Obituary for the Estonian kroon

By Fredrik Erixon

Fredrik Erixon is Director and co-founder of the European Centre for International Political Economy (ECIPE), a world-economy think tank in Brussels

Mimeo, December 29, 2010

Fredrik Erixon
ECIPE
Rue Belliard 4-6
B-1040 Brussels
TEL: 0032 (0)499 953 107
E-mail: fredrik.erixon@ecipe.org
WEB: www.ecipe.org

1. Introduction

On January 1, 2011, the Estonian kroon will be buried and Estonia, the small Baltic state, will become the seventeenth country to adopt the euro. Had this happened a few years ago – say, at the time of the Slovenian euro accession in 2008 – it would almost have passed unnoticed by the outside world. Today it is fairly big news.[1] Not only is Estonia's full EMU membership seen as a vote of confidence in the entire euro system – which is still fighting pressures (indeed, existential pressures if markets and the financial press are to be believed) from a suspicious market, undercapitalized banks, and government deficits and debts – it also happens shortly after Estonia has recovered from a crisis almost as cataclysmic as the economic collapse at the time of independence in the early 1990s. Could this really be the right time to join a currency union – indeed, a currency union which is fighting for its own survival?

Furthermore, Estonia's resolve to join the euro has been seen as irrational, if not stupid, by noted economists like Paul Krugman and Nouriel Roubini.[2] Estonia, they argue, should have dropped its peg to the euro and devaluated itself out of its recent crisis at an early stage. The alternative, a maintained hard peg through a currency board arrangement, with ensuing measures to radically cut fiscal expenditures and lower the real effective exchange rate, was seen as tantamount to economic suicide. Estonia, like Latvia, had repeated the Argentinean crisis in the early Noughties, and now needed to do what Argentina did: drop the currency board and devaluate.

For a moment, many people (economists as non-economists) toed the same line. The crisis was simply too big, went the argument, and could not be fought by 'depression-style' economics. Indeed, Estonia suffered a deep contraction: two years after its peak in the second quarter of 2008, Gross Domestic Product (GDP) in Estonia had been shaved off by almost 18 percent. Of all EU countries, only the other two Baltic countries suffered from yet deeper contraction. Latvia's GDP fell by more than a fourth in the same period.

Today, however, the tune is different. Estonia has recovered and recorded positive (albeit aneamic) economic growth in the past two quarters. There is still a long way to go for Estonia to return to high growth levels, but anti-crisis policy has certainly trimmed the Estonian economy and made it more competitive. And its strategic choice to defend its pegged monetary system did work.

This paper aims to convey two opinions. Firstly, the Estonian kroon and the overall monetary-policy architecture in post-independence Estonia have been remarkably successful. To support this view, the major part of this paper goes through the monetary history of Estonia since the early 1990s and sets out the specifics of the great monetary reform of 1992 as well as what it achieved.

Secondly, it is the right move for Estonia to step into the euro club. The euro is not about to collapse – at least not anytime soon. It will survive its current crisis – albeit at disastrously high cost for some of its members. Ideally, the Estonian currency board should have been replaced by a new monetary policy already a few years ago. The mission for the currency board was accomplished. And Estonia was now facing another type of problem that required a different set of policy. Euro membership will not address all potential problems. But it is an improvement.

[1] Ummelas (2010).

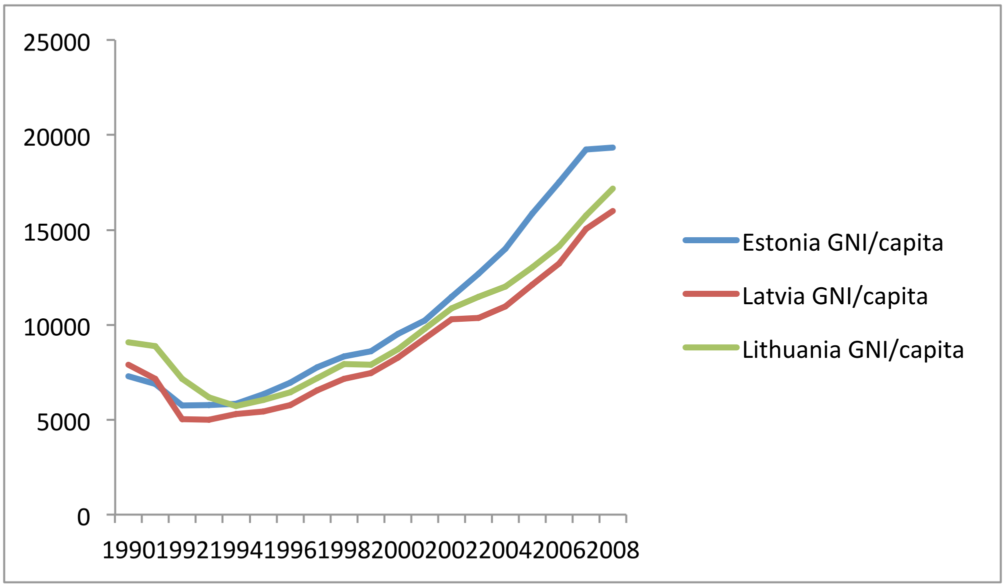
[2] Tubalkain-Trell (2009).

2. The road from Moscow: leaving the ruble zone

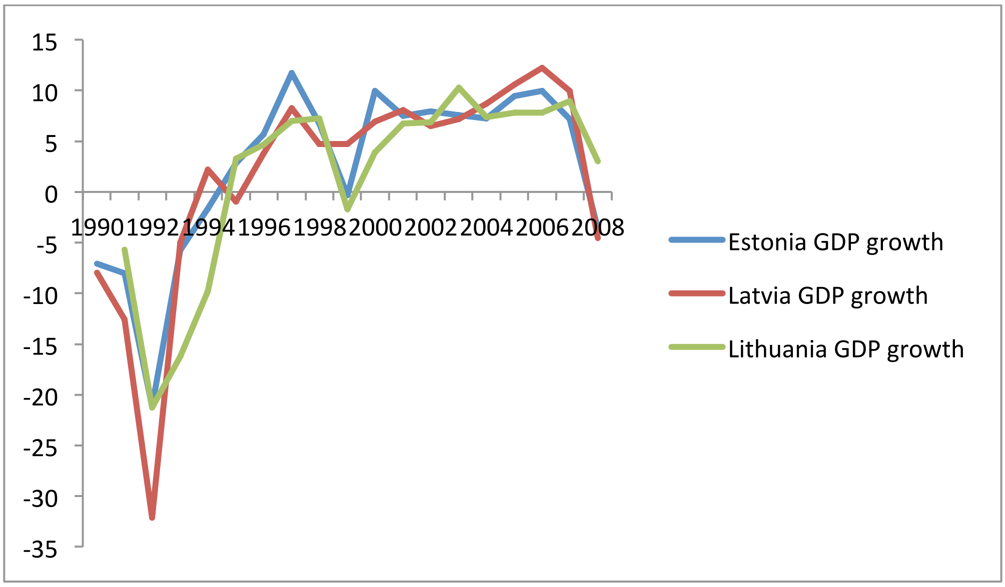
The modern history of the Estonian kroon starts in 1992. Estonia was badly hit by the severe economic downturn at the time of the breakdown of the Soviet system. The sources of crisis were several and essentially rested on the many structural flaws of the centrally planned economy. These flaws had been visible for many decades and had effectively driven Estonia to a position of chronic economic problems and financial distress. But the real transition crisis of Estonia did not start before 1991. The first signs of a mounting crisis came with the sharp fall in industrial production between 1990 and 1991. It was followed by a general decline in all sectors and subsequently a macroeconomic crisis. GDP fell rapidly and the total GDP loss in 1990-1994 was much larger in Estonia than in most other countries in the Soviet sphere.

Figure 1 shows this development graphically. GDP growth deteriorated early in the new decade and continued to be negative for five years. The low point in 1992 was marked by a negative GDP growth of 21.2 percent.[3] As a consequence, the general welfare of Estonians fell drastically in these years. In purchasing power terms, the Gross National Income (GNI) per capita fell from approximately 7500 US dollars in 1990 to less than 6000 US dollars in 1992 to 1994. The fall was even bigger in Latvia and Lithuania, and the contraction stuck for a longer time in Lithuania. The recovery was also faster in Estonia, and the country returned to real (inflation-adjusted) growth sooner than its Baltic neighbours.

Figure 1: Baltic Economic Development 1990-2009 (GNI per capita, PPP, current international USD and GDP growth per annum in %)



[3] As noted by several studies, official data over output decline probably exaggerate the actual decline as output in the early years of transition is measured at inflated prices. See for example Åslund (2001).



Source: World Bank, World Development Indicators

The macroeconomic crisis was not only a product of the sharp fall in output but also a corollary of the necessary price liberalisations in the previous years. Liberalising prices in a country suffering from chronic shortages due to distorted market-signalling functions is bound to lead to a rapid increase in official prices and inflation. Inflation was high already in the late 1980s but rose at increased pace in 1990 and 1991. The annualised inflation in 1991 was just below 40 percent. This was the beginning of Estonia's inflation cycle that subsequently led to a few months of hyperinflation (defined as a rate of inflation above 50 percent a month).

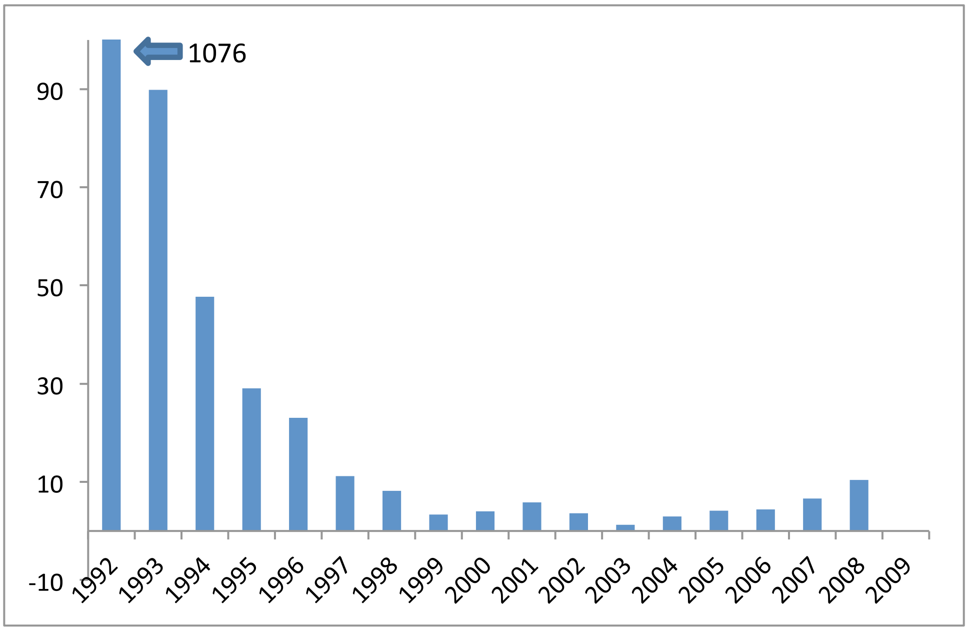
Early in 1992 inflation was pushed up additionally by price liberalisations in Russia. As shown in Figure 2, the annualised inflation peaked at 1076 percent in that year. The immediate effect of Russia's liberalisation was thus disastrous to Estonia. Prices sky-rocketed, particularly energy prices, and this 'systemic shock' led to serious disruptions in trade with Russia. As Estonia was totally dependent on Russia for its trade (almost 90 percent of Estonia's trade was with the Soviet Union) and supply of inputs to production, this led to a rapid deterioration of its terms of trade, particularly after Russia stopped subsidising and rather applied world market prices for its exports of energy and raw material to Estonia and other Baltic countries.[4] Furthermore, the budget deficit soared as the government needed to increase subsidies to groups badly hit by the high and rising inflation, partly due to price increases on key consumer goods after budget subsidies were removed.

At the beginning of the year, the government budget was set to be balanced but the government soon replaced that ambition with increasingly desperate measures to control the deficit. The general outlook in the winter and spring of 1992 was very gloomy. Political crisis and uncertainties added to the economic difficulties. The government of Edgar Savisaar resigned amid the crisis and was replaced by a government led by the former Minister of Transport and Communications, Tiit Vähi, a 'caretaker' and 'able technician' that could lead the government until the new constitution was in place and the first really free election could be held.[5]

[4] Knöbl, Sutt and Zavoico (2002), p. 9.
[5] Knöbl, Sutt and Zavoico (2002), p. 8.

But Estonia was not only importing a Russian inflation caused by its price liberalisation; the close ties to Russia provided another knock-on effect on Estonian inflation. In the whole ruble area, which Estonia was still part of, there was a considerable shortage of currency and this shortage had been causing troubles for many years. Essentially, the undersupply of currency provided a profound push effect on inflation. The stock of rubles was fixed, but the high inflation led to a much higher nominal expenditure aggregate, which was not covered with increased money supply.[6] Therefore, the 'ruble' effect on inflation enforced the already existing and growing inflation and macro-economic instability.

Figure 2: Inflation (CPI) in Estonia 1992-2005



Source: Bank of Estonia

Estonia managed to handle the crisis in 1992; indeed it was managed surprisingly well. Inflation continued to be high throughout the first five years of the 1990s, but the hyperinflation in early 1992 was mastered within months. Estonia had stabilized its economy in a few years. In the rest of the 1990s inflation was under control and from 1997 Estonian inflation was at exemplary low levels. Estonia soon also outperformed other countries in the former Soviet sphere in most macroeconomic indicators. Arguably, the programme for macroeconomic stabilisation operated much more quickly in Estonia and, in contrast to several other countries, it attacked the root causes of instability. At the centre of Estonia's successful stabilization was its new monetary system.

3. The (re)birth and success of the Estonian kroon

In June 1992, ten months after full independence in August 1991, Estonia left the ruble zone and established its own currency, the Estonian kroon (EEK). For 52 years Estonia had been part of Soviet monetary policy and it became the first country that emerged from the Soviet Union to abandon the ruble. The Bank of Estonia had been closed at the same time as the ruble became the sole legal tender in 1940 and thus the first step in establishing an own currency was to form a central bank.

[6] Kallas and Sörg (1995).

The new Bank of Estonia was established a few years earlier than the currency reform was undertaken; it was set up in January 1990 and followed the Soviet Law on Economic Independence that was promulgated in 1989 and granted some autonomy to Estonia and the other Baltic states. The new central bank did not have any formal assignments in Soviet monetary policy; the Tallinn subsidiary of the Gosbank, the Soviet state bank, was still responsible for financial intermediaries in that region. But the re-establishment was imperative to the design and the process of the subsequent currency reform; the views that emerged from the new central bank, inhabited by a group of younger market-oriented economists, contrasted sharply with old socialist thinking, and the influential governor of the central bank from September 1991, Siim Kallas, had a significant impact on the substance and sequence of the monetary reform.[7]

A currency reform that distanced Estonia from Russia was instrumental to the whole transition process, for ideological as well as economic reasons. Estonia had suffered and contracted in all possible ways under Soviet rule. Sentiments were distinctly anti-Russian and the vast majority of the population wanted a complete re-orientation of Estonia from the east to the west. A constitutional democracy and a market economy were indeed the popular choice.

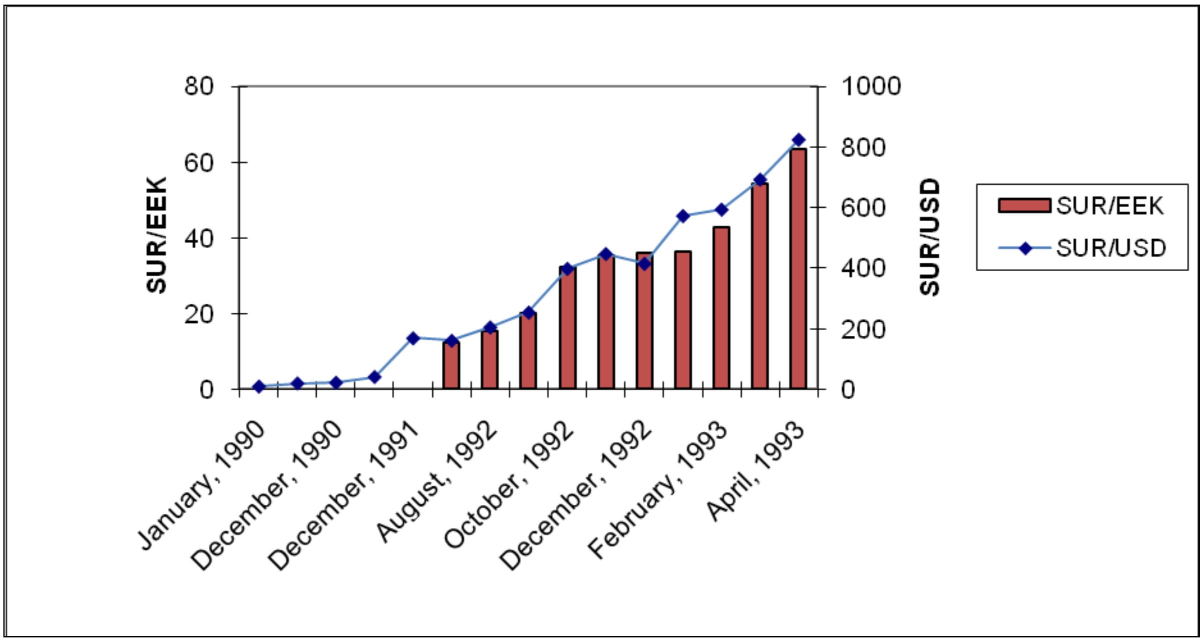
As the Russian economy contracted, a new orientation of Estonian policies became urgent. Trade relations with Russia collapsed and the Russian inflation, aggravated by the price liberalisation and the ruble shortages, spilled over to Estonia. An indicator on the need of a new currency policy can be found in Figure 3, showing the market exchange rate of the ruble to the Estonian kroon after the reform in June 1992, and the exchange rate of the ruble against the US dollar over a longer period.

Both indexes illustrate the collapse of the ruble. From January 1990, to June 1992, the ruble had depreciated considerably – from 10.27 to 144 rubles per US dollar – but a lot more was to come. Every forecast pointed to an even higher depreciation rate in the near future. The government was in desperate need of money and the Russian central bank kept fuelling money in to the fiscal budget; in the first ten months the Russian central bank lent over 820 billion rubles to the government, of which 94 percent were executed on the demand of the parliament or the government.[8] In June 1992, at the time of Estonia’s currency board reform, Russian inflation (year over year) was 1300 percent and it had grown to 2600 percent in December that year.[9]

The conversion rate in late June had been 10 rubles per Estonian kroon (see Table 2) and less than a year later the ruble had fallen by more than 600 percent.[10] Had Estonia been part of the ruble zone a year later after the actual currency reform, the economic crisis would have been calamitous. Hyperinflation would have taken a new grip on the country and output would have declined even more than it did. Therefore, another way of interpreting this figure is that Estonia was successful in restoring (or rather instituting) credibility, and ending inflation expectations, by its monetary reform and accompanying stabilisation programme. The kroon helped to stabilise Estonia’s economy while the Russian economy continued to fall.

[7] Knöbl, Sutt and Zavoico (2002); Kallas and Sörg (1994).
[8] Hanke, Jonung, and Schuler (1993), p. 47.
[9] Hanke, Jonung, and Schuler (1993), p. 48.
[10] See also Sörg (2004), p. 5.

Figure 3: Market exchange rates SUR/USD and SUR/EEK



Source: Bank of Estonia; Hanke, Jonung and Schuler (1993)

Estonia made a bold choice when it decided to centre its new monetary regime on a currency board or a monetary arrangement in many ways resembling an orthodox currency board.[11] It is common among transition countries or emerging markets to head for a monetary policy based on a pegged exchange rate. But there are several options; fixed peg, horizontal band and crawling band are the typical forms. A currency board essentially means a substantially stricter form of peg leaving very little, if any, discretion to monetary authorities to manage the peg. In its orthodox form, the currency board implies a central bank without any assignment except for issuing notes and coins and holding foreign reserves equalling a chosen indicator of money supply. The central difference between the Estonian currency board arrangement and a traditional form of peg is thus the discretion for monetary or political authorities to adjust the peg – the exchange rate to which the local currency is pegged to another currency or a basket of currencies. This is important for a country that strives to end inflation expectations and restore (or build) credibility for its monetary policy. In a traditional peg there is much greater room for adjustments and thus also for diluting the strictness of the monetary order.

[11] Currency board *aficionados* would prefer to not call the Estonian monetary system a currency board, but a central bank system mimicking certain features of a currency board, in particular the foreign-reserve backing of issuant currency by 100 percent or more (see Hanke, Jonung, and Schuler (1993); Sachs and Lipton (1992)). In other respects, the Estonian monetary system deviates from the orthodox currency board; it is a pegged and not a fixed monetary regime and it provides for the Bank of Estonia to act as a lender of last resort in terms of financial crisis. In this paper, the Estonian case is called a currency board or a currency-board arrangement (CBA). Aficionados are correct in their analysis, but it is arguably the case that most features in the Estonian monetary system are in tune with an orthodox CBA.

Table 1: A typical currency board versus a typical central bank

Typical currency board	Typical central bank
Usually supply notes and coins only	Supplies notes, coins and deposits
Fixed exchange rate with reserve currency	Pegged or floating exchange rate
Foreign reserves of 100 percent	Variable foreign reserves
Full convertibility	Limited convertibility
Rule-bound monetary policy	Discretionary monetary policy
Not a lender of last resort	Lender of last resort
Does not regulate commercial banks	Often regulates commercial banks
Transparent	Opaque
Protected from political pressure	Politicised
High credibility	Low credibility
Earns seigniorage only from interest	Earns seigniorage from interest and inflation
Cannot create inflation	Can create inflation
Cannot finance spending by domestic government	Can finance spending by domestic government
Requires no 'preconditions' for monetary reform	Requires 'preconditions' for monetary reform
Rapid monetary reform	Slow monetary reform
Small staff	Large staff

Note: The characteristics listed are those of a typical currency board or central bank, especially one in a developing country, not those of a theoretically ideal or exceptionally good currency board or central bank.

Source: Hanke, Jonung, and Schuler (1993), p. 6

In a currency board arrangement (CBA), as can be seen in Table 1, the peg is fixed and supported by foreign reserves. Extending the circulation of notes and coins must thus be accompanied by an increase of foreign reserves, normally the reserve currency that is the anchor of the domestic currency. All other activities usually performed by a central bank are in a CBA left to the market. In other words it is a very transparent and market-conducive monetary order.

As a consequence, the balance sheet of a central bank that performs as an orthodox CBA should not, ideally, contain more than data on foreign reserves and liabilities in the form of money supply and deposits of commercial banks. Admittedly, many currency boards, present as well as historical, are not designed in this orthodox form and largely extend some discretion to monetary authorities; credit monitoring and 'lender of last resort' arrangements for securing financial stability are common forms of interventions.

The key feature of a currency board is that it has a foreign reserve backing of 100 percent or more of the monetary base. In normal speak that means all currency in circulation is backed by a foreign reserve held by the currency board authority. Following this, a central bank does not have an active role at all in determining the monetary base – and thus cannot create inflation at its own discretion. If the monetary base should expand, so must also the foreign reserves. In this respect, money supply is endogenous, created by market activities of economic actors.[12]

This constraint on monetary authorities, indeed on fiscal authorities too, can be accused of inducing problems of inflexibility in economic policy. That is of course true and one of the chief motives for instituting a currency board, but it is essentially not as inflexible as many of its critics argue if the system is allowed to work in textbook fashion. The problem, of course, is that policy never evolves in textbook fashion, and it is clear that Estonia's monetary regime – although changed, and quite fundamentally so, since 1999 – was one of the factors behind the crisis in 2008/9. However, the flexibility in a currency board works through the foreign reserves. Since the monetary regime is based on foreign reserves it is also elastic to changes in demand. Primarily this flexibility operates through changes in the current account balance (a current account surplus increases money supply). But that is not the only channel of flexibility in a currency board arrangement. Endogenous money supply largely implies that commercial banks operate as automatic stabilisers. Excess liquidity is sterilised by commercial banks acquiring additional foreign assets and, if the demand for money is different, they sell foreign assets for domestic assets. Put differently, money supply can increase despite the *status quo* in the current account balance. The problem, though, is that this flexibility is only partial, and does not really address the type of problems Estonia was facing after it joined the EU: soaring current account deficits but high inflow of foreign capital.

Table 2: The logistics of Estonia's currency reform

Date:	The Estonian kroon became the legal tender at 4:00 a.m. on June 20, 1992. Individuals could convert rubles into kroon at special cash exchange offices at the official conversion rate during the period June 20-22, 1992, during the hours 9 a.m.-10 p.m.
Official conversion rate:	10 rubles = 1 Estonian kroon
Conversion of cash rubles	All resident individuals (including children) and non-residents with resident permits could convert ruble notes equivalent to a maximum of rubles 1 500 at specific bureaus based on place of residence (which was equivalent to about US$ 13 at the prevailing exchange rate). Cash exceeding rubles 1 500 could be exchanged at the (punitive) exchange rate of 50 rubles = 1 Estonian

[12] Sepp and Randveer (2002).

	kroon. Enterprises had until June 20, 1992, to deposit cash rubles into their bank accounts which were then converted as noted below.
Conversion of account rubles at commercial banks	All ruble current accounts, time deposits, and savings accounts were re-denominated into Estonian kroon at the official conversion rate. However, balances in savings accounts in excess of rubles 50 000 deposited since May 1, 1992, and transactions from other ruble states in excess of ruble 1 million and made after May 1, 1992, were blocked until their origin was verified and a decision was made on a case-by-case basis. Commercial banks were closed during the period June 20-25, 1992, to allow for the re-denomination of ruble accounts. The Bank of Estonia guaranteed access to cash by commercial banks up to the amount of their correspondent accounts with itself.
Total cash rubles collected:	Rubles 2.3 billion (or about 3 percent of GDP).

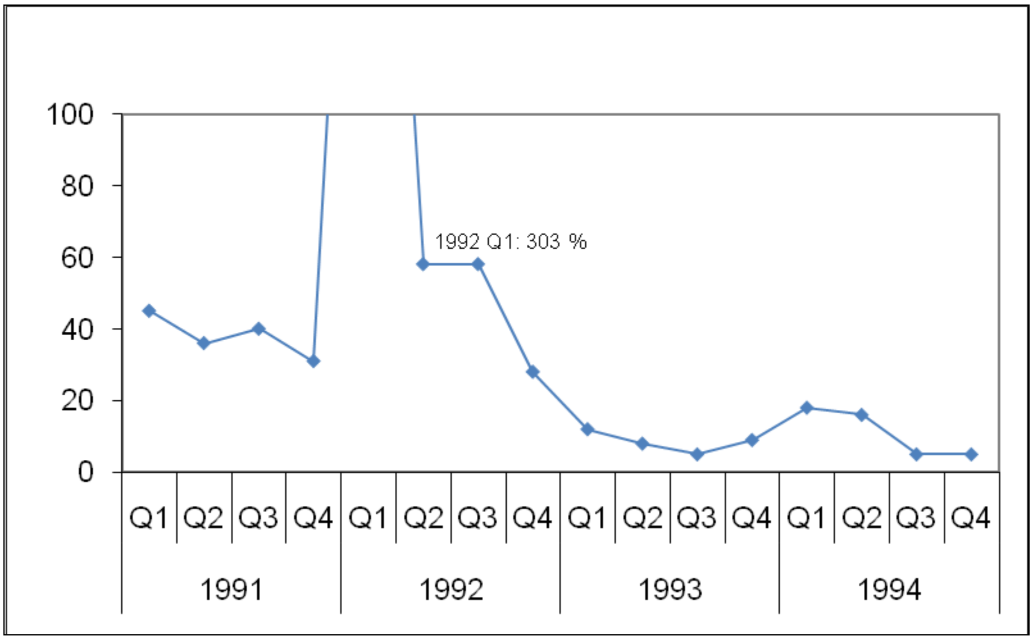
Source: Knöbl, Sutt and Zavoico (2002).

The quest for macroeconomic stability

Estonia opted for a currency board arrangement for several reasons. We shall here discuss three of the chief reasons: ending inflation expectations (macroeconomic stability), the political economy of a currency board *vis-à-vis* other monetary regimes, and FDI attractiveness.

Estonia needed a new monetary regime to cut off the air supply to inflation pressures and generally build confidence for the economy – in other words: terminating inflation expectations. This was the chief reason behind the currency reform and why it needed to be achieved urgently. Inflation had peaked in the first quarter of 1992 (see Figure 4). Early that year there were good reasons to believe that inflation would decline from this quarterly rate of 300 percent, mainly because the January peak reflected the Russian price liberalisation shock, but still the inflation prognoses suggested inflation in the second and third quarter to be in the band of 50-100 percent.

Figure 4: Estonian inflation 1991-1994 (CPI, quarter-on-quarter)



Source: IMF European 2 Department's database

The key element in circumventing the inflation pressures was to abandon the ruble zone. Naturally, other measures needed to be taken too, but unless Estonia could stop importing inflation from Russia and establish a monetary policy in tune with Estonian fundamentals and conditions, every effort to stabilise the economy by other means would fall short.

This does not explain why Estonia established a currency board arrangement. There were other options. Latvia, for example, did not follow the example of Estonia and established in July 1992, a new floating regime that in 1994 was pegged to the Special Drawing Right (SDR), the currency unit of the International Monetary Fund. Lithuania left the ruble zone a bit later than the other two Baltic countries and started the new regime with a flexible exchange rate policy. A few years later Lithuania also pegged its currency (to the US dollar). In terms of abating inflation, all three countries were successful and had it under control within a few years. In both Latvia and Lithuania, the pegging of their currencies did leave substantial imprints on stabilising inflation.

Thus, overview studies of monetary policy in transition countries finds pegged regimes to be more efficient in stabilising inflation than flexible regimes. A study by economists at the IMF also find evidence for pegged regimes generally being better at controlling inflation than policies built on floating exchange rates.[13] In their sample of countries, the average inflation was 8 percent in pegged exchange rate regimes and 16 percent for floating exchange rate regimes. Later research also finds support for CBAs having a relatively slower growth in the velocity of money and thus a slower growth of inflation than an orthodox pegged regime.[14] Such studies should arguably be treated cautiously as there are different forms of pegged systems that operate in different ways and also lead to different results, but arguably the strict form of peg embodied in a currency board is very effective in ending inflation expectations, if it is properly designed.

[13] Ghosh, Gulde, Ostry and Wolf (1996).

[14] Ghosh, Gulde and Wolf (1998).

Yet price stability is not the only indicator of the success, or failure, of a monetary regime. Other ambitions matter too and many economists generally side with regimes allowing greater flexibility. In principle, a floating exchange rate regime is what the International Monetary Fund advised at the time although it supported other regimes.[15] This is part of the never-ending story of the Scylla of discipline and the Charybdis of flexibility.

Ideally, a monetary regime would discipline monetary and fiscal authorities while it simultaneously allowed for flexibility in matching supply and demand. Pegged regimes can have, and often do have, some adverse effects on economic growth. Some analysts also claim that the exact specifics of monetary regimes do not matter much for stabilisation; monetary discipline and a general stabilisation programme attacking factors of instability are what matter.[16]

General programmes of stabilisation are naturally of great importance, but one should not neglect the design of monetary policy when reviewing the overall efficiency of transition policies. Money matters and it affects economic performance in many ways. The key concern is to end inflation expectations and to restore (or build) confidence – generally to get actors to behave differently and assess the future in ways other than they are used to. At a time of general chaos many circumstances speak for adopting a nominal anchor to hinge the process upon – in particular when politicians and authorities have no real experiences of managing a market-based order. This was the situation in Estonia and the overall reason for why a floating regime was viewed to be less effective in restoring confidence.

It is difficult to tell what tipped the balance in favour of a currency board in Estonia or where it got the inspiration to head for such a monetary solution. Obviously, the recent history of a currency board in Argentina mattered.[17] In the winter and spring of 1992, the new monetary regime in Argentina, only one year old, was seen, quite rightly, as a success in restoring stability. It is also true that Estonia probably would not have opted for a CBA if Siim Kallas had not been the overall master for managing the process to a new monetary order. In addition, some economists exercised a significant influence on Estonian authorities and on Siim Kallas, in particular Jeffrey Sachs, and his former student Ardo Hansson, who was advising Estonia on transitions policies.

When Kallas assumed the position of Governor of the Bank of Estonia in September 1991 he was already focused on a currency reform. Such a reform had been part of the IEM proposal four years earlier, but this proposal did not suggest an exact design of Estonia's new monetary order. Nor did Kallas have a clear idea of the particulars of a currency reform when he took office. He had been fascinated by the gold-standard period in Estonia 1927-1933 and toyed with the idea of a gold-based exchange rate system for Estonia, but this idea was never materialised into thorough studies of its feasibility, practicality and effect on the Estonian economy.

[15] Lavigne (1999), p. 143. The IMF also supported the Estonian currency board and gave technical assistance to Estonian authorities when it was constructed as well as financial support to the stabilisations programme accompanying the currency board.

[16] Budina and van Wijnbergen (1997).

[17] The same reason for not calling the Estonian monetary regime a currency board applies equally to Argentina. Furthermore, Estonia has since 1992 acted as a currency board, except for bailing out a bank, while Argentina and its central bank deviated considerably from the behaviour of a typical currency board.

In the last months of 1991, discussions became more intense and it was decided by the Bank of Estonia and the Monetary Reform Committee (MRC) that Estonia should move directly to an independent currency and not, as had been suggested, start with a transition phase of vouchers or parallel currencies before full reform took effect. In the first quarter of 1992, as inflation skyrocketed and output plummeted, the reform discussion intensified and the search for a new monetary arrangement became more or less desperate. The situation was acute; indeed, the government of the City of Tartu actually established an own currency to mitigate the effects of ruble shortages, but this move was naturally suppressed by the Bank of Estonia.

This was the climate to which Jeffrey Sachs arrived when he visited Tallinn in the spring of 1992 to meet with Governor Kallas and government officials. Sachs had earlier not endorsed a currency board solution for Estonia; one of his first ideas what that Estonia should stay in the ruble-based order. But when in Tallinn, Sachs suggested to Kallas that Estonia should introduce a currency board and he outlined the details of the proposal in a memorandum.

In order to build confidence in Estonia's new currency policy, Sachs went as far as suggesting a currency board arrangement based on full coverage of the entire stock of broad money.[18] Sachs had positive experiences from Poland's new monetary regime from January 1990 when it pegged the zloty to the US dollar as part of the general 'big bang' programme.[19] In the first month of the new decade, Poland experienced hyperinflation (77.3 percent in January) and in the last five months of 1989 the average monthly inflation had been nearly 34 percent.[20] Stabilisation came soon after the new programme had set in. In February inflation dropped to 15.8 percent and in the subsequent months that year inflation was single digit.

This was the backdrop to Sachs 'proposal and Governor Kallas took an immediate liking to the idea of a currency board; in some respects it resembled the gold standard regime, particularly its political economy effects (disciplining policy by limiting discretion). Soon thereafter it was decided that Estonia should establish a currency board. At that time the IMF (which was involved in the discussions), particularly due to negotiations over Estonia's entry to the IMF and a subsequent stand-by agreement, was moving in the direction of supporting a currency board.[21]

The currency board legislation was drafted in May and in June the new monetary regime was introduced (see table 1 for specifics of the introduction). The technical aspects were important and Estonia faced some tough decisions.

First, what should be the anchor that the Estonian kroon is pegged to?

Second, at what exchange rate should the kroon be pegged?

Third, what should the currency board cover?

[18] Broad money is a wide measure on money supply that not only contains currency in circulation (M1) but also savings and small time deposits, overnight repos, and non-institutional money market account (M2).

[19] Poland floated the zloty in October 1991 but then the economy had stabilised and inflation was low.

[20] Sachs (1993), p. 72.

[21] The International Monetary Fund had originally favoured a traditional central bank model for Estonia. See Lainela and Sutela (1994), p. 36. Knöbl, Sutt, and Zavoico (2002) also discuss the relations between Estonia and the IMF.

Fourth, where could Estonia find capital and currency for the reserve?

Fifth, should the Bank of Estonia be assigned to carry out any other mission than issuance of currency and holding foreign reserves?

The Bank of Estonia and the MRC moved swiftly in May and decided to have the Deutsche mark as the anchor currency. Several reasons were behind the preference for the mark. The German Bundesbank had a long reputation of price stability and its credibility thus could spill over to Estonia. In the forthcoming years, it was assumed that foreign trade with Europe would grow rapidly so a European currency would be beneficial. The idea of future membership in the European Union also favoured a European currency. Pegging the kroon to the European Currency Unit (ECU) was discussed but considered to be negative for transparency;[22] Estonia needed a monetary regime that people would have confidence in after the period of a dwindling ruble, and an anchor currency with tangible notes and coins was in that respect important.

When the currency board was introduced, the pegged rate between the kroon and the mark was eight to one (8:1).[23] Eight Estonian kroons would get one mark.[24] This was a deliberately low ratio and it followed the currency reforms in other countries such as Poland in 1990 and (as it then was called) Czechoslovakia in 1991. As CMEA had collapsed and Russia was on the brink of substantial contraction, trade with other European countries needed to increase and devaluation would stimulate export. In hindsight, this deliberate undervaluation may have been ill-judged. It affected stabilisation and slowed down the initial decline in inflation. It could be argued that the era of double-digit inflation was prolonged by this undervaluation and its effect on wage and price increases.

Indeed, in a fixed regime there is no other way an appreciation can occur than through higher inflation. There were also reasons for expecting an appreciation. In transitions from a centrally planned economy to a market economy there will be substantial differences in productivity growth between sectors. The differences between traded and non-traded goods often lead (if the transition is successful) to an appreciation of the real exchange rate as the traded sectors become more efficient than sectors still operating in a closed economy or lagging behind in terms of integration in the world economy.

This so-called Balassa-Samuelson effect also occurred in Estonia.[25] The real effective exchange rate appreciated considerably in 1992. It depreciated in the first two quarters of 1993 but subsequently appreciated again in the last quarter of 1993 and in all quarters of 1994. Another way of describing the different development in the traded and non-trade sectors can be found in Table 3.

Inflation in the sheltered sector slows down considerably after the peak in 1992, but not as fast as inflation in the open sector. Furthermore, inflation continues to be substantially higher in the sheltered sector. There is also a clear difference between the development of producer prices and

[22] Ross and Lättemäe (2004), p. 147.

[23] The Estonian currency board is not fixed but a pegged system. The Bank of Estonia cannot change the exchange rate but the Estonian parliament can. Sachs and Lipton (1992); Hanke, Jonung, and Schuler (1993).

[24] In 1999, when Germany joined the EMU and introduced the euro, the Estonian kroon was re-pegged to the euro.

[25] This effect is named after economists Bela Balassa and Paul Samuelson.

export prices, suggesting that the export prices reflects a better performing sector than the producer price index taking all production into account.

Table 3: Inflation in open sector and sheltered sector 1992-1995

	1992	1993	1994	1995
Inflation (CPI)	1076.5	89.8	47.7	29.0
Open sector	991.6	84.9	33.9	17.5
Sheltered sector	1702.7	149.3	89.2	52.1
Producer price index*	…	…	32.8	21.8
Export price index*	…	…	22.2	17.2

* December-on-December

Source: Sörg (2004), p. 3; International Monetary Fund (1999), p. 99

Estonia neglected one aspect of Jeffrey Sachs's proposal for a currency board: instead of a wide measure for foreign reserves coverage (broad money), Estonia determined not to include liabilities of commercial banks in its foreign reserves coverage, which narrowed the extent of foreign exchange needed to be held by the Bank of Estonia.

This was for two reasons. First, if liabilities of commercial banks had been included, this would have constrained the operation of banks considerably. Secondly, Estonia did not have much foreign currency to use when building up the foreign currency reserve.[26] Therefore the currency board had to be launched without full reserve backing; approximately 90 percent of the liabilities of Bank of Estonia were backed in the first month of the new monetary arrangement. But within a few months the reserve ratio became positive.[27]

The sustainability of the Estonian currency board reform is definitely due to its impact on stabilisation. It was the centre of gravity in the post-independence macroeconomic crisis and it managed to not only stay alive but, more importantly, cushion the effects on the Estonian economy of the Russian and Asian crisis that hit emerging markets severely. Estonia was affected too; output and foreign inflow of capital fell, the fiscal deficit soared, interest rates increased and a bank went bankrupt. Still, the currency board restrained policy and facilitated the flexibility needed in money

[26] The reserve was built up by government-owned forest, gold held by the Bank of Estonia before 1940 when the Soviet Union annexed Estonia, and foreign notes that Estonians exchanged for kroons. Not all gold had been restituted at the time when the currency board arrangement was launched, but in July additional reserves arrived from Sweden and the Bank of International Settlements.

[27] Knöbl, Sutt and Zavoico (2002), p. 11, show the reserve development immediately after the reform.

supply at the time. One central policy consequence of these crises was an enforced belief in the currency board.[28]

The political economy of Estonia's currency board

The Estonian currency board meant, figuratively, putting a straight-jacket on fiscal and monetary authorities. In a currency board, base money can only be created by increasing the stock of foreign currency and thus it was not possible for the Bank of Estonia to finance government deficits or to support business by monetary manipulations. In other words, the discretionary power of monetary authorities had been strictly limited in this arrangement.

This was not an unintended consequence or a side-effect of Estonia's currency board; it was arguably one of the chief reasons why Estonia established a currency board rather than just pegging the new currency in a traditional monetary order based on the central bank as the navigator and regulator of the macro economy. Admittedly, the peg implies possibilities for alterations of the exchange rate, but in contrast to a normal central bank peg, Estonia had a strong foreign reserve.

It is not difficult to understand the rationale behind limiting discretionary powers. In the years before the currency board was introduced, the Estonian economy was contracting and sober observers did not believe in radically better conditions in the years to come. There had to be a complete restoration of the economy. Central planning had to be eradicated and replaced by a market economy. Prices had to be liberalised. Production had to be adjusted to market conditions. Privatisation of many state-owned firms was badly needed. The financial sector faced radical transformation which would probably result in bankruptcies. Economic policy in general had to be rebuilt.

Furthermore, there were many political uncertainties at the time. The Savisaar government had resigned early in 1992 and been replaced by the Vähi government. They did not differ much; Vähi had been a minister also in the preceding government. More importantly, the Vähi government was only a temporary solution till the first genuinely free election was held later in 1992. It was difficult to tell what the result of the election would be and if a new government would have the capacity to deliver reforms and even to gear up the reform pace considerably after years of slowly moving policy changes. Uncertainties such as these pointed to a monetary order that provided strict conditions for monetary as well as fiscal policies. Indeed, in order to gain confidence from citizens as well as the outside world, Estonia had to hedge reform efforts as much as possible from wishes, demands, prejudices or pressures of the interventionist ilk.

There was another uncertainty that suggested a regime that is easy to manage: the accumulated stock of central bank knowledge in Estonia was limited. Simply put, there were not many Estonian experts on central banking around. Furthermore, the apparatus for collecting data on the economy was not prepared for delivering the sort of detailed information an orthodox central bank need to operate sufficiently well. These insufficiencies enforced the view that Estonia did not have in place the preconditions for running an advanced central bank.

[28] Sepp and Randveer (2002), p. 21, discuss the effects on Estonia from the emerging market crises in the 1990s, particularly the Russian and Asian crises.

As every historian of monetary policy knows it is always tempting for political bodies to use this policy for various objectives. Many of the people involved in the discussion over currency reform also nurtured suspicions that discretion would undermine stabilisation. These suspicions were enforced in the months preceding the currency reform.

A sizeable division between the government and the Bank of Estonia over central bank operations occurred in May 1992 as the former favoured interventionist policies aimed at accommodating fiscal deficits. Moreover, the government proposed, as late as a month before the currency board reform, that it preferred the new currency to circulate immediately and in parallel to the ruble before the real reform was achieved. The hidden meaning of this proposal was deficit financing as the *ex ante* value of the kroon would be significantly higher than its *ex post* value after the full reform. Essentially the government wanted the Bank of Estonia to finance its deficits and provide credit to businesses that had or soon would run into financial difficulties.[29] Governor Kallas and the Bank of Estonia opposed this proposal and it was also turned down in the MRC. But Vähi continued to fight for his proposal and took it to parliament, which also rejected it.

This reflected an overall difference in economic and ideological outlook. The Bank of Estonia was headed by one of the leading proponents of market economy reforms, Siim Kallas, and had for some time only hired staff that basically shared that view.[30] The government, on the other hand, harboured Ministers as well as officials taking a more traditional socialist outlook on Estonia's future. Tiit Vähi and several others in the government were reformists, but they had several doubts about the extent of the reforms and largely favoured an idea of a third way between capitalism and socialism.[31]

Doubts over the use of discretionary power suggested to many involved in the discussion at the time that a currency reform needed to tie Estonia's politicians to a strict reform policy. In other words, the alluring voices of the Sirens would be too tempting to neglect. As political concerns would mount as banks would run into trouble, and possibly also after a turbulent election, it became even more important to constrain discretionary bodies.

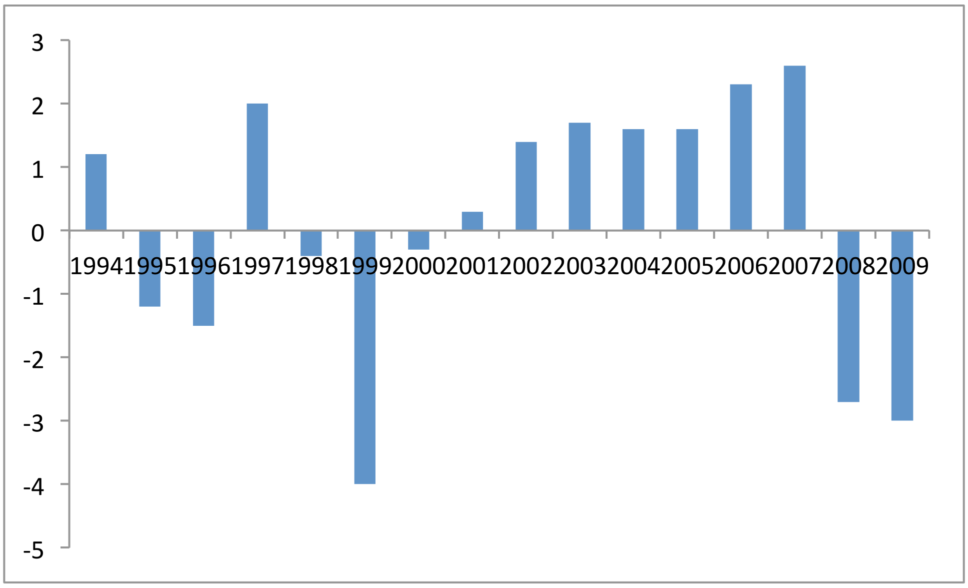
The link between monetary order and fiscal policy was always present in the reform discussions. The fiscal deficit soared in the winter and spring of 1992. Most observers believed the deficit would continue to be high, perhaps even rising, unless Estonia would undertake a comprehensive stabilisation programme centred upon a new monetary regime. An objective of the currency reform was therefore to limit the possibility for government to finance deficits. Admittedly, a government can lend money on the private market if there are people believing in its creditability, but the key aspect of the reform was to disintegrate fiscal deficits and central bank credit.

[29] Laar (2002), p. 120.

[30] Knöbl, Sutt and Zavoico (1994), p. 5.

[31] Kallas and Sörg (1995); Laar (2002).

Figure 5: General government balance 1994-2009



Source: EBRD (2006); EBRD (2010)

This constraint on deficit financing has had a significant effect on Estonia's public finances. It has not eradicated budget deficits, which would not be beneficial let alone possible, but the currency board has clearly led to an overall control of the fiscal budget. As shown in Figure 5, fiscal deficits have been small, except in 1999 around the time of the Russian financial crisis that led to a recession and falling tax revenues in Estonia (and several other countries). The deficit expanded again with the recent crisis, peaking at no more than 3 percent of GDP. In several years the government has also run a surplus enabling the government to repay debts.

Estonia is unique among transition countries to have had such control over public finances. And Estonia continues to excel in this field. Of the eight countries formerly in the Soviet sphere joining the European Union in 2004, Estonia was the only country having a budget surplus that year. Four countries did not pass the Maastricht criteria of a budget deficit less than three percent of the GDP. Estonia continues to have one of the most stable public finances, despite the crisis. When it joins the euro, it will actually be one of few members that actually honour the Maastricht criteria on deficits.

This can also be seen in comparisons over government debt. Total public debt in 2004, a year of importance as it was the crowning of the reform period by accession to the EU – equalled only four percent of GDP (see Table 4). This can be compared to the other Baltic countries having a public debt of 15 and 23.3 percent of the GDP. And the Baltic countries have performed well in view of public debt in other Central and East European Countries. In 2004, Hungary would not have passed the Maastricht limit on public debt (which is also true for some countries already in the European Monetary Union). Poland and Slovakia have public debts well above 40 percent of GDP and the average for EU-8, the eight countries formerly in the Soviet sphere joining the EU in May 2004, is 31.1 percent.

Table 4: Fiscal deficits, public debt, inflation and interest rates in EU-8 at the time of accession

	Fiscal deficit*	Public debt*	Inflation (%)	Interest rate (%)
EU-8 Countries	-2.8	31.1	4.3	5.4
Czech Republic	-3.5	24.1	2.8	4.8
Estonia	1.7	4.9	3.0	4.4
Hungary	-5.4	60.8	6.8	8.2
Latvia	-1.1	15.0	6.2	4.9
Lithuania	-2.2	23.3	1.2	4.5
Poland	-6.5	49.5	3.5	6.9
Slovak Republic	-3.3	43.6	7.5	5.0
Slovenia	-1.9	27.8	3.6	4.7

* In percent of GDP

Source: IMF (2005)

Except for a strict policy for fiscal deficits, Estonia has established a Stabilisation Reserve Fund where part of the savings from budget surpluses and revenues from privatisation have been placed.[32] This fund was established in 1997 and invests its capital abroad. This is rather exceptional. Other countries that have started funds like these have usually been countries such as Norway, Botswana and Kuwait that have vast current account surpluses due to their vast resources of commodities and need to sterilise its excess surpluses in ways not lowering their competitiveness. Hong Kong, Singapore, Chile and New Zealand have also established such funds and with Estonia they share the policy of profound unilateral internal, external and monetary liberalisation.

The Estonian Stabilisation Reserve Fund was established for four reasons. First of all, with its experience of a severe macroeconomic crisis Estonia wanted to establish institutions that can help cushion macroeconomic crises without jeopardising fiscal and monetary conservatism. Secondly, Estonia needed to reform its pensions system and build reserves that cannot be appropriated by politicians for spending on other means. Thirdly, at the time of reform Estonia had a period of rapid credit growth and needed to cool liquidity; this was achieved by transferring public savings abroad. Fourthly, the large revenues from privatisation needed to be sterilised without expanding liquidity.

Attracting foreign direct investments

The third and last major reason behind Estonia's move to a currency board was its simplicity, transparency and thereby its attractiveness to foreign investors considering investments in Estonia.

[32] International Monetary Fund (1999), p. 37.

As has been discussed earlier, Estonia needed to reorient itself from the east to the west amid the contraction of Russia's economy and the collapse of the CMEA. Trade and investment flows declined considerably in the prevailing chaos at the time. Furthermore, the lack of domestic capital and knowledge increased the demand for foreign direct investments (FDI) in Estonia.

The currency board had several characteristics of relevance to a new outward-looking FDI regime in Estonia. First of all, the currency board rests on full convertibility between currencies and cannot really function under conditions of limitations to convertibility. That is in opposition to the whole idea with a currency board; furthermore, it is overall pointless to restrict convertibility if the central bank is bound by law to cover all domestic currency in circulation by reserves in another currency that operates under full convertibility.

Full convertibility can be achieved under other monetary orders too, and indeed was so in all European transition countries regardless their choice of monetary regime.[33] Yet a currency board is to be favoured from this point of view; the currency board limits discretionary power to partly repeal convertibility if such a move would be preferred by political or monetary authorities.

Secondly, and following from the first proposition, the limitation of discretionary power implies less possibilities to manipulate exchange rates and engage in business concerns via central bank intermediaries. This was a central concern in the early 1990s. If Estonia was to attract foreign investors, it needed to institute a monetary order that investors could have confidence in. Of particular importance was price and exchange rate stability, lowering the need for investors to hedge investments for adverse changes in the exchange rate.

Thirdly, the currency board is essentially a signal of outward orientation and is in most cases accompanied by current account liberalisation and substantial, if not full, capital account liberalisation. Indeed, an open trading order is of necessity to the currency board since money supply hinges upon changes in external balances. In this respect, external liberalisation is a locus of changes in domestic monetary demand.

Estonia did not fully liberalise capital account transactions immediately, but did so soon after the currency board reform. The result has been beneficial to Estonia. It has attracted vast amounts of foreign direct investments and has one of the largest stock of FDI per capita in comparison with other transition countries. For a small country with little or no domestic capital resources, which was the case at the time of independence, openness to foreign capital was central to economic growth, structural change, and the build-up of a financial system. Yet openness to foreign capital has been in the firing line in the current crisis: is it not foreign capital that has destabilised Estonia – and other Baltic countries – by fuelling credit and demand? This view has added to a sentiment that has been ideologically sceptic to the "selling out" of Estonian assets. So was foreign capital the culprit or an accomplice?

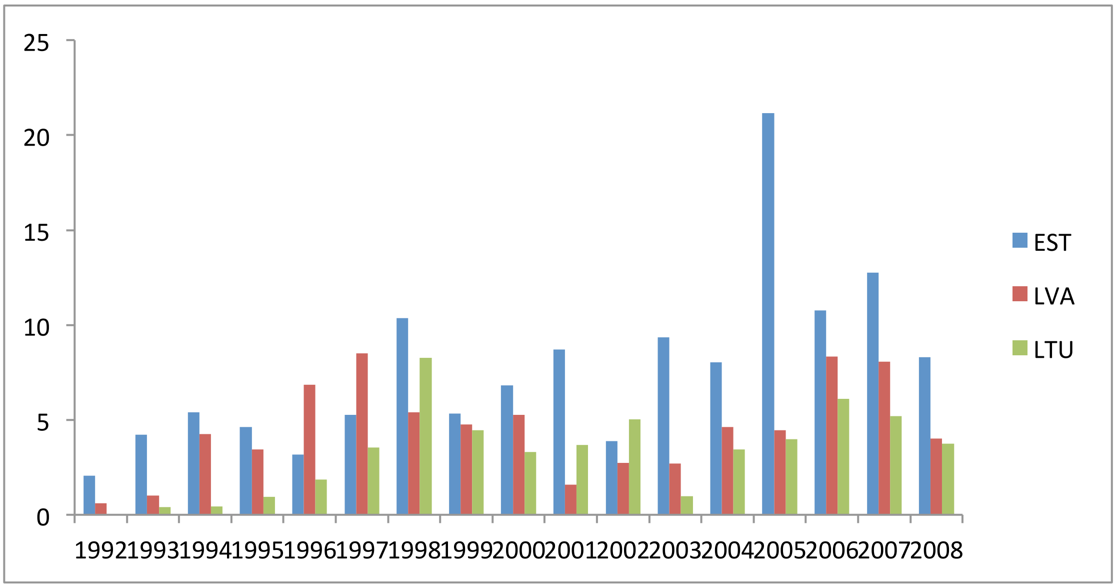
One has to distinguish between different phenomena. It has never been an option for Estonia to run a fundamentally different policy for openness to capital. If it had, growth would, in all probability, have been much slower and welfare would be much less than it is today: there would not have been sufficient levels of capital in the country. However, what Estonia failed to do was to manage its

[33] Several CIS countries continued to limit convertibility after independence.

macroeconomic framework in a diligent fashion, making the capital account a source of instability. The current account deficit shot up to extremely high levels, and inflation soared again – both indicators that the economy was overheating and on an unsustainable track. But for a while, the inflow of capital made an unsustainable situation possible.

As shown in Figure 6, net foreign direct investments have been positive every year since the monetary reform and have averaged at 7.66 percent of the gross domestic product a year. Latvia and Lithuania, too, have consistently showed positive inflows of FDI in the pre-crisis period, albeit at lower levels (Latvia's average is 4.5 percent and Lithuania's 3.5 percent). 2009 was the first year on record since independence when Estonia exhibited a net outflow of FDI.[34] But the level was not substantial – the net outflow of FDI from Estonia was around 50 million US dollars. Latvia and Lithuania, however kept a positive inflow of FDI.

Figure 6: Foreign Direct Investments (net inflows, % of GDP)



Source: World Bank, World Development Indicators

In the first years of the 1990s, foreign direct investments were largely constituted by foreign investors buying privatised companies. Many feared this would be a temporary peak subsequently followed by low or even negative net foreign direct investments, but the rapid restoration of the Estonian economy and its high growth has provided good reasons to invest in the country. In fact, the FDI inflows geared up after the privatisation programme. And the inflow growth is basically constituted by direct investments. These grew rapidly in the years up to 2005 while portfolio investment declined its share considerably. The pre-crisis figures for Estonia's international investment position showed the direct investments were five times the size of portfolio investments.

The FDI inflows have originated from several countries, but a major part has come from Sweden, Finland and the United Kingdom. The United States and Germany have also been large investors in Estonia. One of the key sectors for foreign investors have been the banking and financial sector, which are now almost totally owned by foreigners and have facilitated one of the most competitive

[34] EBRD (2010).

financial markets in Europe. The same is true for Latvia – and remains true despite recent and current problems in the banking sector. Despite the size of the contraction, the banking sector has shown resilience, and has outperformed the sector in many other transition countries. The estimated systemic financial risk due to the banking sector was very low before the onset of the crisis.[35] Yet, the high current account deficit was a destabilising force and a source of systemic risk.

Figure 5 also illustrates the difference between Estonia and the other two Baltic countries in attracting foreign direct investments. Except for three years (1996, 1997 and 2002), Estonia has had higher inflows of FDI and it has distanced the other two countries. Therefore, the Estonian FDI stock, the accumulated foreign direct investments, is considerably higher in Estonia than in Latvia and Lithuania. Measured as share of GDP, the Estonian inward FDI stock at the end of 2009 was 85 percent while it was around 45 percent in Latvia and 40 percent in Lithuania.[36]

4. The road to Frankfurt: the case for adopting the euro

On New Year's Day, Estonia will become a full member of the EMU and adopt the euro as its currency. The move is first and foremost politically motivated – it is the second crowning of Estonia's arduous re-orientation from the east to the west (the first crowning was the accession to the EU), or from central planning to constitutional democracy and market economy. The desire to belong to Europe has been a strong and galvanizing sentiment in Estonian politics throughout its post-independence period.

Yet it is also a natural evolvement for Estonia's economy. The Estonia kroon have been pegged to the euro for several years, and adoption of the euro will effectively not change the course of Estonia's exchange rate policy. For a small country like Estonia, with less than 1.5 million inhabitants, a floating currency is not really a safe choice. It has indeed worked well for a transition country like Poland. But Estonia is not Poland. Estonia's financial market is too illiquid and unstable for outsiders to do business in the local currency. Inevitably, the interest rate would have to follow the dominant actors in the region – the European Central Bank of course being the central actor.

Moreover, Estonia's trade sector (trade-to-GDP) is bigger than in most other countries, and has hovered around 160 percent in the past decade (see Figure 7). By comparison, the size of Poland's trade sector in 2008 was 84 percent. For a small and trade dependent country, there are benefits with sharing the same currency as your major trading partner. And Estonia's major trading partners are in the Eurozone. At least one third of Estonia's total trade is with euro members (Sweden is the second biggest trade partner, representing around 13 percent of Estonia's total trade) and the figure is likely to increase as some of the big trading partners – like Latvia and Lithuania – are likely to join the euro in a few years.

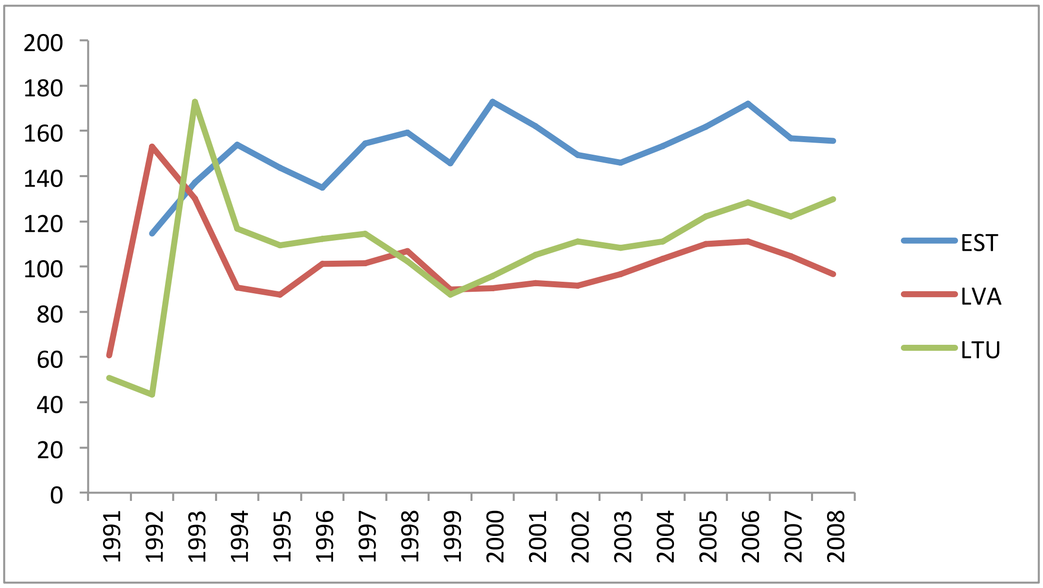
For a small and trade-dependent economy, which trades intensively with other members of the currency union, there are not that many strategic choices for monetary policy to choose between. Joining the euro club therefore makes sense. Yet it is not a risk-free strategy. Estonia will not have problems with the EMU fiscal straight jacket – it is already a fiscal hawk with stellar performance in the past two decades. And it is a country that accepts brutal cuts in fiscal expenditures if that is

[35] European Bank of Reconstruction and Development (2006), p. 45.

[36] The data on inward FDI stock was retrieved on August 19, 2010, from the UNCTAD FDI database.

necessary to maintain its fiscal conservatism. In the past two years, Estonia has cut its expenditure by a far bigger margin than countries like Greece or France. While groups in those countries have rioted against the cuts, Estonians have calmly accepted the shrinkage of expenditures.

Figure 7: Size of trade sector 1991-2008 (% of GDP)



Source: World Bank, World Development Indicators

Yet the future problem for Estonia is likely to be the greater need to cool its economy and credit expansion compared with other euro countries. Estonia is likely to return to high growth in a few years time. In contrast to what many members of the economics cognoscenti believed, Estonia did not go through an Argentinean-style fiscal crisis. Its crisis was not about deficits and an unsustainable build-up of debt. The crisis rather resembled the Asian financial crisis in the late 1990s. The economy (the private sector) overheated and the authorities (and banks) could and would not stop asset values (especially property) to morph into a giant bubble.[37] The crisis was financial, not structural, in nature. Hence, there are good reasons to believe that Estonia has a bright economic future.

Ideally, Estonia should have replaced its currency board with a new monetary order that could address its new economic challenges. Estonia's economy had matured by then, and it no longer needed the currency board to stabilize the economy (as in the early 1990s) and maintain fiscal discipline. A monetary order offering greater flexibilities, like a floating exchange rate regime and an orthodox central bank, could have helped to cool the economy. However, the cooling effect from the interest rate would have been marginal; had Estonia increased its interest rates it would have attracted larger inflows of foreign money. An appreciated currency would not have helped either – imports would have increased and the current account deficits would have expanded even more than it did. Other central bank operations would have helped, but only at the margin. So, in the end, Estonia was trapped in its monetary policy – there were no monetary policies around that profoundly would have changed the conditions for the financial sector. It had already made its bid for euro membership and was in the process to meet the criteria for accession; the tracks had thus already been laid for a new monetary order. Credit regulations could have helped – and capital account restrictions could have stemmed the tide of external finance pouring into Estonia – but these options

[37] Åslund (2010) lucidly puts forward this point.

were either not tried or was seen as impossible and associated with too big costs. Euro membership will actually give Estonia some new flexibilities, but the effects of them will be marginal. Its ability to avoid another cycle of boom-and-bust will be defined by its domestic economic and regulatory policy.

5. Bibliography

Bank of Estonia. 2006. *Estonian Preliminary Balance of Payment for the Year 2005*. Tallinn: Bank of Estonia

Berg, A., Borensztein, E., Sahay, R. and Zettelmeyer, J. 1999. *The Evolution of Output in Transition Economies: Explaining the Differences*. IMF Working Paper No. 99/73. Washington, D.C.: International Monetary Fund

Budina, N. and van Wijnbergen, S. 1997. Fiscal Policies in Eastern Europe. *Oxford Review of Economic Policy*, vol. 13(2): 47-64

Dellebrant, J.Å. 1991. Estonia's Economic Development 1940-1990 in Comparison with Finland. In *Market Socialism or the Restoration of Capitalism*, edited by A. Åslund. Cambridge: Cambridge University Press

European Bank for Reconstruction and Development (EBRD). 2005. *Transition Report 2005*. London: EBRD

European Bank for Reconstruction and Development (EBRD). 1997. *Transition Report 1997*. London: EBRD

European Bank for Reconstruction and Development (EBRD). 1995. *Transition Report 2000*. London: EBRD

Falcetti, E., Lysenko, T. and Sanfey, P. 2005. *Reforms and Growth in Transition: Re-examining the Evidence*. Working Paper No. 90. London: European Bank for Reconstruction and Development

Ghosh, A.R., Gulde, A-M., and Wolf, H. 1998. *Currency Boards: The Ultimate Fix?* IMF Working Paper No. 98/8. Washington, D.C.: International Monetary Fund

Ghosh, A.R., Gulde, A-M., Ostry, J. and Wolf, H. 1996. *Does the Exchange Rate Regime Matter for Inflation and Growth?* IMF Economic Issues 2. Washington, D.C.: International Monetary Fund

Gillies, J., Leimann, J. and Peterson, R. 2002. Making a Successful Transition from a Command to a Market Economy: The Lessons from Estonia. *Corporate Governance: An International Review* 10 (3): 175-186

Gwartney, J and Lawson R. 2009. *Economic Freedom of the World: 2009 Annual Report*. Vancouver: Fraser Institute

Hanke, S., Jonung, L., and Schuler, K. 1993. *Russian Currency and Finance: A Currency Board Approach to Reform*. London: Routledge

Hanke, S., Jonung, L., and Schuler, K. 1992. *A Monetary Reform for a Free Estonia: A Currency Board Solution*. Stockholm: SNS Förlag

Hinnosaar, M. and Rõõm, T. 2003. *The Impact of Minimum Wage on the Labour Market in Estonia: An Empirical Analysis*. Bank of Estonia Working Papers No. 2003/08. Tallinn: Bank of Estonia

International Monetary Fund. 2005. *Republic of Estonia: Selected Issues*. IMF Country Report No. 05/395. Washington, D.C.: International Monetary Fund

International Monetary Fund. 1999. *Republic of Estonia: Selected issues and Statistical Appendix*. IMF Staff Country Report No. 99/74. Washington, D.C: International Monetary Fund

Johnson, S., Kaufmann, D. and Shleifer, A. 1997. The Unofficial Economy in Transition. *Brookings Paper on Economic Activity* 27 (2): 159-239

Kallas, S. and Sörg, M. 1995. Currency Reform. In *Transforming the Estonian Economy*, edited by Lugus, O. and Hachey, G.A., pp 71-91. Tallinn: International Centre for Economic Growth

Kallas, S. and Sörg, M. 1994. *Currency Reform in Estonia*. Reform Round Table Working Paper No. 9. Tallinn: Estonian Academy of Science

Knöbl, A., Sutt, A, and Zavoico, B. 2002. *The Estonian Currency Board: Its Introduction and Role in the Early Success of Estonia's Transition to a Market Economy*. IMF Working Paper No. 02/96. Washington, D.C.: International Monetary Fund

Laar, M. 2002. *Little Country That Could*. London: Centre for Research into Post-Communist Economies

Lainela, S. and Sutela, P. 1994. *The Baltic Economies in Transition*. Helsinki: Bank of Finland

Lipton, D. and Sachs, J. 1990. Creating a Market in Eastern Europe: The Case of Poland. *Brookings Paper on Economic Activity* 20 (1): 75-147

Ross, M. and Lättemäe, R. 2004. EMU Accession Issues in Estonia. *Comparative Economic Studies* 46 (1): 146-158.

Rostow, W.W. 1960. *The Stages of Economic Growth*. Cambridge: Cambridge University Press

Sachs, J. and Warner, A. 1996. *Achieving Rapid Growth in the Transition Economies of Central Europe*. Harvard Institute for International Development Discussion Paper No. 544. Cambridge, Mass: Harvard University

Sachs, J. 1993. *Poland's Jump to the Market Economy*. Cambridge, Mass: The MIT Press

Sachs, J. and Lipton, D. 1992. Russia: Towards a Market-Based Monetary System. *Central Banking*, summer: 29-53

Sepp, U. and Randveer, M. 2002. *The Sustainability of the Estonian Currency Board Arrangement*. Working Paper No. 9. Budapest: International Centre for Economic Growth

Stepanyan, V. 2003. *Reforming Tax Systems: Experience of the Baltics, Russia, and Other Countries of the Former Soviet Union*. IMF Working Paper No. 03/173. Washington, D.C.: International Monetary Fund

Sumilo, E. 2006. Trade and Trade Policy Developments in the Baltic States after Regaining Independence Before Joining the EU. University of Latvia: Paper prepared for the XIV International Economic History Congress in Helsinki, August 21-25, 2006. [Online]. Available at: http://www.helsinki.fi/iehc2006/papers3/Sumilo.pdf [Accessed: June 15th 2010]

Tubalkain-Trell, M. 2009. 'Baltics, Bulgaria Next for Devaluation'. Baltic Business News, February 5, 2009. Accessed on December 28 at http://www.balticbusinessnews.com/?PublicationId=c5343566-4b99-48f7-842d-aa557eb854ed

Ummelas, U. 2010. 'Estonia, Long-Time Ireland Follower, Bets on Euro'. Bloomberg/Business Week, December 23, 1010. Accessed on December 28 at http://www.businessweek.com/news/2010-12-23/estonia-long-time-ireland-follower-bets-on-euro.html

World Bank. 1996. *World Bank Development Report 1996: From Plan to Market*. Oxford: Oxford University Press

World Bank. 1993. *Estonia: The Transition to a Market Economy*. Washington, D.C.: World Bank

Åslund, A. 2010. *The Last shall be the First: The East European Financial Crisis*. Washington, D.C.: Peterson Institute for International Economics

Åslund, A. 2002. *Building Capitalism: The Transformation of the Former Soviet Bloc*. Cambridge, Mass.: Cambridge University Press

Åslund, A. 2001. *The Myth of Output Collapse After Communism*. Carnegie Endowment Working Paper No. 18. Washington, D.C.: Carnegie Endowment for International Peace

Åslund, A. and Jenish, N. 2006. *The Eurasian Growth Paradox*. Working Paper No. 06-5. Washington, D.C.: Institute for International Economics

Åslund, A., Boone, P. and Johnson, S. 1996. How to Stabilize: Lessons from Post Communist Countries. *Brookings Paper on Economic Activity* 26 (1): 217-313