VII. RESERVE MANAGEMENT

The objective of Eesti Pank's foreign exchange reserves is to secure the stability of the Estonian kroon. Pursuant to the principles of the currency board, the foreign exchange reserves must cover Eesti Pank's kroon liabilities, including the issued banknotes and coins and the accounts of commercial banks with Eesti Pank. The central bank acts within a framework that identifies and assesses the risks of reserve management operations and follows the management of risks within acceptable parameters and levels. Reserve asset portfolio has a priority for **liquidity** and **security** before profit. At the end of 2001 the foreign exchange reserves totalled **14.6 billion kroons**. The changes in the calculation method of the reserves during 2001 reduced the size of the reserve by approximately 6%. The liabilities-free net reserves totalled **2.5 billion kroons**.

Organisation of Reserve Management

Foreign Exchange Reserve Structure

The reserve is subdivided into two 'tranches' – **the liquidity buffer and the investment portfolio**. In accordance with operating the currency board mechanism, the liquidity buffer consists of the most liquid and risk adverse assets. The liquidity buffer covers the monthly foreign exchange requirement of the banking system with 95% probability and makes up approximately 5% of the total reserves.

The objective of the investment portfolio is to generate reasonable earnings over the medium to long term, subject to liquidity, market and credit risk constraints. The investment portfolio consists mainly of government securities of the leading industrial countries of the world. Risks are managed through optimal diversification of the investment portfolios' structure and careful selection of instruments and counterparties. Risk limits are monitored in real time. A small part of the reserves (*ca* 0.28%) is held in gold.

As the Estonian kroon is pegged to the euro, the base currency of Eesti Pank's foreign exchange reserves is the euro and investments in euro form the predominant part of the reserve structure. Portfolio foreign exchange exposure must be hedged into euro, thereby eliminating the impact of adverse currency movements on the value of the reserves.

The investment portfolio's benchmark is made operational through an actual **benchmark portfolio** which includes chosen currencies with desired weights, investment instruments with appropriate credit characteristics and duration which reflects the desired level of interest rate risk. There are limits on the size of any deviation from the benchmark in terms of currency, credit or duration that are permitted in managing the actual investment portfolio.

Interest rate risk is managed by establishing benchmarks with a given duration and by limiting the actual portfolio's deviation in terms of duration and yield curve mismatches. **Credit risk** is managed by limits on eligible issuers and counterparties based on their ratings.

Investment Procedure

The Financial Markets Department is the reserve management entity at Eesti Pank. The department's activities are based on the **general investment principles and guidelines** for foreign reserve management approved by the Governor of Eesti Pank. The decision-making process is subdivided into the strategic and tactical levels.

A strategic decision is based mainly on macroeconomic analysis and forecasts. It is made with a three to six month perspective and is executed by determining country weights and assuming of a bigger or smaller risk compared to the benchmark portfolio.

A tactical investment decision is made with a short-term perspective taking into consideration all market moving indicators.

Risk exposures are monitored in real time to determine whether exposures have been extended beyond acceptable limits. Regular position reports together with associated risks and results are submitted to the management and to internal audit.

Factors Influencing Investment Results in 2001

As far as reserve management was concerned, the year 2001 was unusual in many respects; therefore, the return on the reserves exceeded the forecast by 23%. The trends in the world economy, the September 11 events and the continuing reform of the Estonian monetary policy were the main influencing factors.

Difference of Market Expectations Compared to Actual Situation

At the end of 2000 the global economy performed rather favorably although several indicators were already pointing to a rapid slowdown of economic growth. Still, the dominating opinion was that the slowdown would only last for six months followed by a pickup thereafter. In reality, the slowdown of economic growth in the developed economies lasted longer and was far more extensive than anticipated.

Central banks and governments of the developed countries responded to the slowdown of growth with expansive economic policies. Based on the situation at the end of 2000, Eesti Pank forecasted a moderate, 0.5% decrease of interest rates in the US as well as the euro area in 2001. In actual act, the US interest rates were reduced by 4.75 percentage points and in euro area by 1.5 percentage points, thereby generating a better than forecasted return on foreign reserves of Eesti Pank[1] (see Figure 7.1).

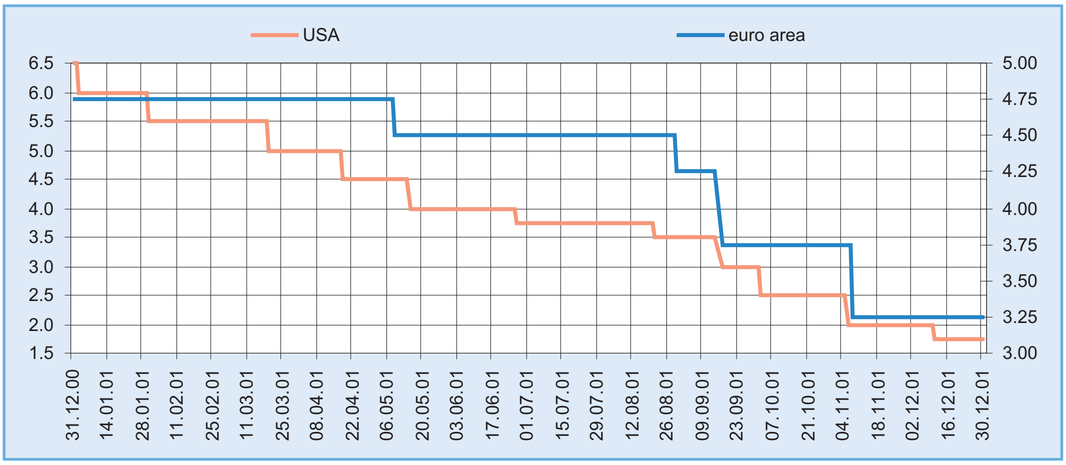

Figure 7.1. Base interests of the United States (the left scale) and the European Central Bank (the right scale)

[1] See also World Economy, pp 11–13.

Aftermath of the Terrorist Attack against USA

The September 11 events triggered changes in the behaviour of the financial markets as well as the consumers. The stock markets in the USA stayed closed for nearly a week after the attacks. Even though trading in US bonds continued in Europe, there was no liquidity, which distorted prices. The central banks of the world agreed on executing only unavoidable trades in order to restrain market volatility.

However, the feared collapse expected after the reopening of the stock markets did not eventuate. This was ensured by temporary market regulations as well as wide based patriotism. The impact of the September 11 events on the US economy was initially overestimated by the markets, therefore, considerable correction in interest rates to the upside took place at the end of the year (see Figure 7.2).

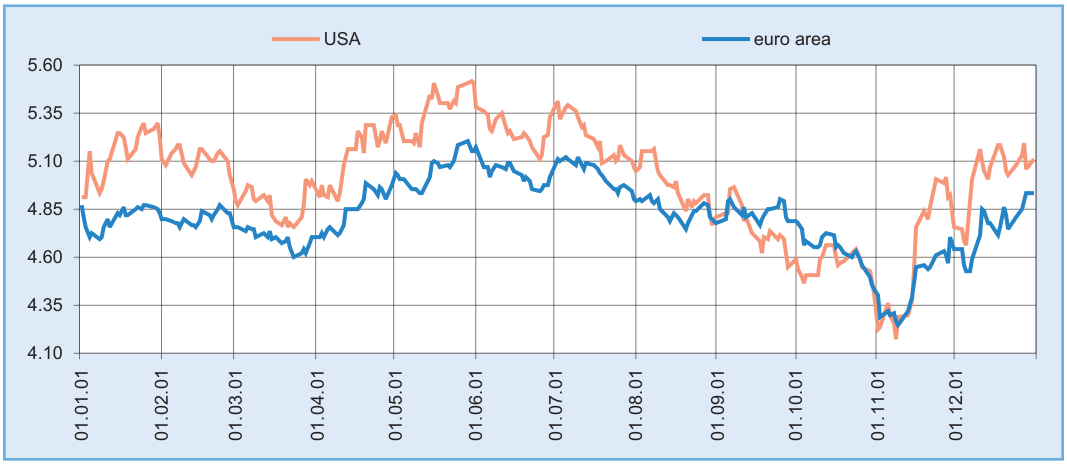

Figure 7.2. Interests of ten-year bonds in the United States and euro area

The terrorist attacks of September 11 tested the security of Eesti Pank's reserve management in regards to financial and operational risks, which are extremely difficult to foresee and control and the results turned out to be satisfactory in every way.

Impact of Monetary Policy Operational Framework Reform

The reform of the monetary policy framework enabled the local banks to reduce the required kroon deposits with Eesti Pank. This was implemented in two stages: as of 1 January the required kroon deposits could be reduced to 75%, as of 1 July to 50%. It was assumed that the change would entail two rapid decreases in the size of the foreign currency reserves. Even though it was possible to forecast the maximum decrease, it was difficult to predict how the banks would actually realise the adjustments. Such uncertainly forced the central bank to maintain a significantly larger liquidity buffer than usual.

Figure 7.3 illustrates the actual change in the size of the foreign exchange reserves. It clearly indicates the stages of change in the required reserves. While the first stage, which started in January, required up to three months for the banks to implement, the second stage in July took no time at all. In total, the foreign exchange reserves decreased by *ca* 2 billion kroons, which constituted 14% of the total reserves. Without the above changes the foreign reserves grew at the usual rate. Over the year the reserve decreased by approximately 200 million kroons.

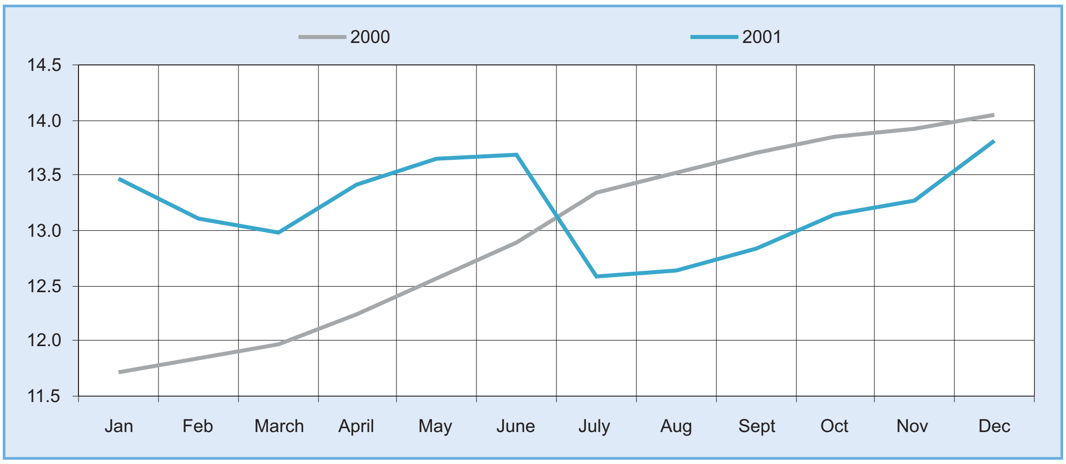

Figure 7.3. ***Foreign exchange reserve (EEK billion)***

Amendment of Investment Principles in 2001

Benchmark Portfolio

A benchmark portfolio represents an investment with an acceptable risk and return ratio for an investor.

In 2001 Eesti Pank's benchmark portfolio was based on the assumption of generating at least positive quarterly results with 95% probability. SSB World Government Bond Indices were used[2].

On the other hand, a benchmark portfolio is also a passive strategy that can be called upon in uncertain times or when an investor lacks a clear vision of markets, eg when markets send out conflicting signals or when they are interpreted differently.

It is impossible to accurately predict how much interest rates with various maturities will change in the future. However, the likely deviations can be forecast with great probability. Standard deviations can be calculated using empirical data (assuming that the volatility of the market will remain unchanged) as well as the value of respective interest rate options (assuming that market changes will not exceed the forecast limits).

The neutral duration of the benchmark for Eesti Pank in 2001 were set at 2.3 years for the euro area and 1.9 years for the US bonds.

The optimum benchmark portfolio is risk-wise evenly distributed across the yield curve. In order to ensure the best return, a portfolio is made up of weighted subindices in various market segments. Such co-weighting depends on the volatility of segments and the expected average return. Changes to the benchmark are triggered by changes in market structures or characteristics that alter the investment environment.

In 2001 the average interest rates dropped quite significantly and the price fluctuations were prevalent. Both influence the passive investment strategy, which is the basis for establishing the benchmark portfolio (see Figure 7.4). In November, in response to the changes in the investment environment, the

[2] SSB – Salomon Smith Barney – an investment bank that publishes average return indicators of federal bonds and respective indices.

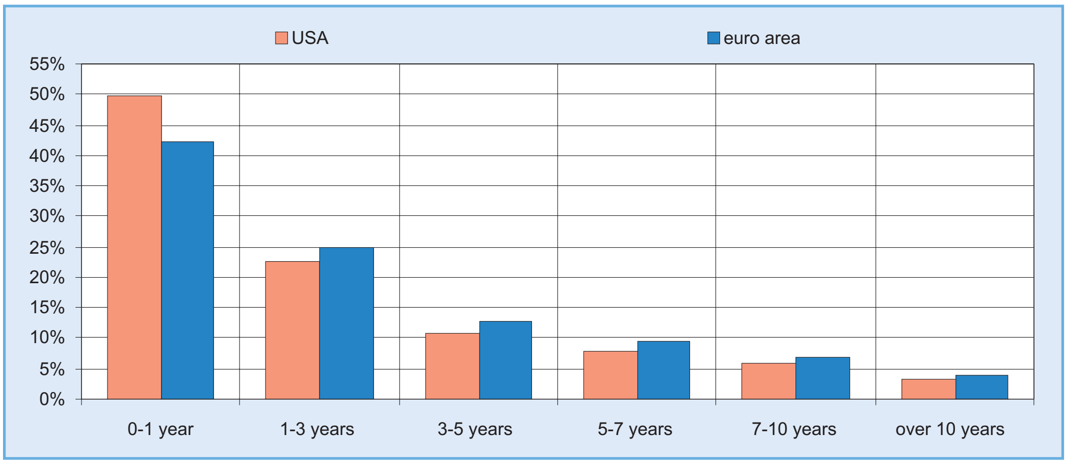

Figure 7.4. Structure of benchmark portfolios in 2001

Monetary Policy Committee of Eesti Pank made the decision to change the structure of the benchmark portfolio. It was decided to **reduce the average investment term, ie lowering the general risk level of the benchmark portfolio**. The decision was justified since the interest rate level had dropped over the year. To maintain the quarterly positive return, which is the fundamental criterion of foreign exchange reserves management, the general risk level had to be brought in line with the market volatility. The timing of this decision proved to be perfect as the fall of the long-term interest rates stopped in the same month (see Figure 7.2).

Table 7.1 illustrates how the general risk level[3] was decreased by more than 10% which as of November would guarantee with 95% probability positive quarterly return on the reserves. Alongside with the general risk level, the sensitivity to interest rate changes measured by the benchmark portfolio term also decreased and the part of short-term investment positions increased.

Table 7.1. Changes in the structure of benchmark portfolios in 2001

	up to 1 year	1-3 years	3-5 years	5-7 years	7-10 years	over 10 years	Duration	General value at risk
December 2001								
USD	46%	26%	13%	9%	7%		1.78	1.50
EUR	52%	21%	11%	8%	6%	3%	1.93	1.39
Total	**49%**	**23%**	**12%**	**8%**	**6%**	**2%**	**1.87**	**1.43**
November 2001								
USD	50%	22%	11%	8%	6%	3%	1.90	1.65
EMU	42%	25%	13%	9%	7%	4%	2.33	1.57
Total	**45%**	**24%**	**12%**	**9%**	**6%**	**4%**	**2.16**	**1.60**

External Asset Managers

Eesti Pank has followed several objectives when involving external asset managers: improving efficiency, reducing volatility of results and obtaining additional know-how.

Since the restrictions and standards set to the external asset manager and the Eesti Pank's reserve management unit were identical, the efficiency was easy to compare and depended solely on investment

[3] Value at risk – VAR.

decisions. The cumulative returns differed only marginally (see Figure 7.5). However, there was one essential difference – Eesti Pank's investment professionals are far more risk averse in their investment decisions compared to the external asset managers.

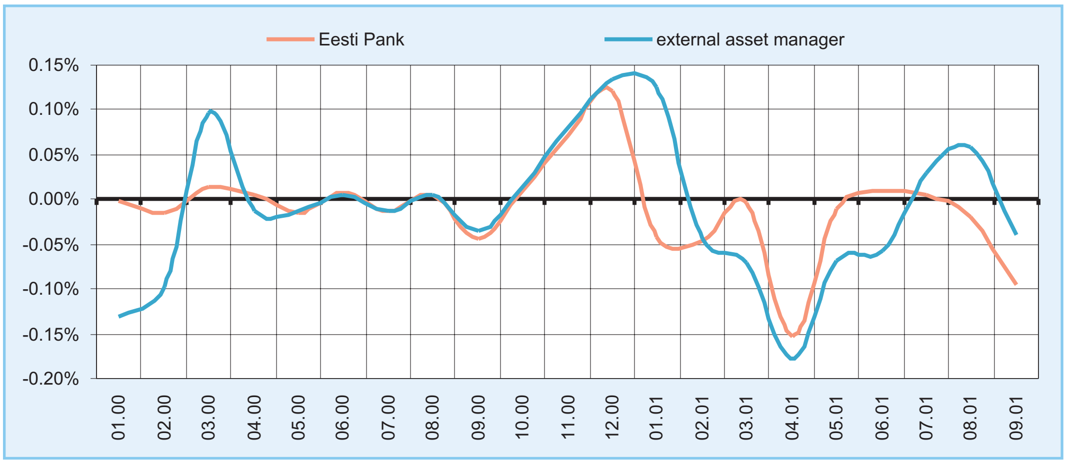

Figure 7.5. Excess return generated by Eesti Pank versus the external asset manager

Based on the experience so far, Eesti Pank decided to change the principles of external asset management. The asset manager is now assigned to manage only such investment decisions, which differ from the benchmark portfolio. This should improve efficiency, which will also be supported by the performance based fee system. More than one mandate will be awarded which should ensure lower volatility and a return in excess of the average market return over a longer period.

Foreign Exchange Reserve Investment Results in 2001

When in 2000 the global tightening of monetary policy still continued, 2001 was the year of considerable monetary easing. Despite a major reduction of different countries base rates, long-term interest rates at the year-end remained practically at the same level as at the beginning of the year.

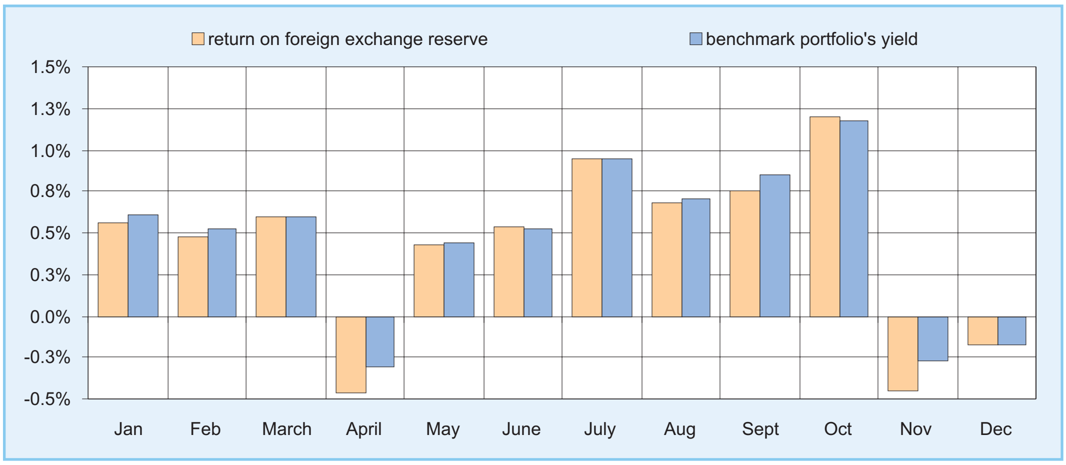

Figure 7.6. Return on the foreign exchange reserve in 2001

While in 2000 Eesti Pank earned additional income primarily due to the fall of long-term interest rates, in 2001 additional income was earned from the fall of short- and medium-term interest rates. In 2001 the annual yield on foreign exchange reserves was 5.22%. Figure 7.6 also illustrates the return on the foreign exchange reserve. When analysing the results, it has to be taken into account that, as already mentioned before, the year 2001 was extraordinary in certain aspects from the viewpoint of reserve management.