to its convertible monetary liabilities (“base money”). This leaves no scope for a currency board to perform operations that involve the use of domestic currency assets.

In fact, in contrast to a central bank with discretionary capabilities, a currency board can be thought of as a rule-based money-changing machine. It issues and redeems base money *on demand* against the reserve currency at some prescribed conversion rate. It does not perform active foreign exchange interventions, sterilise reserve flows, inject or withdraw domestic currency liquidity or extend domestic credit at will like a typical central bank. The *stock* of convertible base money is always fully backed by foreign reserves; implicitly, the *flow* of base money is also matched one to one by the flow of foreign reserves.

There are two fine points that this classic caricature does not usually elaborate on.

First, even though a currency board is often generalised as a kind of exchange rate “peg”, it is not mechanically equivalent to a conventional central bank with a peg. Section 3.1 provides a more detailed explanation on how the currency board mechanism induces a “fixed” exchange rate without having to behave like a conventional central bank.

Second, in purely mechanical terms, the “stock” backing rule is the simplest self-sufficient condition to guaranteeing the feasibility of *redemption* at any given moment. The “flow” rule is automatically satisfied in redemption. However, there is in principle no mechanical barrier to *issuance*, except the constraint of the stock rule. Issuing base money strictly against the receipt of foreign reserves helps to enforce the stock rule; however, this does not per se guarantee the feasibility of redemption if the stock rule is not satisfied to begin with. On the other hand, if there are excess foreign reserves, the flow rule could be relaxed up to some point without compromising the ability to honour redemption. The flow rule is neither sufficient nor always necessary for guaranteeing convertibility.

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<sup>6</sup> Traditionally, a currency board did not have the responsibility of managing interbank settlements. It was therefore not operationally essential for the banking system to keep its reserves at the currency board. Commercial banks could hold their reserves in the form of vault cash and liquid reserve currency assets. Banks might not even be subject to any formal reserve requirements. Some currency board advocates considered this to be the “pure” currency board arrangement.

<sup>7</sup> Often assumed to mean liquid reserve currency assets. However, in historical practice, these may include gold and silver as well as marketable securities denominated in foreign currency (typically the reserve currency).

Thus, there could be two interpretations of the “rules of the game” of a currency board: (1) a currency board should observe *both* the stock and the flow rules at all times; or (2) a currency board should observe the stock rule at all times. The first interpretation guarantees convertibility and leaves absolutely no room for “discretionary” manoeuvre. The second interpretation guarantees convertibility but allows some flexibility, the extent of which depends on the amount of excess foreign reserves available. The classic or what some authors refer to as “orthodox” currency boards typically assume the first interpretation. However, as the survey in the subsequent sections will reveal, both interpretations have been applied in modern practice. It will also become apparent that a more “orthodox” or stricter currency board is not necessarily better.

## 2. Organisation and design

A currency board is often conceptualised as an automatic “money-changing machine”, a “non-central bank”, with a simple balance sheet: notes and coins on one side, foreign reserves on the other. However, modern-day practice proves to be quite different. This section compares the classic blueprint to the organisation and design of modern currency boards, paying particular attention to the roles of the respective monetary authorities and the structures of their balance sheets.

### 2.1 The role of the central bank

In the early 1990s, some commentators, influenced by their knowledge of history, took the adoption of a currency board to imply the abolition of the existing central bank. They were thus surprised to see that countries such as Argentina and Estonia adopted monetary mechanisms that resembled currency boards but did not abolish their central banks. They regarded Hong Kong’s currency board (established earlier in 1983) to be more “authentic” since there was not a formal central bank in the territory.<sup>8</sup> In addition, at the time, only Hong Kong dollar notes and coins were subject to the formal backing rule and banks did not hold reserves at the Exchange Fund. All these features made Hong Kong’s arrangement look very much like a classic currency board. Some of these commentators also grew disillusioned as it eventually became clear that even monetary management in Hong Kong was becoming more and more “central bank-like”.<sup>9</sup> Nonetheless, by the mid-1990s, the practice of operating a currency board via a central bank became accepted or at least tolerated – except by a handful of currency board purists.

Given our limited experience with currency boards since the 1960s, it is easy to understand why this implicit assumption that a central bank should not coexist with a currency board prevailed in the early literature. In their heyday in the early 20th century, currency boards were not called central banks; and when they were later abolished, they were replaced by central banks. Yet, history can mislead us for several reasons.

First, while it is true that former colonies abandoned their currency boards in favour of central banks as part of the process of achieving political independence, the revival of currency boards in the 1990s was not the *reversal* of this process. With the exception of Hong Kong, which was a colony to begin

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<sup>8</sup> For a long while, some people also classified Singapore as a currency board country, owing to the existence of a Board of Commissioners of Currency and no “central bank” (apparently, a “monetary authority” did not count). The fact is, even though the note-issuing institution remains intact, the currency board conversion rule ceased to apply after the Singapore dollar was floated in 1973.

<sup>9</sup> Since 1988, a series of reforms had allowed the Exchange Fund to take over from the Hongkong and Shanghai Banking Corporation (HSBC) both the centre position of the banking system and the control of interbank liquidity. Schwartz (1993) commented that such developments represented “a dilution of features that distinguished the institution”. Friedman (1993) remarked, at an event commemorating the 10th anniversary of Hong Kong’s linked exchange rate system, that it was a “mistake” to convert “the pure currency board from 1983 to 1988” into a “central bank”. Interestingly, at around the same time, the newly established Hong Kong Monetary Authority (HKMA) published a book called *The practice of central banking in Hong Kong*. With the benefit of hindsight, however, the real problem with Hong Kong’s monetary system at the time was not the establishment of a central bank-like entity per se, but rather the failure to adapt its narrowly defined “pure currency board” adequately to suit the modern financial environment.

with, all other candidates for currency boards were and continued to be independent nations<sup>10</sup> (Table 1). Thus, it was wrong to assume that the adoption of a currency board should necessarily lead to the dismantling of the national central bank.

Table 1  
**Modern currency boards: background information**

	Hong Kong	Argentina	Estonia	Lithuania	Bulgaria	Bosnia and Herzegovina
Year of inception	1983	1991	1992	1994	1997	1997
Political status at inception	British colony	Independent	Newly independent	(Newly) independent	Independent	Independent
Current status	SAR, <sup>1</sup> China	Independent	Independent	Independent	Independent	Independent
Previous regime	Floating	Floating	Rouble area	Floating	Floating	Mixed
Reason for inception <sup>2</sup>	Restore confidence	Macro stabilisation	Macro stabilisation	Macro stabilisation	Macro stabilisation	Postwar re-construction
Authority in charge	Exchange Fund <sup>3</sup>	BCRA <sup>4</sup>	Bank of Estonia	The Bank of Lithuania	Bulgarian National Bank	CBBiH <sup>5</sup>
(year established/independent)	(1935)	(1935)	(1919/1990)	(1922/1990)	(1879/1991)	(1997)

<sup>1</sup> Special Administrative Region. <sup>2</sup> Except for Hong Kong and Bosnia and Herzegovina, the stabilisation efforts of the other economies included fighting high to hyperinflation. <sup>3</sup> The Exchange Fund became a part of the Hong Kong Monetary Authority (HKMA) in 1993. <sup>4</sup> Banco Central de la República Argentina. <sup>5</sup> Central Bank of Bosnia and Herzegovina.

Second, the policy alternatives in the two eras are not comparable. In the historical case, the alternative to adopting a currency board was not establishing a central bank, but employing some other form of currency issuance and circulation.<sup>11</sup> In the modern context, by contrast, currency boards are adopted as an alternative way of conducting monetary policy, or an alternative exchange rate regime,<sup>12</sup> typically lodged in a central banking framework.

Furthermore, the role of a central bank is sometimes oversimplified in discussions. Although monetary policymaking is the most prominent aspect of its responsibilities, the foundations of a central bank are arguably built upon its role as the “bank of banks” (ie the manager of interbank settlements). So while there might have been dissatisfaction with central banks’ conduct of monetary policy, it would be costly and impractical to dismantle the centrepiece of the domestic financial infrastructure, given the major

<sup>10</sup> Many of the peculiarities of Hong Kong’s monetary system are attributable to the territory’s colonial past and non-independent present. The fact that Hong Kong is comparatively advanced in financial development, with a relatively stable economic and political history, also explains many of the contrasts with the other currency board economies. Thus, Hong Kong’s system is not a representative example of modern currency boards. Nonetheless, its evolution provides valuable lessons on the differences between the classic and the modern setups of currency boards.

<sup>11</sup> The alternatives included adopting the metropolitan currency, using silver coins issued by major trading partners, and relying on privately issued banknotes.

<sup>12</sup> The choice of exchange rate regime for an individual economy was arguably not an important issue in the historical context, given the prevalence of global arrangements (eg gold standard, later Bretton Woods).



role of banks and other financial entities in the modern context.<sup>13</sup> Thus, upon the adoption of a currency board regime, the central bank, if one exists, is likely to be *adapted* rather than *abolished*. The monetary policy role is reduced, but the importance of other supporting functions is not diminished (see Section 3). It may not be an accident that even Hong Kong's "authentic" currency board evolved to become more "central bank-like" as the complexity of the financial environment grew over time, or that Bosnia and Herzegovina's currency board was in fact introduced by establishing a brand new central bank.

## 2.2 The currency board account

Having explained the continued, albeit adapted, role of central banking, it is easy to see why the balance sheets of the authorities in charge of modern currency boards resemble, to various extents, those of conventional central banks. In addition to the familiar items (notes and coins, foreign reserves), there are items that are not explicitly included in the classic representation of a currency board or are assumed to be forbidden. One may find, for example, account balances of banks and the government, various foreign currency liabilities (deposits, debts, IMF-related items, etc), central bank paper and even some domestic currency assets (loans, securities, etc). Some of these non-classic items were inherited from the previous regime; others were introduced at or after the inception of the currency board regime.

Since a currency board is typically seen as a mechanism to implement a monetary rule in the modern context, what ultimately matters is not merely the appearance of the balance sheet, but that its contents reflect the functioning of the mechanism. As outlined above in the introduction, the "rules of the game" require that all convertible monetary liabilities be fully backed by foreign reserves. This "stock" backing rule continues to be a central feature of modern currency boards. Table 2 compares the backing rules of the six modern currency boards. The wording and details may differ, but the essence is the same: monetary liabilities (notes, coins and banks' account balances, ie the monetary base) should be fully covered by foreign reserves. A seeming exception is Hong Kong, where the written rule requires only the coverage of the Certificates of Indebtedness (CIs), which are the legal backing of Hong Kong dollar banknotes (issued by the authorised note-issuing banks);<sup>14</sup> however, practice extends the foreign reserve coverage obligation to the entire monetary base.<sup>15</sup>

The authorities in charge have also made efforts to provide alternative presentations of their accounts, published at least monthly,<sup>16</sup> to better demonstrate their observance of the backing rule. Table 3 shows the main features of the six currency board accounts. The practices of the authorities represented fall into two broad categories. Those of Hong Kong, Argentina and Bulgaria publish separate accounts highlighting the subset of components that are directly relevant to the backing rule, while the others treat the overall account of the central bank as the currency board account.

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<sup>13</sup> In principle, it is possible to decentralise the various functions of a central bank. For example, prior to the establishment of the HKMA in 1993, the full range of activities (eg policy, note issuance, backing, interbank settlement, banking supervision) existed, but they were performed by separate public and private entities. Until the introduction of real-time gross settlement (RTGS) in 1996, the HSBC (a private commercial bank) was still in charge of interbank settlement. Even today, note issuance is still delegated to the authorised commercial banks. However, note that this dispersion of functions was practicable for Hong Kong mainly because it did not have a central bank to begin with.

<sup>14</sup> This narrow backing rule, enshrined in the Exchange Fund Ordinance, dates back to the first currency board regime of 1935.

<sup>15</sup> Owing to the absence of a fully fledged central bank, the standard definition of "monetary base" was, for a long time, not applicable to Hong Kong. Until 1988, currency (in the form of CIs) was the only monetary liability of the authorities. Bank reserves were held at the HSBC, the then manager of the clearing house. Between 1988 and 1996, the aggregate balance of the banking system was indirectly held by the authorities via an account the HSBC was required to keep on the books of the Exchange Fund. With the introduction of RTGS in 1996, banks began to keep their accounts directly on the books of the Exchange Fund. A standard "monetary base" took shape, but was not officially defined until the currency board system was reformed and refined in 1998. Now, the monetary base comprises currency (CIs and coins), the aggregate balance of the banking system as well as Exchange Fund Bills and Notes (since they are mainly used as collateral and thus a potential source of liquidity).

<sup>16</sup> Bulgaria also publishes weekly the balance sheet of the Issue Department. Argentina also publishes some key figures on a daily basis (with a two-day lag).

Table 2  
Main features of backing rules

	Hong Kong	Argentina	Estonia	Lithuania	Bulgaria	Bosnia and Herzegovina
Source reference	Exchange Fund Ordinance <sup>1</sup>	Convertibility Law (Art 4)	Law on the Security of the Estonian Kroon	Law on the Credibility of the Litas	Law on the Bulgarian National Bank (Art 28)	Law on the CBBiH (Art 31)
Backing assets	Reserve funds <sup>2</sup>	Freely available reserves <sup>3</sup>	Gold and convertible FX reserves	Gold and FX reserves in convertible currencies	Gross int'l FX reserves in convertible currencies	Net FX reserves <sup>4</sup>
Liabilities to be backed	Certificates of Indebtedness (CIs) <sup>5</sup>	Monetary base	Kroons in circulation	Litas in circulation	Aggregate monetary liabilities	Aggregate monetary liabilities

<sup>1</sup> This ordinance is not a formal “currency board law” like those of the other countries, hence its contents are not specific to a modern currency board. <sup>2</sup> The law allows reserve funds to be held in domestic or foreign currency (cash or assets), or in gold or silver. In practice, a designated portfolio of liquid US dollar assets is used. <sup>3</sup> Defined as “gold and foreign reserves”. <sup>4</sup> Total foreign exchange assets net of liabilities to non-residents. <sup>5</sup> The law only requires that CIs, the legal backing of Hong Kong dollar banknotes, be backed with reserve funds. In practice, the whole monetary base is backed.

This difference in practice seems to be related to the size of the central bank’s overall balance sheet and the length of pre-currency board history of the central bank as an independent entity (refer to Table 1). The authorities of Hong Kong, Argentina and Bulgaria have comparatively larger balance sheets and longer pre-currency board histories. To the extent that many pre-existing assets and liabilities cannot simply be discarded with the adoption of a new policy regime, there is a case for differentiating between those items that are relevant to the currency board mechanism and those that are not.<sup>17</sup>

Argentina’s Convertibility Law (Article 5) requires that the central bank modify its balance sheet to distinguish the “freely available reserves” from the other assets and to highlight the “monetary base”. The Bulgarian National Bank was reorganised into three departments at the inception of the currency board regime. Since the Issue Department is solely responsible for running the currency board, its balance sheet is the relevant account.<sup>18</sup> Hong Kong updated its practice in 1999 by publishing a separate monthly “currency board account” of the Exchange Fund, showing only the designated US dollar backing portfolio (as distinct from the much larger investment portfolio and other assets) and the now well defined monetary base.<sup>19</sup>

<sup>17</sup> “Irrelevant” assets are those that are not usable as backing, while “irrelevant” liabilities are those that are not subject to the standing offer of convertibility. They may be inherited from the previous regime or related to the ongoing “non-monetary” activities of the central bank. For example, loans and debts, shares in and obligations to international organisations, financial services for the government or other public entities, longer-term investment portfolios, physical assets.

<sup>18</sup> The other two departments are Banking and Banking Supervision. Estonia also adopted this Bank of England-style separation of the Issue Department from other departments at the inception of its currency board regime in 1992, but reconsolidated later.

<sup>19</sup> The structure of the Exchange Fund’s balance sheet is one of a kind. As of end-2000/early 2001, over 80% of total assets were foreign currency assets (over USD 110 billion, ranked third in the world), of which only about 25% would be sufficient to cover the monetary base in full. The portfolio of liquid US dollar assets designated for this purpose was about 28% of foreign currency assets. Total liabilities were only 70% of total assets. See also footnote 15 for details on the monetary base.

Table 3  
Main features of currency board accounts<sup>1</sup>

	Hong Kong	Argentina	Estonia	Lithuania	Bulgaria	Bosnia and Herzegovina
Relevant account (as % of overall balance sheet <sup>2</sup> )	Currency board A/C balance sheet  (25%)	Int'l reserves and monetary liabilities  (55%)	Monthly balance sheet  (100%)	Monthly balance sheet  (100%)	Issue Dept balance sheet  (60%)	Monthly balance sheet  (100%)
<b>Liabilities</b>						
Currency <sup>3</sup>	✓	✓	✓	✓	✓	✓
Banks' A/Cs <sup>4</sup>	✓	✓	✓	✓	✓	✓
Other accounts <sup>5</sup>			✓	✓	✓	✓
IMF-related			✓	✓		✓
Paper <sup>6</sup>	✓		✓			
Repos		✓ (net)		✓		
Other liabilities	Interest payable Net account <sup>7</sup>		Liabilities to non-residents Foreign debt FX deposits Others	Liabilities to non-residents Other liabilities	Interest payable Banking Department deposit	Liabilities to non-residents Other liabilities
<b>Assets</b>						
FX reserves <sup>8</sup>	✓	✓	✓	✓	✓	✓
Gold		✓	✓	✓	✓	
IMF-related			✓	✓		✓
Reverse repo				✓		
Other assets	Interest receivable Net account <sup>9</sup>	ALADI <sup>10</sup>		Claims on government, private sector, banks Other assets	Interest receivable	Other assets

<sup>1</sup> This table shows only items that are explicitly listed in the accounts relevant to the backing rule. <sup>2</sup> The approximate size of the relevant account as a fraction of the overall balance sheet of the authority in charge as of end-2000/early 2001. <sup>3</sup> Notes and coins in circulation. <sup>4</sup> Account balances/deposits held by banks. May include foreign currencies; may include accrued interest. <sup>5</sup> Account balances/deposits held by other entities, including government. <sup>6</sup> Issued mainly for use as collateral. Auction of CDs in Estonia has been discontinued. <sup>7</sup> This item adjusts for Exchange Fund paper held as collateral. <sup>8</sup> Include foreign currency cash, deposits and securities. <sup>9</sup> This item accounts for unsettled transactions. <sup>10</sup> Net position versus other member central banks of the Asociación Latinoamericana de Integración, generated by trade-related payments.

Sources: Published accounts of national central banks.

In contrast, the presence of "irrelevant" components is negligible in Estonia, Lithuania and Bosnia and Herzegovina, given the relatively smaller sizes and the de novo nature of these three countries' central banks at the introduction of their respective currency board regimes. The value added to publishing separate accounts is lower since virtually *all* their liabilities (monetary and others) are covered by

foreign reserves, which constitute over 95% of total assets. For most practical purposes, the entire balance sheet is relevant. Nonetheless, these central banks also provide alternative presentations to detail the amount, composition and flow of foreign reserves.

### 2.3 Observations

Several observations are in order. First, there is considerable cross-country diversity in the organisation and design of modern currency boards, reflecting the different circumstances in which these currency boards were instituted and subsequently evolved. However, this diversity should not be exaggerated since the six economies are linked by their adoption of similar backing rules (Table 2) that conform to the basic condition for guaranteeing convertibility.

Second, since what ultimately matters for the feasibility of convertibility is that the net liquidation value of the backing assets must be no smaller than the nominal value of the liabilities that the currency board undertakes to convert at the official parity, criticisms against the presence of non-traditional items on the balance sheet may be irrelevant after all. For as long as there are fluctuations in asset valuation, even the purists' insistence that currency boards should hold only *foreign-issued* foreign currency assets may prove neither sufficient nor necessary.<sup>20</sup> In the end, the onus is on the authorities to value and present their accounts in an appropriate manner. Accordingly, owing to the difference in designs, legal conventions and accounting practices, caution should be exercised when computing and interpreting foreign reserve coverage figures.<sup>21</sup>

Operationally, the more complex structure of the balance sheets implies that modern currency boards can and do have broader responsibilities than just being a money-changing machine. For one, the prudent and efficient management of foreign reserves becomes more important than ever, so as to safeguard against the adverse effects of fluctuations in asset valuation and currency mismatch, as well as to generate interest income, ie seigniorage. Furthermore, lodged in central banking frameworks, modern currency boards take on, to various extents, the task of interbank settlement management. Since most currency boards have excess reserves, there is potentially room to operate in dimensions other than conversion without compromising the feasibility of convertibility. Nonetheless, the extent to which a currency board can or should make use of this room for manoeuvre depends on a host of other factors.

## 3. Operations

In the classic view, the only thing a currency board does (or is supposed to do) is to exchange domestic currency for reserve currency (and vice versa) on demand at the prescribed conversion rate. In modern practice, currency boards can and do operate in other dimensions that are often less well understood. In fact, even conversion can entail more intricate details than the classic description suggests. This section surveys the main cross-country similarities and differences in operations – conversion, liquidity management and lender of last resort. It explains in more detail how conversion works and what it can and cannot guarantee. It also makes the case for the need to incorporate

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<sup>20</sup> The fact that the central bank of Argentina is allowed by law to hold up to one third of its freely available reserves in dollar-denominated Argentine government securities has been viewed as a violation of the 100% foreign reserve requirement. For example, Hanke and Schuler (1999) and their other writings often highlight this "unorthodox" arrangement. However, since all items including these government securities must be marked to market, what matters is the total market value of these backing assets, regardless of the nationality of the issuer. But to the extent that Argentine government securities may be vulnerable to wider fluctuations in value, including them as backing assets may make reserve management more difficult than necessary.

<sup>21</sup> For example, in Hong Kong's currency board account, the reserve ratio is artificially constrained to 105–112.5%. Surpluses (deficits) resulting from fluctuations in asset valuation and net interest receivable are automatically transferred to (replenished from) the sizeable investment portfolio of the Exchange Fund. Another example: if there are current foreign currency liabilities in the relevant account (this applies to all except Hong Kong), then, strictly speaking, only the net foreign assets are available to cover domestic monetary liabilities. The fact that published balance sheets are often not explicit about their currency and maturity structures also makes interpretation and flow analysis rather challenging.

appropriately designed liquidity management and even last resort lending tools into the modern “rules of the game”.

### 3.1 Conversion

The defining characteristic of a currency board is that it is obliged to maintain convertibility, ie a standing offer to issue or redeem domestic currency monetary liabilities at a prescribed parity vis-à-vis the reserve currency. This demand-driven mechanism continues to be the basis of modern currency boards, but there are some variations in the details. These are summarised in Table 4.

	Hong Kong	Argentina	Estonia	Lithuania	Bulgaria	Bosnia and Herzegovina
Official parity <sup>1</sup>	HKD 7.80 = USD 1.00	ARS 1.00 = USD 1.00	EEK 8.00 = DEM 1.00	LTL 4.00 = USD 1.00	BGN 1.00 = DEM 1.00	BAM 1.00 = DEM 1.00
Obligation to redeem base money	Yes <sup>2</sup>	Yes	Yes	Yes	Yes	Yes
Obligation to issue at official rate	CIs and coins only	De facto yes	De facto yes	Yes	Yes, with maximum 0.5% spread	Yes
Direct access	Banks	Banks	Banks	Banks	Banks and non-banks	Banks

<sup>1</sup> DEM anchors will be officially stated in EUR in 2002. Lithuania plans to switch to a euro anchor on 2 February 2002, at the ECB reference EUR/USD rate of 1 February 2002, ie no re- or devaluation on impact. <sup>2</sup> Except for the Exchange Fund Bills and Notes component of the monetary base.

Sources: National legislations; central bank publications.

As expected, all modern currency boards have clearly defined obligations to *redeem* their monetary liabilities, which include not only notes and coins but also current balances (mainly those held by banks). This extension of convertibility beyond notes and coins is natural and essential in the modern context, since interbank activities and non-cash means of payment play a much more substantial role than in the historical context.

In contrast, practices regarding the *issuance* of base money exhibit some cross-country variations. Not all currency boards explicitly oblige themselves to buy the anchor currency at the official parity. For example, in Argentina the law states that the central bank may purchase foreign exchange at market price, while in Estonia base money is to be issued “fully secured” by foreign reserves, but not explicitly “at the official rate”. Nevertheless, in practice, these two countries’ central banks do provide two-way convertibility at the official parity. In Hong Kong, only the cash component of the monetary base is guaranteed two-way convertibility. The bank reserves component is explicitly guaranteed to be redeemable at HKD 7.80 to the USD, but the Exchange Fund retains discretion over the price at which it purchases US dollars in exchange for the issuance of HKD bank reserves. This means that the market bid rate for HKD will be extremely close to 7.80, but the ask rate can potentially be stronger. Exchange Fund Bills and Notes are part of the fully backed monetary base but are not issued or redeemed on demand.<sup>22</sup> Bulgaria also has an asymmetric conversion rule: the central bank sells the anchor currency at parity, but buys with a spread of at most 0.5%. The rationale for asymmetry is

<sup>22</sup> Exchange Fund Bills and Notes are primarily used as collateral for intraday and end-of-day liquidity. The outstanding stock of these types of paper is programmed to grow in line with interest accrued on them. This helps to avoid undue fluctuations in the amount of available collateral.

probably based more on pragmatism than on operational necessity: it reflects a stronger emphasis on guarding against depreciation than appreciation; it potentially leaves room to detect market pressure and/or to create a bid-ask spread in favour of the central bank.<sup>23</sup> Asymmetry also implies that the “flow” backing rule would not be strictly satisfied since the currency board gains more reserve currency per unit of base money issued than it loses per unit of base money redeemed.

### **Conversion rate vs exchange rate<sup>24</sup>**

Another point of interest is that direct access to conversion transactions with the currency board is in practice typically limited to resident banks. This means that, absent additional arrangements, the *official conversion rate* does not apply to interbank and retail transactions. Thus, the *market exchange rate* of the domestic currency against the anchor currency continues to be determined by market forces and can potentially fluctuate. Nonetheless, deviations of the interbank rate from the official rate can be mitigated if the currency board’s standing offer to buy/sell bank reserves is coupled with adequate competition and arbitrage among market players.<sup>25</sup> In this sense, a currency board is an automatic and very cost-effective mechanism for maintaining a fixed exchange rate. Instead of relying on active intervention (ie fighting the market on its own) to offset deviations of the market rate, as a central bank with a peg typically does, a currency board uses the simple but powerful incentives inherent in its mechanics to mobilise a set of market players to do the work on its behalf.

Under normal circumstances, any dealing bank would have little incentive to quote a “worse” price on the interbank market, since at least the resident banks would never hit this price (they can always obtain a better price at the currency board). And if the market is competitive enough, there would always be some banks willing to undercut this price. Thus, no bank would ever hit this price. Similarly, a bank would have little incentive to quote a “better” price, since there is a threat that at least the resident banks could profit at its expense by arbitraging between this price and the currency board’s price. And since resident banks would never want to quote a “better” price either, then even banks with no direct access to the currency board could potentially engage in arbitrage. In any case, market deviations from the official price should be temporary and small if this mechanism functions and if transaction cost is small – even without any active involvement of the currency board.

In times of intense selling pressure, the widening of the market bid-ask spread, by itself, may not generate sufficient incentives to arbitrage away the deviations from the official rate instantly. However, since a sell-off would ultimately contract the money supply, domestic interest rates would increase, which, when combined with the unattractive bid price for the domestic currency, would eventually make it too costly to continue selling. Again, this adjustment does not require any active intervention by the authorities.

How well this mechanism performs largely depends on the market infrastructure and conditions. Thus, market exchange rate fluctuations do not necessarily reflect limitations on the currency board’s ability or commitment to fulfil its own obligations. Nonetheless, to the extent that modern currency boards are typically seen as an alternative way to fix the exchange rate, excessive deviations of the market rate from the official rate do reflect the inefficiency of the *system* as a whole in maintaining exchange rate stability.

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<sup>23</sup> This can help cover administrative cost and/or deter frivolous transactions. Allowing for the possibility of a spread also helps keep alive interbank trading activities in the domestic currency-anchor currency pair.

<sup>24</sup> Having a currency board does not automatically imply having a market-traded domestic currency. However, if the domestic currency is traded, the market exchange rate will be linked to the official conversion rate via the behaviour of market participants.

<sup>25</sup> To the extent that banks want to profit from their retail foreign exchange business, it is unlikely that the retail rate will be identical to the official rate. Nonetheless, if the retail market is sufficiently competitive, exchange rate deviations can be kept in check. Extending the official rate to retail transactions by law, as done in Bosnia and Herzegovina, is also a possibility. Allowing the non-bank public access to the currency board for cash transactions at the official rate, as done in Bulgaria, is another way to ensure that the retail rate stays in line. In Argentina, exchange bureaus can access the official parity via their banks; the non-bank public may buy/sell US dollars at the official parity at the Banco de la Nación.

### ***Convertibility at the currency board vs convertibility at the system-wide level***

One frequently voiced concern is that guaranteeing the convertibility of base money does not seem sufficient in the event of a mass sell-off of domestic currency deposits for foreign currencies. On this point, it is important to recall that bank deposits, which typically form the bulk of the broad money supply, are the liabilities of the domestic banking system, not of the currency board. From the point of view of the currency board, provided that it plays by the 100% backing rule, it should always be able to meet its own obligations, regardless of the magnitude of the selling pressure. A unit of base money is always worth the prescribed amount of anchor currency. The next question then is: is the banking system always able to guarantee that one unit of deposit is as good as one unit of convertible base money (or the corresponding amount of anchor currency)?

Since modern banking systems are typically leveraged, this one-to-one transformation of deposits is not always guaranteed, regardless of whether there is a currency board or not. But in the case of a currency board, the problem is potentially compounded by the fact that, owing to the backing rule, a currency board is limited in its ability to provide liquidity assistance.<sup>26</sup> A mass sell-off of domestic money would imply the contraction of both broad and base money, which, at the limit, would lead to the complete implosion of the money supply.<sup>27</sup> While this contraction is a normal part of the adjustment mechanism, it can be potentially very painful. The banking system, if sufficiently vulnerable, could grind to a halt long before the complete implosion stage is reached. So while a currency board can be a cost-effective mechanism for maintaining exchange rate stability, the tight link between the currency board and the banking system that enables this mechanism to work could be a source of systemic risk in times of stress. Nonetheless, this trade-off can be improved if proper precautions are taken. There is an extra-strong case for sound liquidity management so as to ensure that the spirit of “convertibility” is not compromised from a *system-wide* perspective.

### **3.2 Liquidity management**

The topic of liquidity management is seldom dealt with in detail in the mainstream literature on currency boards. In fact, the classic view of currency boards simply assumes that there is neither any role nor any scope for operations other than currency conversion. This is clearly not the case in modern practice. Table 5 summarises the main features of the liquidity management tools available in the six modern currency board economies as of early 2001.

The point of contention is that, to the extent that the instruments involved appear to smack of the “discretion” associated with conventional central banking, they are often also considered to be unnecessary and undesirable, at odds with the rule-based nature of a currency board.

Such criticisms are not completely unfounded but are misguided in several respects. First, while certain types of “discretion” are clearly incompatible with the working principles of a currency board,<sup>28</sup> it does not follow that *any* activity other than currency conversion is unnecessary or undesirable. Interbank activities are the lifeblood of a modern banking system. Therefore, some form of liquidity management is a basic necessity, regardless of the policy regime – currency board or not.

Furthermore, as a currency board cannot undo or ameliorate changes in the liquidity position of the banking system as liberally as an unconstrained central bank, this leaves the system potentially more prone to fluctuations, especially at times of large capital flows. Proper liquidity management is thus essential for the smooth functioning of a currency board *system* (see Section 3.1).

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<sup>26</sup> If the currency board has excess foreign reserves, it is technically feasible to inject domestic currency liquidity in times of need and still stay within the bounds of the stock backing rule. However, if the strict interpretation of the “rules of the game” is applied, then this room for manoeuvre will not be available. See Sections 3.2 and 3.3 for more on liquidity assistance.

<sup>27</sup> Not that such an implosion is in any way desirable, but at least in principle, if the multiplier process is allowed to unwind fully, broad money would be reduced to convertible base money, and the currency board would never run out of reserves even in the face of a mass sell-off.

<sup>28</sup> For example, not maintaining 100% foreign reserve backing, or making ad hoc changes to the official parity.

Table 5  
Main features of liquidity management facilities (as of early 2001)

	Hong Kong	Argentina	Estonia	Lithuania	Bulgaria <sup>1</sup>	Bosnia and Herzegovina <sup>2</sup>
Reserve requirements	No	Liquidity requirements	Yes + add'l liquidity requirem'ts	Yes	Yes	Yes
Reserve ratio, base, maintenance		20%, all deposits, 1 month	10% + 3%, wide range, 1 month	8%, deposits < 1 year, 1 month	8%, all deposits, 1 month	10-15%, all BAM liabilities, 10 days
Remuneration		No/Yes <sup>3</sup>	Yes <sup>4</sup>	No	No	Yes <sup>5</sup>
Standing lending facilities	Overnight repo  Intraday repo	Overnight repo  Advances and rediscounts <sup>7</sup>		Overnight lending <sup>6</sup>		
Standing deposit facilities		Overnight reverse repo <sup>8</sup>	Yes <sup>9</sup>			
Other facilities				Fine-tuning facilities <sup>10</sup>		

<sup>1</sup> Bulgaria's central bank law (Article 33) prohibits the extension of credits to banks except in instances of systemic liquidity risk. <sup>2</sup> The Law on the CBBiH (Article 37) prohibits money market operations involving securities of any type. <sup>3</sup> Not by the Banco Central; however, the requirements can be satisfied by holding reserves in remunerated forms abroad. <sup>4</sup> At ECB rate. <sup>5</sup> At market rate, on amounts in excess of 5% of requirement. <sup>6</sup> In case of end-of-day shortage of funds. Collateralised. <sup>7</sup> In case of temporary lack of liquidity. Amount up to net capital of borrowing bank, duration up to 30 days. 125% guarantee required. <sup>8</sup> Automatic at end-of-day, equivalent to a form of remuneration. <sup>9</sup> This is basically the remuneration of excess required reserves and of all additional liquidity requirements. <sup>10</sup> Market-based reversed transactions and fixed-term deposits.

Sources: National central banks.

The abuse of the term "discretion" and the incorrect attribution of "discretion" to all aspects of central banking also add to the confusion.<sup>29</sup> While it is true that a central bank can inject or withdraw liquidity via discretionary (central bank initiated) operations, such as open market operations, the same results can also be achieved via non-discretionary (counterparty initiated) standing facilities.

In fact, the conversion mechanism of a currency board can be thought of as a standing facility that conducts demand-driven purchases and sales of foreign exchange. By the same principle, a currency board can also facilitate demand-driven injections and withdrawals of liquidity. Hong Kong, Argentina and Lithuania have standing facilities that provide overnight liquidity.<sup>30</sup> However, in order to make such facilities functional *and* at the same time compatible with the backing rule, eligible paper denominated and/or realisable in the anchor currency needs to be available. For example, in Hong Kong, the Exchange Fund issues fully backed bills and notes expressly for this purpose. The central bank in Estonia had issued CDs intended for the same purpose, but eventually discontinued the auctions since it opted not to provide lending facilities.

<sup>29</sup> This observation is very much related to the influential literature on monetary policy and central bank credibility and the rules versus discretion debate. The term "discretion" is often taken to mean the polar opposite of "rules". It evokes the unconstrained opportunism à la Kydland and Prescott (1977) and Barro and Gordon (1983). Since a currency board is a rule-based institution, it is often caricatured as "anti-discretion" – any discretion.

<sup>30</sup> Hong Kong also has an intraday liquidity facility. Banks in Argentina are expected to use their liquidity requirement resources to meet their intraday needs.



In addition to or in lieu of *responding* to liquidity shortages via standing facilities, liquidity management can also take the form of *preventing* such shortages from building up in the first place. Directly requiring or otherwise inducing banks to hold larger reserves helps build a thicker cushion to safeguard the system against scrambles for liquidity and sharp spikes in interest rates.<sup>31</sup> All modern currency board countries, except Hong Kong,<sup>32</sup> have some form of reserve or liquidity requirements, coupled with averaging over the maintenance period, to provide more flexibility. The strategy of cushion-building is especially apparent in Argentina, Estonia and Bosnia and Herzegovina, where the deposit bases covered are broad and the requirement ratios are high. Some forms of direct or indirect remuneration of reserves are also in place to entice banks to hold excess reserves and to compensate them for the “tax” associated with reserve requirements.<sup>33</sup>

The possible approaches to liquidity management are many. The choice ultimately depends on the structural characteristics of the financial system and the incentive structure that banks face.<sup>34</sup> The choice should also take into consideration the central bank’s rapport vis-à-vis the banking system and its attitude towards “intervening” in the interbank market.<sup>35</sup> Beyond market factors, political constraints, past experiences and future directions also play a role in shaping the choice. For example, the overriding concern to maintain political and monetary unity in postwar Bosnia and Herzegovina makes it sensible for the central bank to refrain from non-essential interaction with the financial system. Past experience with the abuse of central bank credit prompted some countries (eg Bulgaria) to opt for a reduced role of the central bank in liquidity management, but possibly at the expense of more volatility in the interbank market. Hong Kong’s colonial past explains much of the peculiar evolution of its liquidity management practices. The prospect of joining the European Union and eventually EMU may exert some influence on the liquidity management techniques of the currency boards in central and eastern Europe: the eventual adoption of a fuller range of instruments may be inevitable even if the currency board framework is to remain intact.

There is certainly no unique formula. This is why the six modern currency boards take rather different approaches to liquidity management. More importantly, this is also why having fewer supporting facilities – or being more “orthodox” – does not necessarily make a better currency board system. The use of non-classic facilities and instruments per se need not be a problem, provided that their designs are compatible with the working principles of a currency board and suit the particular needs and constraints of the economy.

### 3.3 Lender of last resort

Perhaps the most contentious issue in the debate on currency boards is that of last resort lending. The classic view asserts that a currency board has neither the ability nor the authority to be the lender of last resort (LOLR). By ruling out the possibility of last resort lending altogether, abuse and the inflationary consequences thereof can be avoided. However, this also leaves the domestic banking system potentially vulnerable to systemic liquidity crises.

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<sup>31</sup> In order to build an effective cushion, reserves held need to be usable for interbank transactions. Averaging of reserve requirements over the maintenance period also helps make the demand for reserves more elastic and thus smoothes out fluctuations in interbank interest rates. And since the main idea is to have sufficient liquidity on hand, traditional reserve requirements can well be supplemented or even replaced with more flexible liquidity requirements (eg in Argentina).

<sup>32</sup> As a result, the banking system’s aggregate balance held at the Exchange Fund is typically very small. However, banks in Hong Kong are more liquid than this suggests, with actual liquidity ratios far exceeding the minimum 25% prudential requirement.

<sup>33</sup> Allowing banks to use vault cash to count towards the (partial) fulfilment of reserve requirements also helps reduce the tax, but possibly at the cost of distorting the assessment of the true level of reserves available for interbank transactions. This is Lithuania’s argument for not allowing cash to count.

<sup>34</sup> These characteristics include the reserve management skills of banks, the efficiency of the interbank market and the payment system (net or real-time gross), the structural liquidity position of the system (and its volatility and predictability), the extent of currency substitution, and the availability of eligible assets as collateral. Of course, liquidity management facilities are not very useful if banks or other agents have no incentive to use them in the intended manner.

<sup>35</sup> Some central banks favour more involvement to help monitor and regulate a weak, underdeveloped or unstable interbank market; others argue for less involvement so as to foster the development of the interbank market.

In practice, the dilemma is not necessarily so stark. To the extent that there are excess foreign reserves (or access to supplementary sources of foreign reserves), it is technically *feasible* to have some last resort lending and still stay within the bounds of the stock backing rule. Whether last resort lending is or should be *allowed* is a separate question. Table 6 illustrates the official LOLR capacities of the six modern currency boards.

Table 6  
Official lender of last resort capabilities

	Hong Kong	Argentina	Estonia	Lithuania	Bulgaria	Bosnia and Herzegovina
Entity responsible	HKMA/ Financial Secretary <sup>1</sup>	BCRA/ Board of Directors	Bank of Estonia	The Bank of Lithuania	Banking Department/ Managing Board	N/A
Scope	For systemic purposes	Extraordinary circumstances	No explicit reference to LOLR <sup>2</sup>	No explicit reference to LOLR <sup>3</sup>	In case of systemic risk	The central bank "may not extend credit by creating money"
Conditions	Collateral Up to excess reserves	Collateral + controlling interest  No compromise on backing rule			Collateral  No longer than 3 months  Up to excess reserves	
Source	Policy Statement, June 1999 <sup>4</sup>	Central bank charter, Article 17; Law 24.485, Article 2.1			Law on the BNB, Articles 20 and 33	Law on the CBBiH, Article 1

<sup>1</sup> Normally, the decision is delegated to the HKMA and is based on the criteria set in the Policy Statement. If the criteria are not met, specific approval from the Financial Secretary is necessary. <sup>2</sup> Lepik (1999) writes that LOLR is in principle feasible up to the amount of excess reserves available. LOLR in Estonia is not formalised; in practice, it has been used on a case by case basis. <sup>3</sup> Tsang (1999) reports a reference to LOLR in the Law on The Bank of Lithuania (Article 8); however, it seems that this explicit reference was removed in a subsequent amendment of the Law. Nonetheless, the Bank has the right to make secured loans in litas to credit institutions (Article 27). <sup>4</sup> Using reserve funds to ensure the stability of the financial system is mandated by the Exchange Fund Ordinance. The principles of LOLR were first set out in 1994. However, a 1998 commissioned study reported that there was "quite a high degree of misunderstanding among bankers on whether the HKMA is the lender of last resort and what this role involves". The June 1999 Policy Statement was issued to clarify.

Of the six currency boards, only Bosnia and Herzegovina has provisions that explicitly rule out last resort lending (in fact, any lending, at least for the first six years) by the central bank. Hong Kong, Argentina and Bulgaria have provisions that expressly allow collateralised last resort lending, up to the amount of excess foreign reserves available. Estonia and Lithuania have no formal provisions but can potentially extend last resort lending on a case by case basis.

As with liquidity management, this capacity to lend in emergency situations has attracted criticisms. Some critics have argued that a LOLR is unnecessary, citing the good track record of earlier currency board systems. The absence of a LOLR is certainly not a problem if the domestic banking system is sound and/or relatively sheltered from adverse shocks and/or has access to external sources of

assistance.<sup>36</sup> However, these conditions cannot be taken for granted in the modern context. It is now more widely accepted that, when the banking system is leveraged and subject to uninsurable systemic risks, having some form of LOLR (be it with official or private resources) is beneficial for the sound maintenance of the regime by protecting convertibility at the system-wide level<sup>37</sup> and by reducing the propensity for having simultaneous currency and banking crises (“twin crises”).

The “discretionary” flavour of LOLR is of particular concern. Some discretion is inevitable since judgment must be used, at least to determine if a certain situation qualifies for “last resort” action. Even so, discretion need not mean indiscriminate liberty. To begin with, some aspects of the LOLR regime can be spelt out as a part of the rules. For example, pledging to lend only up to the amount of excess reserves and specifying the range of acceptable collateral put an upper bound on the scope of last resort lending. Furthermore, it is important to distinguish between *use* and *abuse*. Last resort lending becomes problematic when it is viewed as lending of first – or only – resort, which often happens when the meaning of “last resort” is unclear and when the scope of central bank lending is ill-defined and/or susceptible to manipulation. Efforts to pin down or at least draw some boundaries around the conditions under which lending can be conducted should help reduce the risk of abuse. Furthermore, to the extent that systemic problems sometimes arise as a result of coordination failures among economic agents, last resort lending, as a device to contain systemic risk, is meaningful only if both the banks and the non-bank public clearly *understand* whether, when and how resources are to be provided.<sup>38</sup>

In short, the mere existence of the LOLR *option* does not necessarily mean that it will be abused or even used. Ultimately, beyond the tangible rules and conditions that govern LOLR, good judgment and trust still matter. The negative view of last resort lending and the very strict provisions against lending in some countries are in fact a response to past instances of abuse and a reflection of deep-rooted mistrust. Thus, as with liquidity management, having more scope for last resort lending (or any lending) does not necessarily mean a less disciplined or less well run currency board system.

There are also complements and alternatives to the limited *official* LOLR capacities of modern currency boards. Opening the market to foreign banks that presumably have recourse to emergency funds from their overseas headquarters or parent organisations can potentially reduce the reliance on domestic official sources of funds. Negotiating and maintaining contingent credit lines with foreign banks and/or central banks, as done in Argentina, is also a possibility.

Nevertheless, in the end, prevention is better than cure. In fact, the authorities may find it more difficult to extend last resort lending precisely at times of system-wide distress, either because excess foreign reserves are running low or because such extraordinary action may be indiscriminately misinterpreted as “breaking the rules”. Sound banking supervision and prudent liquidity management on an everyday basis are ever more important.

#### 4. Legal foundations

A currency board’s legal basis is often recognised as a distinguishing feature that makes its commitment to a fixed parity more credible than a conventional exchange rate peg. This section examines the main similarities and differences in the form and content of the legal frameworks of the six modern currency boards,<sup>39</sup> and sheds some light on whether a “currency board law” is an effective commitment device.

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<sup>36</sup> The model in Ho (1999) explores how the strength of the banking system (measured by its ability to command extra financial resources when needed) and the exposure to shocks affect the likelihood of having a speculative attack and/or a collapse of a rule-abiding currency board when there is no local official lender of last resort.

<sup>37</sup> See, for example, Caprio et al (1996), who conclude that LOLR is a logical necessity for the maintenance of a unified exchange rate among all classes of domestic money.

<sup>38</sup> Hong Kong’s experience is a case in point. See footnote 4 in Table 6.

<sup>39</sup> Tsang (1999) provides more factual details.

## 4.1 Framework

Broadly speaking, the legal frameworks of the six modern currency boards fall into three categories (Table 7). The currency boards of the early 1990s (Argentina, Estonia, Lithuania) have separate “currency board laws” in addition to their respective central bank laws.<sup>40</sup> The later currency boards (Bulgaria, Bosnia and Herzegovina), which were externally imposed by multilateral agencies, have the relevant details directly incorporated into the central bank laws.<sup>41</sup> Hong Kong, with neither a separate law nor incorporated provisions of comparable form and detail, is in a class of its own. In the light of the belief that what makes a currency board more credible is that it is a legally binding commitment, not just an unsubstantiated promise, Hong Kong’s lack of *specific* references has raised a few eyebrows. However, it should be noted that Hong Kong’s currency board is *no less lawful* than the others, as it is fully consistent with, albeit not literally dictated by, the Exchange Fund Ordinance, which governs the establishment, objective and management of the Exchange Fund and the powers of the Financial Secretary over monetary matters.<sup>42</sup>

Table 7  
Main features of legal foundations (as of early 2001)

	Hong Kong	Argentina	Estonia	Lithuania	Bulgaria	Bosnia and Herzegovina
Basis of legal system	Common law	Civil law	Civil law	Civil law	Civil law	Civil law
Legal reference to currency board	N/A	Convertibility Law	Law of the Republic of Estonia on the Security of the Estonian Kroon	Law on the Credibility of the Litas	Law on the Bulgarian National Bank, Ch 5	Law on the CBBiH, Chs 1 and 4 Constitution, Article VII
With explicit details on:						
Full backing		✓	✓	✓	✓	✓
Anchor currency		✓	✓		✓	✓
Official parity		✓			✓	✓
Guarantee of convertibility		✓	✓	✓	✓	✓
Main supporting provision	Exchange Fund Ordinance	Central Bank Charter	Law on the Central Bank of the Republic of Estonia	Law on The Bank of Lithuania		

Sources: CIA World Factbook; national legislations.

<sup>40</sup> Possibly also amended or even rewritten at the inception of the currency board regime.

<sup>41</sup> In the case of Bosnia and Herzegovina, the term “currency board” is explicitly used in the law.

<sup>42</sup> This Ordinance first came into being in 1935, when the earlier currency board regime (1935–74) was set up. Since the framework it provides is fairly general, it is compatible with various types of monetary regime. The return to having a currency board in 1983 did not contradict the Ordinance; thus, no new law needed to be passed. As a result, the legal basis of Hong Kong’s regime is not deliberately and specifically designed as those of the other modern currency board regimes. The Basic Law, a constitutional document of the Hong Kong Special Administrative Region (effective 1 July 1997), also has references to Hong Kong’s monetary regime (Articles 110–113), but it basically reiterates the continuation of the pre-handover status quo, as already outlined in the Exchange Fund Ordinance.

The degree of detail provided by the relevant legislation also varies. The laws of Argentina, Bulgaria and Bosnia and Herzegovina have very detailed and specific provisions governing the key aspects of their respective currency boards and more. The laws of Estonia and Lithuania are also designed to support currency convertibility but somewhat less detailed.<sup>43</sup> Attitudes towards operations other than currency conversion also seem to be less restrictive, with fewer explicit prohibitions. Since Hong Kong's Exchange Fund Ordinance is not specifically tailored to a modern currency board regime, it is not comparable in form and content to the currency board laws of the other countries.

Perhaps one can ask why some currency boards have very explicit legal foundations while others do not. One possible, but often overlooked, reason is that countries have different legal systems and traditions. All currency board economies, except Hong Kong, have legal systems based on civil law, in which laws must be explicitly written into a collection of statutes for both the public and judges to follow. In contrast, Hong Kong, like many other former and present British colonies, has a legal system based on common law, which exists and applies on the basis of historical legal precedents developed over time. There are also written statutes (the Exchange Fund Ordinance is one), but the codification of very detailed laws arguably need not be as central an emphasis in such a system as in a civil law-based system, where written laws are the only guide to go by.<sup>44</sup>

Cross-country variations in the form and content of legal frameworks are also attributable to the different circumstances in which each currency board came into being. For example, a currency board that is established in a pre-planned fashion (eg Bulgaria and Bosnia and Herzegovina) can be expected to have a more detailed and comprehensive legal framework than one that is instituted as an emergency measure (the original idea for Hong Kong). There is arguably also a "time trend" effect: by the time Bulgaria and Bosnia and Herzegovina adopted their new regimes in 1997, currency boards were already better known and studied than they had been in the early 1990s. By then, a detailed legal framework was assumed to be an indispensable part of the design and it was no longer acceptable to be any less specific than the regimes established before (from Hong Kong to Lithuania). Thus, omissions or apparent "loopholes" in the law may be purely circumstantial. How loose or strict the legal framework is should not be taken literally as an indicator of commitment or credibility. In fact, the degree of restrictiveness in the law could well be endogenously determined by past experiences with abuse or fears of abuse: it is precisely those regimes with less credibility that need the support of a stronger framework.

## 4.2 The value of the law

If the legal language *per se* is not a comprehensive indicator of commitment and credibility, then is a currency board law a commitment device at all, as typically claimed? To answer this question, we need to prove that if the laws had not been in place, the currency board would not have been maintained. Proving this comprehensively would be impossible. Nonetheless, looking across the six modern currency boards, we do observe that a less stringent framework does not appear to be associated with less commitment (eg Hong Kong, Estonia).

Having strict laws may not be a necessary condition for commitment, but is it sufficient? The typical argument says that if the policy regime is enshrined in law, the cost of reneging on the policy promise will be higher than if the regime is unsubstantiated by the written law. It takes both time and effort to change the law, and, in the process, serious political and economic consequences may result. All these are supposed to deter ad hoc changes in policy.

While deterrence may be *relatively* higher compared to the case of no legal constraint, whether it is high enough in *absolute* terms to be an effective commitment device is still an open question. For one, laws must be enforced and observed to be effective. Regardless of the literal restrictiveness of the

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<sup>43</sup> For example, Estonia's law states that the official exchange rate will be determined with respect to the Deutsche mark, but it does not indicate the exact parity (to be determined by the Bank of Estonia). The exchange of kroons into foreign currency at the official rate is explicitly guaranteed, but the reverse is only implicit in Clause 4. In Lithuania, neither the anchor currency nor the official exchange rate is specified (The Bank of Lithuania retains the right to determine both).

<sup>44</sup> In fact, since historical currency boards existed mostly in British colonies, which mostly also used common law, one wonders if an explicit currency board law is really an essential element of an "authentic" currency board, as claimed by the purists.

legal framework, the rule of law is essential. Furthermore, written laws *can* be changed – sometimes more easily than one would think.<sup>45</sup> Occasional amendments to the relevant laws are not uncommon among modern currency board economies. In fact, there is often nothing substantial to rule out the possibility of changes, be they minor or major, benevolent or malevolent. Moreover, laws typically only outline how the currency board is to be organised and how it is to operate; the legal consequences of not playing by the rules are usually not explicitly stated anywhere. What legal action, if any at all, the public can take against the sovereign government in the event of a violation is also unclear. Thus, the commitment effect of the law may not be so obvious after all. Legal constraints may help to deter ad hoc changes in policy, but they do not provide an inviolable guarantee of commitment. Factors other than the letter of the law may matter more sometimes.

Nevertheless, there is still much scope for the written law to make a valuable contribution via its role as an *information* device. Spelling out in black and white how the regime is to be organised and to function gives more tangibility to policy intentions. It also provides a guide for the authorities' actions and for the public's evaluation of the regime's operation. This point is especially relevant in the case of a currency board regime since the "rules of the game" define the regime. And to the extent that these rules may need to take into account more complex contingencies in the modern context, spelling them out clearly is all the more important for all parties involved.

## 5. Concluding remarks

While modern currency boards are clearly more complex than the classic blueprint and exhibit much cross-country diversity, they are nonetheless based upon the same mechanical principle of conversion. Like their historical counterparts, modern currency boards continue to rely on this principle to issue fully backed base money. Moreover, coupled with sufficient competitive and arbitrage forces among market participants, modern currency boards also serve as an automatic and cost-effective mechanism for maintaining a stable exchange rate of the domestic currency.

However, this mechanism has limitations that become especially apparent in the context of a modern financial system. As discussed in Section 3.1, while convertibility at the level of the currency board is easy to guarantee, convertibility at the system-wide level is not. Thus, there is a potential trade-off between the efficiency of a currency board as a monetary anchor and systemic risk. Bluntly put, the simple but rule-bound mechanics of a currency board are arguably not really compatible with fractional reserve banking. Nonetheless, this observation needs to be qualified in three ways.

First, there are measures one can take to ameliorate the risk and thus improve the trade-off. The basic mechanics could be supplemented with suitably designed liquidity management tools and last resort lending facilities. Indeed, adaptation is important – even in a rule-based regime. A stricter or more "orthodox" currency board is not necessarily better. That said, whether and to what extent a country should make use of any available room for manoeuvre is another question, with the answer depending on, among other factors, the purpose of opting for "rules". A stricter interpretation of the "rules of the game" is sensible if it is deemed necessary to constrain the monetary authority's actions for reasons beyond the maintenance of convertibility (eg in Bosnia and Herzegovina, policy neutrality and unity are considered to be crucial in the context of postwar reconstruction). Otherwise, a more flexible interpretation, subject to the maintenance of convertibility, may be more appropriate.

Finally, despite the possibility to adapt, a currency board is still a constrained mechanism. To evaluate the optimality of a currency board regime, one must weigh the mechanical trade-offs against a host of other, possibly less tangible, costs and benefits. After all, a modern currency board is seldom an end in itself, but only a means to an end.

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<sup>45</sup> For example, Argentina's Convertibility Law was modified with relative ease in June 2001, despite an opposition-controlled Senate. The central bank was to continue to guarantee the redemption of pesos at the prescribed parity. However, instead of the one-to-one parity with the dollar, the new parity would be  $ARS\ 1 = USD\ 0.50 + EUR\ 0.50$ . Extending the anchor to include the euro was a response to the inappropriateness of the dependence on a 100% dollar anchor. The new law was to come into effect only when the euro would have reached parity with the dollar, so as not to generate a devaluation on impact. An interesting question is: did this change in the law necessarily reflect a lack of commitment?

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