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**Ilkka Korhonen**

Currency Boards in the Baltic  
Countries: What have we learned?

Bank of Finland  
Institute for Economies in Transition  
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All opinions expressed are those of the author and do not necessarily reflect the views of the Bank of Finland.

likka Korhonen\*

## Currency boards in the Baltic countries: What have we learned?

### Abstract

Straightforward exchange rate arrangements known as currency boards have gained popularity during the past decade. Among transition economies, Estonia first introduced a currency board in 1992, followed by Lithuania in 1994 and Bulgaria in 1997. Currency boards have been useful in achieving macroeconomic stabilization, and they may have helped the Baltics become the first countries of the former Soviet Union (FSU) to achieve economic growth after the slump in production of the early 1990s. Moreover, Baltic inflation performance has been substantially better than in other FSU countries. Both in Estonia and Lithuania, the present exchange rate system has been accompanied by strong real appreciation of the currency. Both in Estonia and Lithuania the present exchange rate system has been accompanied by strong real appreciation of the currency, although it is widely accepted that the currencies were very much undervalued at the beginning of their pegs. However, if rapid real appreciation is accompanied with increases in the labor productivity, the present pegs can be maintained. Banking crises in Estonia and Lithuania have not been particularly severe, so apparently rigid currency pegs have not been accompanied by excessive financial sector instability. The tight fiscal policies pursued in both countries, especially Estonia, have been instrumental to the success of these currency board arrangements.

**Keywords:** Exchange rate, currency board, Baltic countries

JEL E5, E6, P2

## 1 Introduction

This paper examines currency boards in two Baltic countries, Estonia and Lithuania. Estonia was the first transition economy to introduce a currency board system in 1992. Disputes still persist as to why Estonia chose a currency board. While it was initially regarded as a peculiarity, the record now shows that the currency board arrangement has served Estonia well. Indeed, few would have expected in June 1992 that the Estonian currency board would still exist with its original exchange rate of eight Estonian kroons to one Deutschmark seven years later.

Today, currency boards are no longer regarded historical peculiarities. Argentina had adopted one even before Estonia. Lithuania, Bulgaria and Bosnia–Herzegovina have all adopted currency boards, and the pros and cons of a currency board for Russia and others have been debated. Some experts argue that that, in the long run, only polar exchange rate regimes – either free float or a currency board – are feasible. Therefore it is of interest to examine in detail how long-standing currency boards have worked.

On the basis of experience recently gained, the currency board is at least an alternative worthy of serious consideration. However, the two Baltic countries with currency boards, Estonia and Lithuania, are small and little known. What is their actual experience? Have they managed economic policy better than, say, Latvia, their common neighbor? Though Baltic countries have distinct histories, structures and policies, comparing Estonia, Latvia and Lithuania comes about as close to a laboratory experiment as is usually possible in the social sciences. And if, as is the case in Estonia and Lithuania, a currency board and good macro performance go hand in hand, is there a causality? Why does Estonia want to retain the currency board, while Lithuania has announced it will exit from the arrangement? Can conclusions be drawn for other countries?

This paper argues that currency boards have increased the credibility of economic policies by limiting the discretionary powers of monetary authorities. Favorable macroeconomic developments, however, also depend on many other aspects on economic policymaking. Countries must also make progress in, for example, corporate restructuring and governance. Thus, merely implementing a currency board does not guarantee higher economic welfare, it must accompany comprehensive economic reforms. Because of its institu-



tional rigidity and credibility the currency board can function as an important element in these reforms.

The paper is organized as follows. In the second section we examine the characteristics of a currency board system and look at the implications it has for the conduct of economic policies. The third section surveys briefly the history of currency boards from the 19<sup>th</sup> century to the present day. In the fourth section we first look at the monetary reforms in Estonia and Lithuania. We also assess how currency boards have affected their overall economic development. The final section offers concluding remarks.

## 2 Currency board as an exchange rate arrangement

A currency board is an exchange rate arrangement whereby the monetary authority stands ready to exchange local currency for another (anchor) currency at a fixed exchange rate without any quantitative limits. The monetary authority can choose to convert only local currency notes into foreign currency (as in Hong Kong) or it can also convert the reserve deposits of commercial banks (as in Estonia).<sup>1</sup>

The commitment to exchange local currency into foreign currency without any limits means that the monetary authority must have sufficient reserves to meet even relatively large demand for foreign currency. In practice, almost all countries that have introduced currency boards have sought to maintain at least 100% backing of relevant liabilities. Moreover, in some countries the monetary authority is required by the legislation to keep at least 100% backing. For example, Estonia started with approximately 90% backing, but fairly soon was able to increase the backing to over 100% (Bennett 1992).

The required 100% backing of the monetary base means that the money supply is almost completely endogenous. Monetary base is determined by the size of the foreign currency reserves, which in turn depend on the surplus of the balance of payments. Through this link also larger monetary aggregates depend on the capital flows. (If the monetary authority has imposed reserve requirements for commercial banks, it may be able to alter the money multiplier by changing the reserve requirements, and have some control over how the capital flows affect larger monetary aggregates.) A currency board typi-

cally assumes completely free capital movements, as it is precisely these capital movements which respond to changes in money demand.<sup>2</sup> Possible restrictions on capital movements may prevent the currency board from functioning as it should.

A currency board implies a very simple rule in adjusting the monetary base, and this in turn has usually been the most attractive feature for countries considering a currency board arrangement. Currency boards have usually been introduced after severe economic and/or political crises, and in those circumstances a strict rule-based exchange rate and monetary policy regime can enhance the credibility of the domestic currency quite rapidly.

However, this credibility is acquired with costs. First of all, the nature of currency board prevents any large-scale financing of the government's budget deficit. In principle, the monetary authority could extend credit to the government insofar as it has currency reserves in excess of the minimum required by legislation. In practice, financing of the public sector is forbidden by legislation in most countries with currency boards. In other words, the government must finance its possible deficits from other sources, i.e. mainly from domestic and international capital markets. Second, the monetary authority's ability to act as a lender of last resort to the banking system is severely restricted (see Santiprabhob 1997). Analogously with the financing of the government's budget deficit, the monetary authority can, in principle, provide liquidity to distressed banks to the extent that the required backing of the monetary base is not endangered. However, any large-scale bank rescue operation is bound to require financial resources from the budgetary authorities. If the source of a banking system's difficulties is an external shock, then the absence of lender of last resort is real economic loss, but if the absence of lender of last resort gives bank managers and owners incentive to manage their banks more prudently (i.e. reduces the moral hazard problem possible in all types of insurance systems), this might actually be economically more efficient (Fischer 1997). It might even be desirable to have the possible bailout operations explicitly financed by the budgetary authorities. If the state has entered into an obligation to maintain the systemic stability of the financial system, then it is appropriate that the costs are explicitly attributed to the state budget. This makes the actual costs of such operations more transparent, and increases the accountability of the policy makers to the public.

If the currency board is perfectly credible, i.e. economic agents attach a zero probability to abandoning it, interest rates will be the at the same level as in the country of the anchor currency (barring differences in liquidity

between the two markets). If, for some reason, there is an outflow of currency, the liquidity of the banking system decreases and interest rates in the interbank market are bid up. If the currency board arrangement is truly credible, the resulting higher interest rates should attract investments into the country. When these are channeled to the banking system, its liquidity increases and interest rates are brought down to the level of the anchor country. In other words, currency board should work very much like the pre-World War I gold standard.

The currencies of almost all countries using currency board arrangements have been pegged to some major international currency. In principle, one could peg the domestic currency to a currency basket, but in practice this has not happened.<sup>3</sup> It may be that using just a single, well-known international currency as an anchor enhances the credibility of the chosen exchange rate regime, insofar as the domestic economic agents can more easily grasp the connection between the value of the anchor currency and the domestic currency than between the domestic currency and several other currencies. The anchor currency has been the US dollar in most cases, although Estonia and Bulgaria have opted for the German mark.

The main advantage of a currency board arrangement is that it gives greater credibility to the conduct of exchange rate policy. The fixed exchange rate can act as a nominal anchor during macroeconomic stabilization (as this is the reason many currency boards have been introduced), but one can also claim that it is one way to solve the time inconsistency problem of monetary policy. If unanticipated monetary policy actions can have real effects in the short-run, then the monetary authority may be tempted to inflate the economy to push unemployment below its natural level (or, correspondingly, output over its long-run potential level). Rational economic agents naturally take this temptation into account in forming their price expectations. In the equilibrium inflation is higher than in the absence of the temptation to inflate and the employment (and output) are at their long-run levels (Barro & Gordon 1983). If inflation is deemed socially costly then removing the monetary authority's temptation to inflate can be a welfare improvement. A currency board arrangement removes this temptation, as the monetary authority is denied any independence in monetary policy. Because the monetary base is usually at least 100% covered by the foreign currency reserves, the probability of speculative attack is also low. If everybody believes that the monetary authority will defend the external value of the currency even at the cost of high interest rates, and the currency board arrangement ensures that it will not run out of

foreign currency reserves in defending the currency, then the likelihood of a speculative attack is lower. An alternative view is that currency board is an institutional solution to a possible disagreement or competition between fiscal and monetary authorities.

As the currency board arrangements entail both benefits and costs to economies, it is of interest to study whether economies with currency boards have performed better than other countries. Ghosh et al (1998) studied the effects of currency board arrangement on inflation and output in all the member countries of the International Monetary Fund between 1970–1996. They found that countries with currency boards have significantly lower inflation than countries with floating or conventionally pegged exchange rates. In addition to this countries with currency boards have lower inflation volatility. Ghosh et al argue that the lower inflation is the result of lower velocity of money, which in turn is affected by the confidence of economic agents in the currency. They interpret this to mean that currency boards are associated with higher confidence, lower velocity, and thus (for a given rate of money growth) lower inflation. Countries with currency boards typically also have lower rates of money growth. In addition to these results concerning inflation in the countries with currency boards, Ghosh et al find that currency boards are associated with higher average GDP growth, although this result is not as robust as the results concerning inflation.

While it seems clear that the theoretical predictions about currency board's ability to discipline the authorities and help to solve the inconsistency problem of monetary policy are supported by empirical evidence, one should remember that during recent decades, few countries have kept their currency board arrangement in place for any significant period of time. Thus, empirical results concerning currency boards must be treated with caution.

### 3 A short history of currency board arrangements

In the 19<sup>th</sup> century currency boards were quite common in the British colonies. The first currency board was established in Mauritius in 1849 (Williamson 1995). Eventually, there were over 70 currency boards operating around the British Empire. By using a currency board arrangement instead of the pound sterling, colonial governments could keep the seignorage income for them-

selves. The reserves held by the currency boards could be deposited to earn interest (usually in London), and naturally most of the liabilities (notes and coins) were not interest-bearing.

A number of independent countries introduced currency boards before the Second World War. For example, Argentina had its first currency board from 1902 to 1914. Ireland continued to operate a de facto currency board up to 1970s (Honohan 1994). Ireland simply pegged its currency to the pound sterling; quite understandable given that Great Britain was by far its most important trading partner.

After the Second World War, many colonies gained independence, and in most instances the authorities of the newly independent countries felt that a currency board was not the most appropriate monetary and exchange rate arrangement. The ability to pursue independent monetary and exchange rate policies was deemed important for achieving economic growth, and since currency board arrangement means that exchange rate or interest rate could not be used as an active instrument in macroeconomic policy, a more flexible exchange rate arrangement was desired.

One could argue that the first modern currency board was introduced in Hong Kong in 1983. Hong Kong reintroduced a currency board arrangement after a period of heightened instability in the foreign exchange market. (For an assessment of Hong Kong's currency board see Kwan & Lui 1996). In the Hong Kong regime, the Hong Kong dollar was pegged to the US dollar and bank notes were issued by three commercial banks. The commercial banks in turn had to submit US dollars of at least equal value to the Exchange Fund in exchange for Certificates of Indebtedness. Over the years Hong Kong moved away from pure currency board arrangement. In 1988, the Hong Kong Exchange Fund acquired the right to conduct open-market operations. In 1990, it gained the right to issue treasury bills (Williamson 1995). This has prompted some analysts to doubt whether Hong Kong actually has a currency board. Even so, Hong Kong maintained its strict peg to the US dollar. The peg has survived the transfer of the political power to the People's Republic of China and the recent turbulence in the world financial markets, although the interest rate spread between Hong Kong and United States has been quite wide at times.

The next country to introduce a currency board arrangement was Argentina in 1991. In Argentina, the currency board was introduced after a severe bout of hyperinflation. It is perhaps not too surprising that the Argentine public was ready to give up the discretionary powers of the monetary authority

and to commit to a simple rule-based monetary policy. Introduction of the currency board was very successful in reducing inflation.

During the 1990s, currency boards have been introduced in several transition countries, i.e. countries in process of transforming their economies from a largely command-based system to a market-oriented system. The first transition country to introduce a currency board arrangement was Estonia in June 1992. Estonia was followed by Lithuania in April 1994 and Bulgaria in June 1997. The former Yugoslav republic of Bosnia–Herzegovina also introduced a currency board amidst grave political difficulties. Most transition countries have introduced a currency board in response to severe macroeconomic imbalances. The one possible exception is Lithuania where the external value of currency had been stabilized before the currency board was implemented. There, the authorities were concerned that unless a more binding commitment to the fixed exchange rate was introduced, there would be an overwhelming pressure on fiscal policy that would force the central bank to finance at least part of the resulting deficit (Camard 1996).

During the recent financial crises, currency boards have often been proposed as a remedy, but so far no large country besides Argentina has introduced a currency board. This may have something to do with the classical argument that favors fixed exchange rates for open economies. Small economies are also more likely to be open, so currency boards may be more suitable for them.

## 4 Currency boards in the Baltic countries

### 4.1 Monetary reforms in Estonia and Lithuania

The three Baltic countries regained their independence from the Soviet Union in the latter half of 1991. Lithuania was the first Baltic country to declare its independence, but Latvia and Estonia soon followed. Economic reforms actually began in the Soviet Union at the end of 1980s, and these reforms were implemented throughout the Baltics. The first commercial bank in the Soviet Union was established in Estonia in 1989 (Korhonen 1996).

One important component in the economic reforms of the Baltic countries was currency reform.<sup>4</sup> At the start of 1992 most prices were freed in Russia, and monthly inflation quickly jumped to over 30% as prices rose to eliminate the monetary overhang.<sup>5</sup> After the first initial change in the price level, the monthly inflation was approximately 10% during the first half of 1992. In June, the monthly inflation rate jumped to almost 30% and stayed there for almost five months. Naturally, the external value of ruble depreciated strongly during this period. During the first half of 1992, the Baltic countries were still part of the ruble area. The apparent instability of the ruble prompted them to look for alternative monetary arrangements. In addition, the three newly independent countries wanted to assert their independence in the monetary sphere.

Ultimately, all Baltic countries chose a fixed exchange rate regime. Estonia was first, followed by Latvia and Lithuania. In Latvia and Lithuania, the pegging of the currencies was preceded by what might be described as a managed float.

Why would a country choose to give up exchange rate as a policy instrument and opt for a regime of fixed exchange rate? The analytical literature on the desirability of fixed exchange rates can be said to begin with Mundell (1961). It is generally agreed (e.g. Isard 1995 and the references therein) that when countries are more open to foreign trade, they have more to gain from fixed exchange rates. In an open economy, changes in exchange rate translate quickly into changes in nominal wages and prices, and thus exchange rate policy is not very effective in maintaining external balance. At the same time, movements in exchange rate threaten the domestic price stability. One could argue that smaller countries are natural candidates for fixed exchange rate as they are more likely to be more open to international trade. The currency of a very small country may not be very effective in the traditional functions of money, i.e. as a unit of account and medium of exchange. For the currency of a very small country, a fix to more widely known currency could enhance its usefulness in the aforementioned functions.

Baltic economies are tiny. The annual nominal GDP in 1998 was approximately \$5.2 billion in Estonia, \$6.4 billion in Latvia and \$10.7 billion in Lithuania. These economies are also extremely open. The combined value of exports and imports in 1998 were 125% of GDP in Estonia, 81% in Latvia and 93% in Lithuania. Additionally, imports and exports of services are important for all Baltic countries. Therefore one could argue that the small Baltic countries are natural candidates for fixed exchange rates.

If a group of countries generally face dissimilar real shocks, then fixing their currencies will entail larger economic costs than letting the currencies float. A flexible exchange rate can shield a country from nominal shock originating from abroad, but a fixed regime can stabilize the effects of a domestic nominal shock. However, given the short time the Baltic countries have been independent and the immense structural change they have gone through, it is impossible to say even with the customary low degree of confidence how shocks to Baltic countries will correlate with shocks in other countries (for example, the EU and the euro area economies) in the future. Furthermore, separating nominal from real shocks is very difficult at this stage. Thus we have to rely on cruder measures of integration. One could argue that as Baltic countries are well integrated with the European Union via trade links, their economic development would be closely integrated as well.

Another factor favoring the adoption of fixed exchange rate in the Baltic countries was the widespread dollarization of the economies at the beginning of transition. When an economy is dollarized to a large extent, a fixed exchange rate may be preferable. Sudden changes in transaction use of domestic and foreign currency may produce large swings in the exchange rate. Demand for domestic money will also be more sensitive to the expected opportunity cost of holding it. In these circumstances, fixing the exchange rate can be very helpful in stabilizing the economy. In both Lithuania and Estonia the ratio of foreign currency deposits to broad money (which is one commonly used measure of dollarization) was over 20% at the time the currency board was introduced (IMF 1999). After stabilization, this ratio declined in Estonia because residents were temporarily forbidden from opening new foreign currency deposits. Currently, the ratio of foreign currency deposits to broad money is roughly 25%. In Lithuania this ratio has remained fairly high throughout the transition and stands currently at about 25%.

Choosing a regime of fixed exchange rate is not without risks. For example, the fixed exchange rate can become overvalued. If wage growth exceeds the growth in productivity for an extended period, domestic producers will lose their competitiveness in export markets. If nominal wages are inflexible downwards, then the fastest way to change real wages and restore international competitiveness is to devalue the currency.

Wages could rise exceptionally fast from large capital inflows, causing a boom in domestic lending that inflates the value of assets in the economy and creates a large increase in domestic demand. Capital flows could increase because of financial deregulation as has happened in many countries. If capi-



tal flows stop or even reverse and if domestic prices and wages do not adjust downwards, a country might either need to adjust its exchange rate or face an economic downturn. Volatility in asset prices can also cause problems in the banking sector if banks are exposed to asset prices, either directly or through their loan customers. In principle, these problems can be countered with prudent economic policies, e.g. good supervision of banks and tight fiscal policy, but in practice policymakers often find it difficult to respond in advance to imbalances.

The Baltic countries and especially Estonia can also be used as an example of this sort of asset bubble. In 1997, equity and real estate prices rose rapidly until September, after which for example the Tallinn Stock Exchange's TALSE index decreased 81% by end-1998. So far, at least, Estonia's currency board and fixed exchange rate appear to have withstood the different stages of economic cycle. In Lithuania, the inflow of foreign capital was never as pronounced as in Estonia, so the increases and decreases in asset prices were never as large.

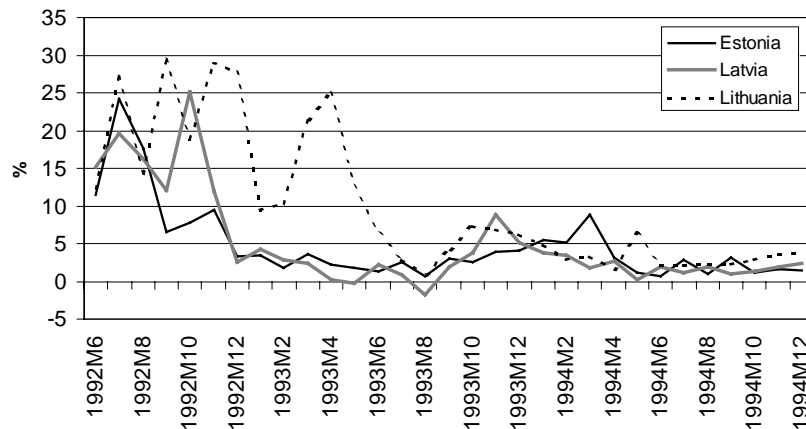
#### 4.1.1 Estonia

Estonia was the first Baltic country to introduce its own currency, the kroon. After deliberations the Estonian authorities decided to adopt a currency board system. This was regarded as a quick way to gain confidence in the currency. This consideration weighted quite heavily in the case of Estonia, which was starting a completely new currency in a complex and fragile economic and political situation.

In May 1992, the Estonian parliament passed three laws regarding monetary and exchange rate policy. These were the currency law, the law on backing of Estonian kroon, and the foreign exchange law (Eesti Pank 1992). These laws define the Estonian currency board and its operating procedures. Estonia didn't adopt the strictest possible version of a currency board as the Bank of Estonia has some discretion as to how much of the capital inflows are allowed to boost the monetary base. The Bank of Estonia has also kept minimum reserve requirements for commercial banks, something not in accordance with the strictest interpretations of a currency board system.<sup>6</sup> In any case, foreign currency reserves must at all times cover the currency in circulation and the deposits of commercial banks at the central bank (in practice Bank of Estonia has kept the reserve coverage usually at around 110%).

The Estonian kroon was pegged to German mark at rate 1DEM = 8EEK when the currency reform was carried out in June 1992. Estonia received its pre-war gold reserves (either as gold or foreign exchange) from Bank of England and other central banks. These reserves then formed the initial backing for the kroon (Bennett 1992).

Chart 4.1 Monthly inflation rates in the Baltic countries



From the beginning, the kroon was totally convertible for current account purposes. The Bank of Estonia demanded that exporters surrender their export earnings within two months, but it is not clear how strictly this was implemented. Currency deposits were allowed, but no new currency deposits were opened. Once this regulation was repealed in March 1994, Estonia essentially had achieved full convertibility of its currency and virtually free movement of capital.<sup>7</sup> The exchange rate arrangement was quite successful in bringing inflation initially down, especially when compared to other countries of the former Soviet Union, including the other two Baltic countries. Chart 4.1 shows the monthly inflation rates for the three Baltic countries from June 1992 to December 1994. One can see how Latvia and especially Estonia succeeded in bringing inflation down fairly quickly, but Lithuania struggled considerably longer with high and variable inflation. The example of Latvia shows that

lowering inflation is possible with more conventional exchange rate arrangements, although the shift in the price level during the latter half of 1992 was clearly larger in Latvia. Although the Latvian currency (first the Latvian ruble and then the lats) was floated at its introduction to spring 1994, the central bank found itself regularly intervening in the market. In spring 1994, the lats was pegged to the Special Drawing Right (SDR) of the IMF.

Further evidence of the credibility of Estonia's new exchange rate regime can be gleaned from capital movements after the introduction of the new currency. During the latter half of 1992, the Bank of Estonia's foreign assets increased by \$135 million. As this was partly caused by restoration of pre-war gold, it cannot be treated as a sign of increased confidence. During 1993, however, the foreign assets of the Bank of Estonia increased by \$133 million, almost 6% of 1993 GDP. Partly this inflow of capital can be explained by the privatization method chosen in Estonia, where many companies were sold on cash-basis to foreign investors. This took place mainly between November 1992 and November 1994 (Korhonen et al 1999). Naturally foreign investors are keenly interested in macroeconomic stability, so Estonia's currency board regime greatly contributed to this in the early years of transition.

#### 4.1.2 Lithuania

Like Latvia, Lithuania opted for a more gradual approach to monetary reform. The Lithuanian parliament accepted a law on national currency already in December 1991, but political debates about the new currency prevented Lithuania from leaving the ruble zone for quite some time. In May 1992, the Lithuanian authorities introduced an interim currency. It was simply called the "coupon", talonas in Lithuanian. The talonas was originally issued at par with the Russian ruble. In September, the authorities began to withdraw rubles from circulation, and from the beginning of October use of the ruble was forbidden. In June 1993, the authorities announced the introduction of a new currency, the litas. After July, the talonas ceased to be legal tender and the use of foreign currencies was banned. The litas was convertible for current account purposes, but Lithuania has retained more restrictions on capital account transactions than the other two Baltic countries.

In its early economic reforms, Lithuania differed from the other Baltic countries in its exchange rate arrangement. Lithuania had a dual exchange

rate system until autumn 1993. As a result of lax monetary policy (for example, between the first quarter of 1993 and the first quarter of 1994 the monetary aggregate M1 rose by 134%), inflation in Lithuania was considerably higher than in Estonia or Latvia. High inflation was naturally reflected in the external value of Lithuanian currency: the talonas depreciated markedly against the dollar up until summer of 1993, after which the tighter monetary policy succeeded in stopping the depreciation and the litas actually appreciated somewhat. Inflation came also drastically down during the summer, although there was a clear rebound in the monthly inflation towards the end of 1993.

Partly because of the observed volatility of the exchange rate and the low credibility of the monetary policy debate about the appropriate exchange rate regime intensified in autumn 1993. As a result of these discussions, Lithuania decided to adopt a currency board in March 1994. The new arrangement became effective in April, when the litas was pegged to the US dollar at a rate of 1USD = 4LTL. Even after the introduction of currency board, Lithuania continued to experience higher inflation than Estonia or Latvia, although Lithuania's inflation is currently as low as Latvia's.

The inflow of capital into Lithuania after the introduction of the currency board was as high as in Estonia's, relative to the size of the economy. In 1994, the foreign assets of the Bank of Lithuania increased by \$180 million, or almost 7% of GDP in 1994. If capital inflows are positively correlated with investor confidence in the economic policies of a given country, then the new foreign exchange rate regime in Lithuania seems to have been associated with increase in the credibility of the economic policies.

#### 4.2 The macroeconomic effects of the Baltic currency boards

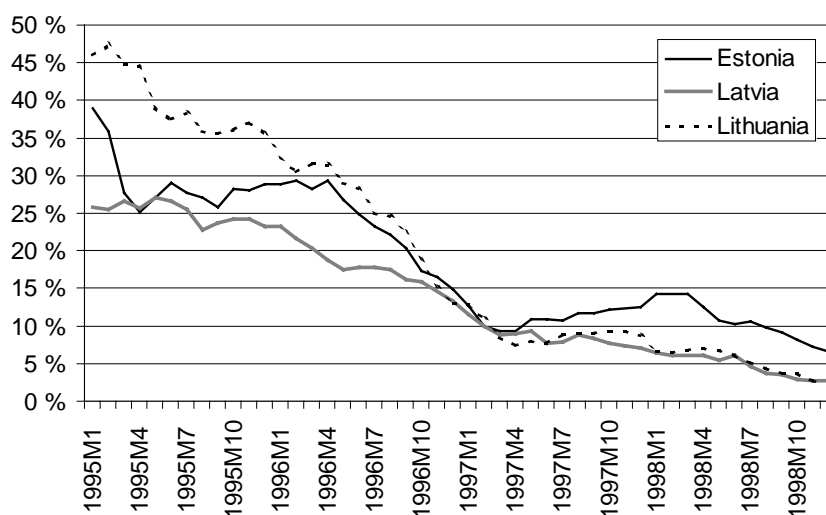
In this section we inspect the macroeconomic effects of currency board arrangements in the Baltic countries. The most interesting question is whether the countries with currency boards have better macroeconomic performance than countries with other types of exchange rate arrangements.

The success of particular policies can naturally be evaluated with many different indicators, but here I concentrate mainly on inflation and output. Inflation is relevant, because we are assessing the performance of a monetary policy rule. However, output is also an important indicator of the success of economic policies, because it is closely correlated with welfare.

Currency boards have been usually used to achieve quick stabilization in a situation of severe economic (and possibly political) imbalances. In this respect currency boards have performed very well in Estonia and Lithuania. As was seen in the section 4.1.1, the initial stabilization was achieved rapidly in Estonia. In Lithuania, the currency board arrangement has also been associated with a steady slowing of inflation. It is clear that currency boards have helped to bring inflation down, and this in turn may have had positive effect on output growth. In reducing inflation further, the track record of currency boards in the Baltic countries is mixed. For example, Latvia has been able to reduce its annual inflation to below three per cent (at least for the time being) without a currency board.<sup>8</sup>

One important macroeconomic effect of the currency boards has been their disciplinary effect on public finances. As a currency board prohibits central bank financing of the public sector deficit, it can probably be credited with the relatively low deficits in Lithuania and Estonia. (Also here one should remember that Latvia has been able to maintain low deficits without a currency board. In Estonia, the central government is forbidden from making a budget with a deficit.) However, when assessing the effects of currency boards, one is confronted with the problem of direction of causality. Did Estonia have low public deficits because it was constrained by the currency board arrangement or did the Estonian authorities deliberately seek low deficits? It seems that the Estonian authorities have been very consistent in their chosen economic policies. After regaining independence, Estonia has had one of the most liberal foreign trade regimes in the world, and so far there have been no serious attempts inside the political system to change this. Furthermore, one would be hard-pressed to find a politician who opposes the currency board arrangement, which is very much seen as a cornerstone of economic policy. This widespread support for the currency board arrangement has clearly increased its credibility. In Lithuania the support for currency board has been somewhat less enthusiastic, see for example Camard (1996) on the discussions concerning the introduction of currency board.

Chart 4.2 Annual inflation in the Baltic countries



#### 4.2.1 Inflation

The Baltic countries were the fastest among all former Soviet Union countries to reduce inflation. In Estonia, inflation is currently somewhat higher than in the other two Baltic countries, but still in single digits. Chart 4.2 shows the annual inflation in the Baltic countries from the beginning of 1995 to the end of 1998. It can be seen that Latvia has had the lowest annual inflation for some time now. Lately inflation has partly been fuelled by the administratively set prices in all Baltic countries, as their price increases have been deliberately spread over a prolonged period of time. Inflation in internationally tradable goods has usually been several percentage points lower than the headline inflation, although during 1998 the headline inflation declined to low single-digits.

What has the role of currency board been in reducing inflation in the Baltic countries? In Section 4.1.1 it was mentioned that in Estonia slowing of inflation was quite rapid after the introduction of a currency board. This was

despite the fact that the international reserves of Bank of Estonia grew, which naturally meant that also the monetary base was growing. Ghosh et al (1998) found that in countries with currency boards, the growth in money was on average lower than in other countries, but that those countries had also saw slower growth in the velocity of money.<sup>9</sup> They termed the effect currency boards have had on the rate of money growth “discipline effect” and its effects on velocity as the “confidence effect.” Table 4.1 presents calculated annual changes in velocity and money supply<sup>10</sup> in the Baltic countries and several other transition economies between 1993 and 1997. In Latvia and Lithuania, the data starts from 1994, as their national currencies were not introduced until 1993.

The change in velocity is calculated from the identity:

$$\Delta v = \Delta p + \Delta y - \Delta m$$

Where  $\Delta v$  is the change in velocity,  $\Delta p + \Delta y$  the change in nominal gross domestic product and  $\Delta m$  the change in the aforementioned monetary aggregate. The Table 4.1a shows first that in Estonia and Lithuania velocity growth has been lower on average than in many other transition economies. It is not surprising that Estonia and Lithuania have had lower velocity growth than countries like Russia and Bulgaria where inflation has been high and variable during transition. In Estonia and Lithuania, velocity growth has also been lower than in Hungary and Czech Republic, which have not experienced episodes of extremely high inflation during the period in question. One should note Latvia’s case here. In Latvia, the change in velocity is in line with the experience in the other two Baltic countries, so by this criterion the “confidence effect” has been at least as high in Latvia. One can speculate that at least in Latvia this apparent credibility in the currency and by extension monetary policy has been result of an independent central bank, which has demonstrated its preference for fixed exchange rate and low inflation.<sup>11</sup> The average growth in money supply has been quite high both in Estonia and Lithuania. In a currency board system large capital inflows translate into growth of the monetary base which in turn leads to expansion in the larger money aggregates. Here it is interesting to note that Latvia has had clearly lower growth rate of money than Estonia or Lithuania. In Latvia, the central bank has used its power to affect monetary base and ultimately inflation, but apparently to

reach lower inflation rather than boost domestic demand. Here one can also speculate what the effect of Bank of Latvia's independence has been on the conduct of monetary policy. Loungani & Sheets (1997) found that central bank independence is negatively correlated with average inflation rate also in the transition economies, i.e. similar result as in many studies concerning OECD countries. This result persists even after controlling for the stance of fiscal policy and initial conditions.

*Table 4.1a Changes in velocity 1993–1997*

	Estonia	Latvia	Lithuania	Bulgaria	Czech Rep.	Hungary	Poland	Russia
1993	-10.0 %			11.7 %	30.0 %	7.7 %	-26.7 %	13.1 %
1994	12.9 %	6.0 %	2.9 %	19.7 %	-27.2 %	13.0 %	-3.4 %	26.0 %
1995	4.1 %	13.2 %	1.3 %	12.0 %	9.6 %	19.5 %	0.6 %	15.9 %
1996	-1.6 %	1.3 %	23.5 %	-9.9 %	8.1 %	2.3 %	-10.6 %	7.7 %
1997	1.2 %	-17.0 %	-14.9 %	1.0 %	15.0 %	-1.0 %	-1.8 %	-6.1 %
Average	1.3 %	0.9 %	3.2 %	6.9 %	7.1 %	8.3 %	-8.4 %	11.3 %

*Table 4.1.b Changes in money supply 1993 –1997*

	Estonia	Latvia	Lithuania	Bulgaria	Czech Rep.	Hungary	Poland	Russia
1993	61.7 %			27.9 %	-13.0 %	11.0 %	27.2 %	206.9 %
1994	18.8 %	27.1 %	34.8 %	41.4 %	40.7 %	7.7 %	33.4 %	101.0 %
1995	25.5 %	0.8 %	34.2 %	35.0 %	6.5 %	5.7 %	31.0 %	79.5 %
1996	27.0 %	17.2 %	3.5 %	78.5 %	4.6 %	18.3 %	33.5 %	25.0 %
1997	20.4 %	29.6 %	34.4 %	227.0 %	-7.6 %	20.4 %	22.2 %	22.9 %
Average	30.7 %	18.7 %	26.7 %	82.0 %	6.2 %	12.6 %	29.5 %	87.1 %

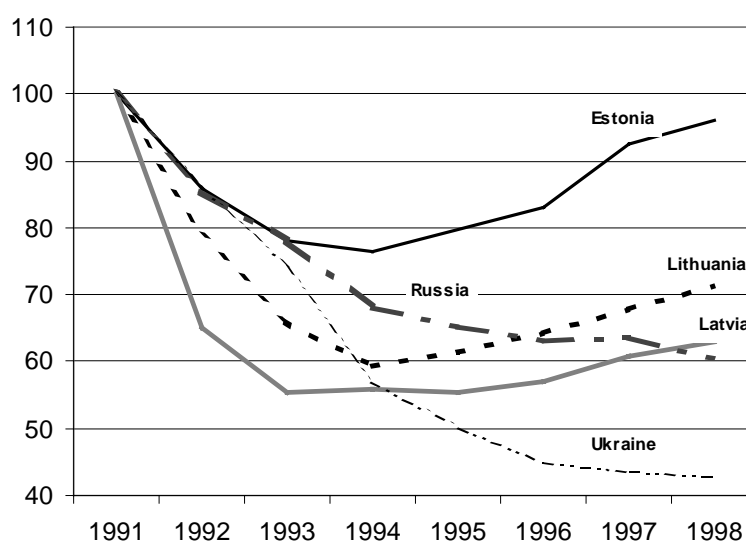
*Source: International Financial Statistics CD-ROM.*



## 4.2.2 Output

All transition economies started their transformation towards more market-based economy with a large drop in output. Some have claimed that overly tight monetary and fiscal policies were behind this drop of output, but when one considers the wide variety of policy stances in the Central and Eastern Europe (CEE) and in the former Soviet Union (FSU) it becomes evident that the output drop cannot be explained by the conventional demand-management arguments. Gomulka (1998) argues that large supply and demand side shocks caused e.g. the output fall. The old economic system produced goods that consumers were not willing to buy, and thus reallocation of resources was needed. Because this cannot be accomplished very fast, output will contract before expanding again. In addition to this the old trade ties between different companies were severed as the central planning broke down, and it took time for companies to find both new customers and suppliers.

Chart 4.3 The level of GDP in the Baltic countries, Russia and Ukraine, 1991=100



In all the countries of former Soviet Union the output contraction has been very large, in many cases over 50% of the output level at the beginning of transition. Even if one takes into account the fact that at the start of transition the statistics probably overstated the level of production and after the start of the transition they failed to take into account much of the new private sector, the drop in output is sizable. In Latvia and Lithuania the output collapse in 1992 was even larger than in Russia or Ukraine, although subsequent economic performance has been considerably better. In Estonia the initial output drop was not larger than other countries of former Soviet Union, even though the monetary and fiscal policies were obviously tighter than in most other countries. The Baltic countries were the first among FSU countries to experience GDP growth. In this sense the currency board arrangements are at least correlated with relatively good economic performance. Chart 4.3 shows the level of GDP in the Baltic countries, Russia and Ukraine from 1991 to 1998.

However, currency board (and monetary policy in general) is obviously just one part of the economic policy package. Can currency board be attributed with this early resumption in growth? Early studies concerning output decline and growth in the transition economies have usually argued that growth in the transition economies seems to have restarted only after the annual inflation rate has been pushed to low double digits. Excessive inflation rates are detrimental to growth, as they make the economic environment generally more uncertain. Insofar as currency boards have helped to reduce inflation, they have had a positive effect on the level of economic activity.

Once the initial decline in output was halted, Estonia, Lithuania and Latvia began to post respectable GDP growth figures. The Baltic growth pattern compares to the Polish experience after its initial output decline had ended, although since the Russian crisis Baltic economic growth has faltered. Estonia and Lithuania have implemented a host of economic policies conducive to growth. In both countries the structural reforms progressed quite rapidly, especially in comparison to the other FSU countries. Most reforms were in taken quite early in the transition process. Taking the EBRD's average of the transition indicators<sup>12</sup> for 1994 as a proxy for progress in transition as of mid-1994, Estonia (with Hungary, Poland and Slovak Republic) would rank near the top, right behind the Czech Republic. Lithuania is also close behind. Moreover, both countries have maintained liberal foreign trade regimes, which have fostered growth in exports and stimulated efficiency in the economy. Here one could argue that currency boards have influenced policymakers, as a

currency board requires free movement of capital. This naturally presupposes a liberal foreign trade regime, but having a currency board is not a necessary condition for having a liberal foreign trade regime. For example, Latvia introduced full current account convertibility in June 1994, only a month later than Lithuania.

The favorable development of output in Estonia and Lithuania has not been sufficient to prevent a clear increase in unemployment. This is in line with the experience in many other transition economies, where rapid reforms increase unemployment at first as companies shed excess labor. Unemployment among the Baltic countries has been the highest in Estonia, where the unemployment rate (ILO definition) rose to 10% in 1995 and has remained approximately at that level ever since. In Lithuania (and Latvia) the unemployment rate has been lower, but the economic crisis in Russia certainly increased unemployment, especially in Latvia. It is of considerable interest to what extent the existing unemployment can be considered structural; i.e. can conventional macroeconomic policies reduce the unemployment. Kuddo (1998) argues that a large portion of labor force in the Baltic countries (as well as in other transition economies) is "functionally illiterate", i.e. does not have the skills needed in a market economy. There is very little training and retraining for people in the labor force. This would imply that structural unemployment is actually quite high. On the other hand, the labor markets in the Baltic countries are very liberal. Wage setting is decentralized, so this should provide a buffer against external shocks. There is some anecdotal evidence that wages have already reacted to the recent Russian crisis in Estonia. Another possible explanation for high unemployment is the large Russian minority in Estonia (and Latvia). If this minority is discriminated against in the labor market as various reports claim, this could explain a large observed unemployment. (In Estonia, ethnic Russians make up approximately one third of the population; in Latvia, almost half.)

### 4.3 The Baltic currency boards and financial systems

One criticism against currency boards has been their inability to function as lenders of last resort in the case the banking sector experiences liquidity problems. It is at least theoretically possible that this might lead to more volatile development of the banking sector, and perhaps more banking failures than

the more conventional central bank model. However, in transition economies the number and scope of banking failures seem to be largely uncorrelated with the type of exchange rate regime chosen, and at least there is no evidence that countries with currency boards have less stable financial systems. In the early stages of transition, many banking problems were caused by an outstanding stock of bad debts inherited from the era of command economy. In addition to this, the new banks starting were often undercapitalized and did not have the experience necessary to conduct prudent banking operations. Insufficient banking regulations and supervision aggravated the problems.<sup>13</sup>

*Table 4.2 Number of banks at year-end*

	Estonia	Latvia	Lithuania
1992	43	52	27
1993	22	61	27
1994	22	55	27
1995	16	40	16
1996	15	33	12
1997	12	31	11
1998	6	28	12

*Source: Fleming et al (1996) and national central bank publications*

Table 4.2 shows the evolution of the number of banks in the three Baltic countries (including branches of foreign banks). The number of banks has decreased clearly, but most of this decline has been achieved through mergers, not involuntary closures or bank failures. However, banking crises have taken place in all the Baltic countries. There were bank closures and recapitalizations by authorities in Estonia in 1992, 1994 and finally in 1998. Lithuania experienced a banking crisis at the end of 1995. The losses to depositors have usually been minimal, except in the Latvian banking crisis of 1995, where the negative net worth of the largest bank was found to be \$320

million or approximately 7% of GDP. This bank failure was partially caused by a fraud, but also poor control of currency and interest rate risks (Fleming et al 1996). It is most probably a coincidence that the largest bank failure in the Baltic countries took place in the one Baltic country which did not have a currency board in place, but this illustrates well that at least so far many other factors have affected banking systems more than the choice of exchange rate regime.

In its strictest interpretation, a currency board prevents monetary authorities from doing anything when banks are facing difficulties. In practice, the monetary and fiscal authorities in Estonia and Lithuania have been able to intervene when individual banks are in distress. Both in Estonia and Lithuania, the central banks have held the currency reserve backing the monetary base well over 100%, which has given them valuable leeway in dealing with banking sector problems. According to Fleming et al (1996), the Estonian monetary authorities have provided short-term liquidity support (e.g. Social Bank in 1994) and taken over banks and recapitalized them (North Estonian Bank in 1994). In 1998, the Bank of Estonia made two small banks merge and became the majority shareholder in the new bank.

During the Lithuanian banking crisis in 1995, the Bank of Lithuania provided some liquidity support for a small bank (Aura Bank) that had run into difficulties. However, central bank's resources turned proved inadequate when the largest private bank (Innovation Bank) and two other banks also got into trouble. At that point, the Lithuanian parliament passed a law requiring the government to extend guarantees for interbank borrowing by troubled banks. Apparently, when the problems are large enough or systemic in nature in the banking sector of a country with a currency board system, government intervention is inevitable.

#### 4.4 Assessing the Baltic currency boards

It is obvious that the Baltic countries have been able to manage economic transition more successfully than other former Soviet Union republics. They also appear to be more successful in transition than, for example, Romania and Bulgaria. Initial conditions can explain some of the differences between economic performance, but naturally the policies chosen are also important.

In any case, the effects of initial conditions should diminish as time passes, so the effect of policies should increase.

When one examines the evidence from the different transition economies, it is clear that having a currency board does not produce (or at least has not produced so far) poorer economic performance than other exchange rate regimes. Estonia had the smallest output decline of all FSU countries, and it and Lithuania have posted very high average growth figures since the initial output collapse halted. However, one can hardly claim that currency board is a necessary condition for favorable economic development. Poland and Latvia exhibited high GDP growth after the transformational recession, although in Latvia the resumption of growth was delayed by approximately one year because of the failure of country's largest bank as well as several smaller ones. (These failures wiped out over a third of household deposits.)

As is the case with growth, it is hard to argue that having a currency board has been a necessity for reducing inflation to low double or even single digits in transition economies. Almost all countries in Central and Eastern Europe have managed to get inflation below 20%. Latvia recently posted the lowest inflation of all transition economies. On the other hand, it is hard to see how Bulgaria could have reduced inflation as successfully as it did without the added credibility of a currency board.

If currency boards have not been absolutely necessary for resumption of growth and achieving lower inflation, why have the authorities in different countries implemented them? Why would a monetary authority wish to tie its own hands? There clearly are some costs associated with losing the ability to conduct monetary policy, so what can the benefits be?

Because all Baltic countries are small and open to international trade, conventional analysis would suggest that they would benefit from having a fixed exchange rate. As currency boards are probably the most credible form of fixed exchange rates, perhaps it is not so surprising that they have been adopted in two of the three Baltic countries.

Estonia introduced its currency board and a completely new currency shortly after regaining political independence. In these circumstances, the currency board was seen as the quickest way to achieve credibility for the currency. This is indeed what happened. Capital inflows to the country started almost immediately after the introduction of the currency board, and this in a situation where the currency had no history and the new monetary authority no reputation or even experience. Despite all this, the new currency was readily accepted as a medium of exchange (see Lainela & Sutela 1994). Both

the inflow of capital and public's willingness to hold the new currency were clear signs of the credibility of the new currency.

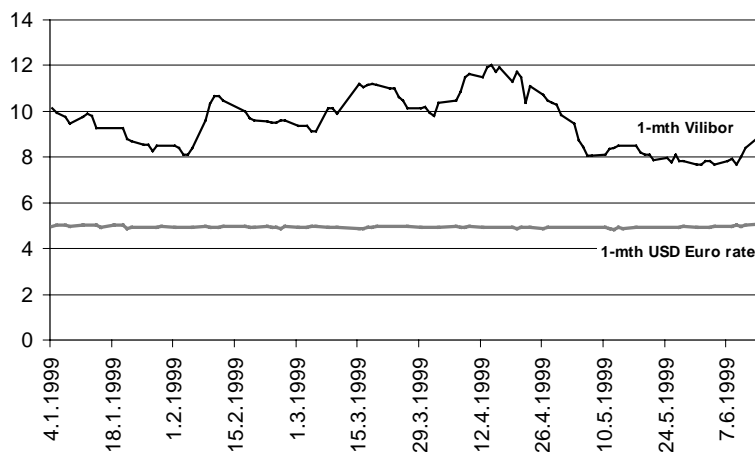
However, the introduction of currency board was only one part of a comprehensive reform package in Estonia. This package was designed to create a stable and predictable macroeconomic environment, to better enable the private sector to function and grow. Other important part of the package was fiscal policy, where the Estonian government has been more or less able to maintain balance of the central government budget, and even the deficits of the enlarged government have been very small, no more than 1.5% of GDP. This reasonably tight fiscal stance (tight, at least in comparison with most countries) has also meant that government has not suffered from the need to make the monetary authorities finance the deficit. On the other hand, it could be argued that the unavailability of such financing contributed to fiscal restraint. The third part of the package was the extremely liberal trade policy, which probably helped to improve efficiency in the economy and promote exports. As the currency board arrangement is legislatively difficult to change,<sup>14</sup> it may be seen as the cornerstone of this policy package. Still, its importance should not be overplayed.

Lithuania introduced the litas only in August 1993. Moreover, the decision to introduce currency board was not unanimous; even the central bank argued against such move (Lainela & Sutela 1994). By mid-1993, inflation had already been reduced to a reasonably low level, so this was not a case of introducing a currency board in the midst of an economic crisis. So why was the currency board adopted? Part of the reason may have been the success of Estonian currency board. It had been in operation for over 18 months and had served Estonia and its economic reforms quite well. Part of the reason may have been a genuine desire to solve the time inconsistency problem of the monetary policy. The Lithuanian public sector had a deficit of 3.3% of GDP in 1993. In 1994, the deficit grew to 5.5%. Introducing a currency board, which prevents lending to the government, removed the temptation to use the central bank to finance the deficit. Deficit financing would have eventually led to higher inflation. Having a currency board forced the public sector to finance its deficit from other, non-inflationary sources. Lithuania continued to have high deficits in 1995 and 1996 (4.5% of GDP in both years). In this sense currency board may have prevented high inflation in Lithuania. However, at least de jure, the Bank of Lithuania is as independent as the Bank of Latvia, so perhaps also the Lithuanian central bank could have attained equally good results concerning inflation without a currency board system.

Measured by indicators other than inflation, Lithuania has not fared so well. The country's competitiveness has eroded more rapidly than that of the other two Baltic countries. From 1993 to 1998, the D-Mark-based unit labor costs in manufacturing had risen by 180% in Estonia, 131% in Latvia, but 326% in Lithuania (EBRD 1999). One explanation for this difference between, say, Estonia and Lithuania can probably be found in the different speed with which the restructuring of industries and companies has progressed. This large increase in unit labor costs may also help explain Lithuania's large current account deficit.

Additional evidence on the credibility of Baltic currency boards can be gleaned from interest rate differentials. Charts 4.4a and 4.4b show the interbank rates from Estonia and Lithuania and the corresponding rates for the D-Mark and the US dollar. The Bank of Lithuania started to calculate daily interbank rates from the beginning of 1999, and this data can be used to illustrate the large gap between interest rates in Lithuania and US. For Estonia we use the monthly average for one month Talibor rate from the beginning of 1997 to mid-1999. From both charts we can see that the interest rate spreads became quite small at times, but in times of uncertainty in the global financial markets the spreads widen substantially. While this mainly reflects the inherent riskiness of Baltic banks, it also must reflect to some extent the less-than-perfect credibility of the domestic currencies.

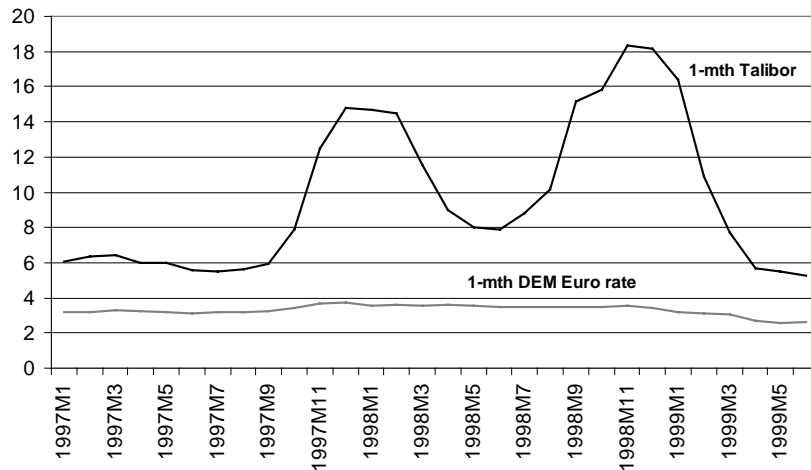
Chart 4.4a One-month Vilibor and USD Euromarket rates, %





At the moment Lithuania is in process of abandoning its currency board. The Bank of Lithuania has announced that it will give up the currency board and adopt monetary policy based on more traditional central bank model. The Bank of Lithuania has already introduced some monetary policy instruments, but the litas monetary base is still 100% backed by foreign currency reserves. Details of this gradual shift are spelled out in the Bank of Lithuania (1997), which states that Lithuania is giving up its currency board to be better able to react to problems in the financial sector. Other reasons for giving up the currency board include a desire to be able to sterilize capital inflows and generally influence economic development through monetary policy. In this regard, it is quite interesting that the Bank of Lithuania has announced that they will not give up the system of fixed exchange rate, even though they may switch to pegging to the euro or a euro-dollar basket. It remains to be seen whether Lithuania will be as successful as Latvia in maintaining a fixed exchange without a currency board. Here one should remember that for approximately the last two years, the Bank of Latvia has maintained the ratio of currency reserves to the monetary base at over 100%.

Chart 4.4b One-month Talibor and DEM Euromarket rates, %



## 5 Concluding remarks

Currency boards in the Baltic countries have been used successfully in a) gaining rapid credibility for economic policies (or at least national currencies) in a situation of severe economic turmoil and b) preventing monetary expansion (and thus inflation) in excess of the increase in the foreign currency reserves by committing the domestic policymakers to a simple monetary rule.

However, merely introducing a currency board as an exchange rate arrangement is not enough to achieve stable economic environment and growth in the medium and long term. A currency board works best as a part of a comprehensive reform package (albeit often the most credible part of the package). Currency board arrangements are typically difficult to change and this enhances its credibility as long as the other parts of the reform package are perceived to be in place.

A currency board requires reasonably tight fiscal policy. As the monetary authority cannot extend credit to the government, possible deficits must be financed from the capital markets, which means the government must be perceived as solvent. Sound public finances have been difficult to achieve in many transition economies as they often require that some interest groups in the society lose, at least in the short term. In the Baltic countries, the fiscal deficits have so far been fairly small, especially in Estonia. (See Annex.)

Currency boards also require sound financial systems. If the banking sector is weakly capitalized or poorly supervised, the capital flows associated with currency board can endanger its systemic stability. All Baltic countries have experienced banking crises, but the stability of the banking system itself has been maintained, often with the financial support of the authorities. Foreign banks presently own significant shares in the largest Baltic banks, which should increase the stability and credit-worthiness of these banks and the whole banking sectors. Both the fiscal adjustment and financial sector stability are supported by structural reforms in the economy and society at large, and in this regard the Baltic countries have been very successful. Their reform efforts (broadly understood) have been consistent, and they begun early on in the transition process. The case of Latvia also illustrates that it is possible to reach stabilization and at least somewhat stable economic growth without a currency board, provided the exchange rate and monetary policies enjoy credibility and economic policies are otherwise growth inducing.

So far none of the countries that adopted currency boards after Hong Kong have given up the arrangement. Hong Kong's currency board has been in place for nearly two decades (although not without changes), so it appears that currency boards can be sustained for a prolonged period of time. In the future both Estonia and Lithuania will presumably exit from the currency board arrangement. Both countries have stated their desire to become members of the European Union and eventually to join the monetary union, i.e. give up their own currencies. The Bank of Lithuania (1997) announced Lithuania's aim to exit the arrangement and outlined a timetable for the exit process. However, the recent uncertainty in emerging markets has apparently made the Lithuanian authorities somewhat more cautious in their approach to the exit from their currency board arrangement, so the exit has been postponed. The repegging of the litas will probably occur in the year 2000. This postponement and the large external and internal imbalances in the Lithuanian economy have prompted some commentators to question the present currency peg. Estonian authorities have chosen a different approach. Their intention is to preserve the currency board arrangement until EU membership. It is felt that the credibility of economic policies would be endangered if the currency board would be abandoned. In light of the recent experiences of Lithuania, this approach makes considerable sense.

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## Notes

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1 Some authors maintain that a system with reserve deposits and thus some room for discretionary monetary policy is not a currency board at all. See, for example, Hanke et al (1993).

2 Estonia maintained some restrictions on the capital account for the first 18 months of the currency board. Residents were not allowed to open new foreign currency deposits in the Estonian banks, see Korhonen (1996).

3 A basket approach was suggested in Lithuania (Camard 1996).

4 The present discussion on currency reforms draws heavily on Lainela & Sutela (1994).

5 Monetary overhang was the result of forced saving during the Soviet era. Households and companies couldn't increase their consumption at the same rate as their money holdings increased. Prices were fixed, so excess demand couldn't be eliminated by raising prices, i.e. open inflation. On monetary overhang in Russia, see e.g. Rautava (1993). For more detailed account of the early Russian reforms, see e.g. Sutela (1993) and Koen & Marrese (1995).

6 See Hanke et al (1993).

7 There are still restrictions on foreigners buying real estate.

8 Although Latvia has never had a currency board, we believe it is useful to examine also its economic performance. It is natural to compare Latvia and its two Baltic neighbors with currency boards, as all three countries are small, very open, and have been parts of a same country for a better part of this century.

9 These results must be regarded as preliminary, because we simply do not have many observations from countries with currency boards.

10 I use here the variable "Money" from International Monetary Fund's International Financial Statistics. This item is equal to the currency outside banks and demand deposits at the banks, i.e. it corresponds to M1. For Russia we have used the currency in circulation.

11 See Äimä (1998) for an assessment of the independence of the Baltic central banks. In the case of Estonia and Lithuania the currency board arrangement require a great deal of independence for monetary authority, but Latvia seems to be at least as independent as the other two Baltic central banks.

12 There are obviously difficulties in compressing complex economic, social and legal conditions into single numbers, but it is our opinion that these indicators give a tolerable picture of the relative ranking of different countries in their progress.

13 For an account of early experiences of bank restructuring in transition economies, see Borish et al (1995).

14 Requiring a two-thirds majority of parliament. Rupinder Singh – Juhani Laurila.



## Annex

## Macroeconomic variables in the three Baltic countries

## Estonia

	1992	1993	1994	1995	1996	1997	1998*
GDP change, %	-14.2	-8.5	-1.8	4.3	3.9	10.6	4.0
Average inflation, %	1076	89.8	48.0	29.0	23.0	11.0	6.5
Current account balance, % of GDP	n.a.	1.3	-7.1	-4.7	-9.2	-12.0	-8.6
General government balance, % of GDP	-0.8	-0.7	1.3	-1.2	-1.5	2.3	-0.3*
Nominal GDP, bn USD	1.04	1.64	2.28	3.54	4.37	4.63	5.19

Source EBRD (1999) and national statistical authorities, \* estimates by EBRD (1999)

## Latvia

	1992	1993	1994	1995	1996	1997	1998
GDP change, %	-34.9	-14.9	0.6	-0.8	3.3	8.6	3.6
Average inflation, %	951.2	108.0	35.9	25.0	17.6	8.4	4.7
Current account balance, % of GDP	1.7	6.9	-2.4	-3.6	-7.0	-6.4	-11.5
General government balance, % of GDP	-0.8	0.6	-4.1	-3.5	-1.4	1.3	0.1*
Nominal GDP, bn USD	1.5	1.69	3.65	4.43	5.13	5.64	6.40

Source EBRD (1999) and national statistical authorities, \* estimates by EBRD (1999)

## Lithuania

	1992	1993	1994	1995	1996	1997	1998
GDP change, %	-37.7	-17.1	-11.3	2.3	4.7	7.3	5.1
Average inflation, %	1020.5	410.4	72.1	39.5	24.7	8.9	5.1
Current account deficit, % of GDP	10.6	-3.3	-2.2	-10.3	-9.3	-10.3	-12.1
General government balance, % of GDP	0.5	-4.3	-5.4	-4.5	-4.0	-2.4	-6.0*
Nominal GDP, bn USD	1.91	2.66	4.71	5.94	7.89	9.59	10.69

Source EBRD (1999) and national statistical authorities, \* estimates by EBRD (1999)

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