VIII. RESERVE MANAGEMENT

Eesti Pank's foreign exchange reserves serve as the cover of the Estonian kroon and the main objective of the reserves is to secure the stability of the national currency. Pursuant to the principles of the currency board, the foreign exchange reserves must cover all Eesti Pank's kroon liabilities, including the issued banknotes and coins and the accounts of commercial banks with Eesti Pank. The central bank proceeds from strict risk constraints in investing the reserves and the primary goal is **preservation of assets** before profit.

ORGANISATION OF RESERVE MANAGEMENT

Foreign Exchange Reserve Structure

The reserve is subdivided into two – **the liquidity buffer** and **the investment portfolio.** The former consists of highly liquid assets that the central bank can use at any time for exchange transactions with domestic credit institutions in order to operate the currency board system. These assets cover the monthly foreign currency demand of the banking system and make up approximately 5% of the total reserves. The second, larger part of the foreign exchange reserves is used for investments in international financial markets. The objective of the investment portfolio is **to generate optimum earnings above the money market interest rate during a global economic cycle, subject to the imposed constraints.**

Assets of the investment portfolio are mainly invested in the liquid bond markets of leading industrial countries. It is important to achieve optimum balance of risk and return in investing foreign exchange reserve in debt securities. The main risk factors concern exchange rate, interest rate, credit and liquidity risks. These are measured and managed through optimum diversification of the investment portfolio and careful choice of instruments and counterparts. General rules apply to each of the risks mentioned that exclude taking risks unacceptable for the central bank. Risk limits are being constantly monitored and usually in real time. All risk limits depend on the size of Eesti Pank's free reserves. A small part of the reserves is held in gold.

As a rule, the central bank takes no **currency risk,** which is fully hedged by **matching the structure of Eesti Pank's assets and liabilities.** As the Estonian kroon is pegged to the euro, the base currency of the foreign exchange reserves is the euro and investments in euro dominate in the reserve structure. Derivatives are used to hedge currency risks of investments outside the euro markets. Therefore, exchange rate changes have no significant impact on the value of the reserves.

As Eesti Pank cannot avoid **interest rate risk,** this is actively managed through a **benchmark portfolio, which determines the average risk level the central bank is prepared to take** and at the same time also serves as the standard for reserve management efficiency. There are also limits to the deviation from the benchmark portfolio, which allow the bank to use forecasts and achieve results different from those of the benchmark portfolio.

Although the liquidity buffer has been separated from foreign exchange reserves, high liquidity requirements apply to the investment portfolio as well. In order to guarantee high liquidity, only **instruments with a liquid secondary market are used.** Limits have also been set on the volume of issue and share of the securities Eesti Pank is allowed to own.

Credit risk or the chance of default is managed through **limits regarding issuers and the size and proportion of instruments,** based on the ratings of leading international rating agencies. The bulk of the reserve is invested into government securities and reverse repo transactions, which bear a minimum risk.

A strategic investment decision is made on the basis of macroeconomic analysis and forecasts. It is made with a three to six month horizon and it means determining geographic asset allocation and the level of excess risk against the benchmark portfolio.

The horizon of a tactical investment decision is shorter and it is made considering such market indicators as the current level of financial markets, recent dynamics, interest rate differentials across countries, etc.

2002 RESULTS

Foreign Exchange Reserve Investments

As at the end of 2002, the foreign exchange reserves totalled **15 billion kroons.** The annual increase was approximately 2%. The net reserve accounted for approximately 21% of the total reserve, or **3.1 billion kroons,** growing by approximately 21% year-on-year. The rapid increase of the net reserve was based on profitable investments.

In 2002, the developments in the world economy and financial market differed significantly from forecasts and, as a result, foreign exchange reserve investment results were considerably different from those expected. **Due to extraordinary events, the return on investments reached 6.22% instead of the planned 2.9%.** The cumulative return can be seen on Figure 8.1.

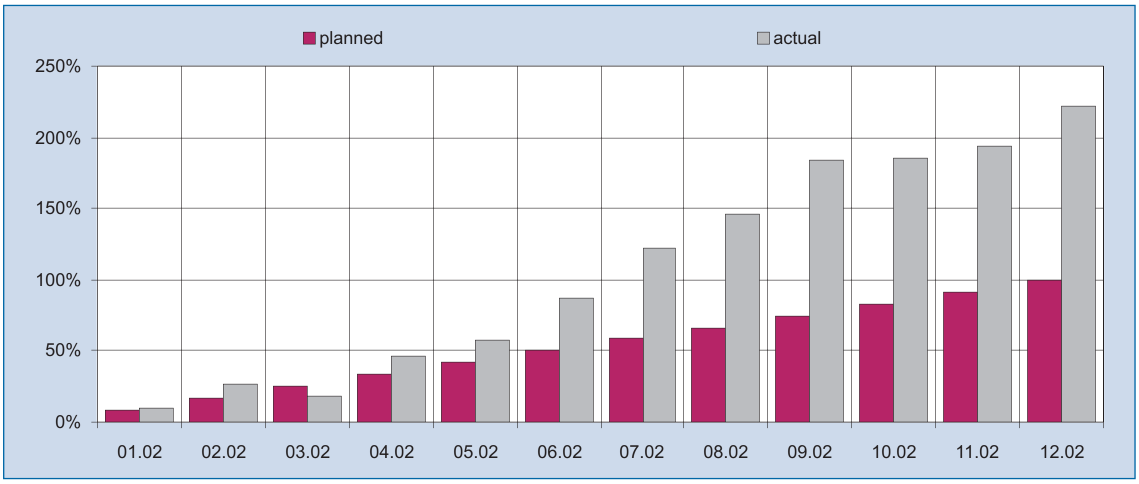

Figure 8.1. Cumulative return on foreign exchange reserve investments in 2002

The results of applying the benchmark portfolio principle are explained in Figure 8.2, where the return on the foreign exchange reserves is compared to the money market return in recent years.

The return on investments that was above the return of the benchmark portfolio varied greatly during the year, as market developments were difficult to predict (see Figure 8.3).

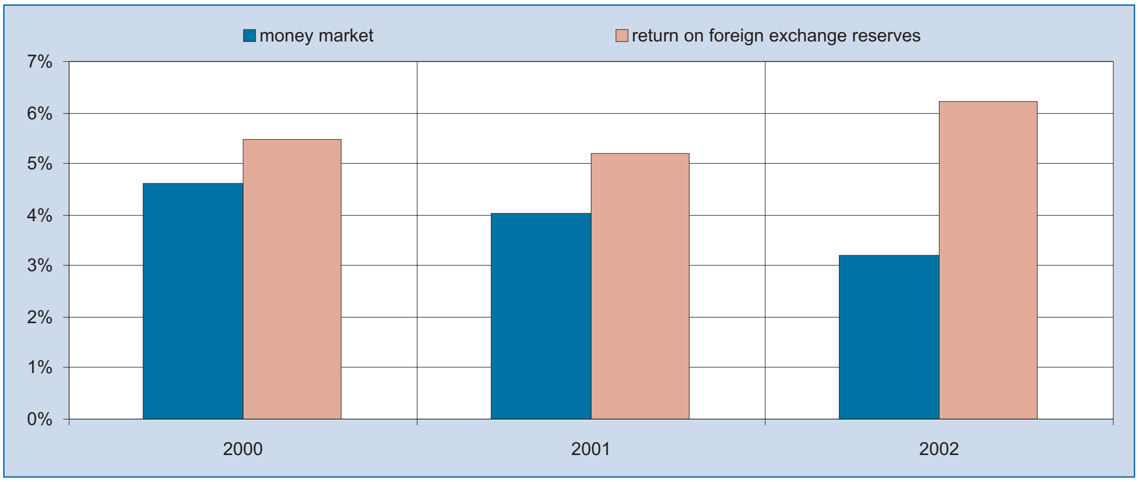

Figure 8.2. Return on foreign exchange reserves compared to the money market

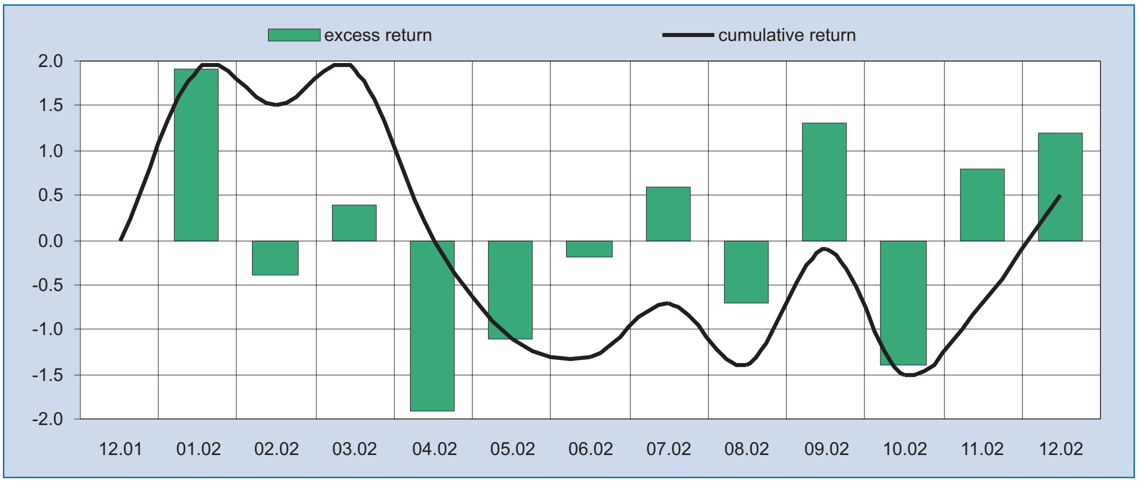

Figure 8.3. Excess return above the return of the benchmark portfolio in 2002 (in basis points)

Investment Environment

In 2001, GDP growth slowed considerably in major economic regions. The 2002 forecasts were moderate as well: the GDP of the USA was expected to increase by only 0.9% and by 1.2% in the euro area[1].

Despite weak growth forecasts, markets expected the increase of both short- and long-term interest rates. In the US, three-month rates were expected to increase by two and 10-year rates by approximately 0.5 percentage

[1] Source: Consensus Forecasts. See also World Economy, pp 13–23.

points, in the euro area by 0.6 and 0.3 percentage points, respectively[2]. These expectations were based on the belief that the world economy would come out of recession in the first half-year and that the trend-line growth rate would be restored in the second half of the year. Therefore, markets counted on the possibility that the US Federal Reserve and the European Central Bank may raise base rates in order to make the growth-stimulating monetary policy more neutral.

Compared to market expectations, Eesti Pank's interest rate forecast was more moderate and considered the possibility that economic recovery in the US and the euro area can be slower than expected and thus the decline of base rates can continue.

The development of the markets of the US and the euro area differed considerably from the forecast and interest rates decreased instead of increasing. Base rates were lowered in both the US and the euro area by 0.5 percentage points (to 1.25 and 2.75%, respectively); 10-year interest rates fell even more. Due to the fall of interest rates, Eesti Pank earned more than forecast from foreign exchange reserves (see Figure 8.4).

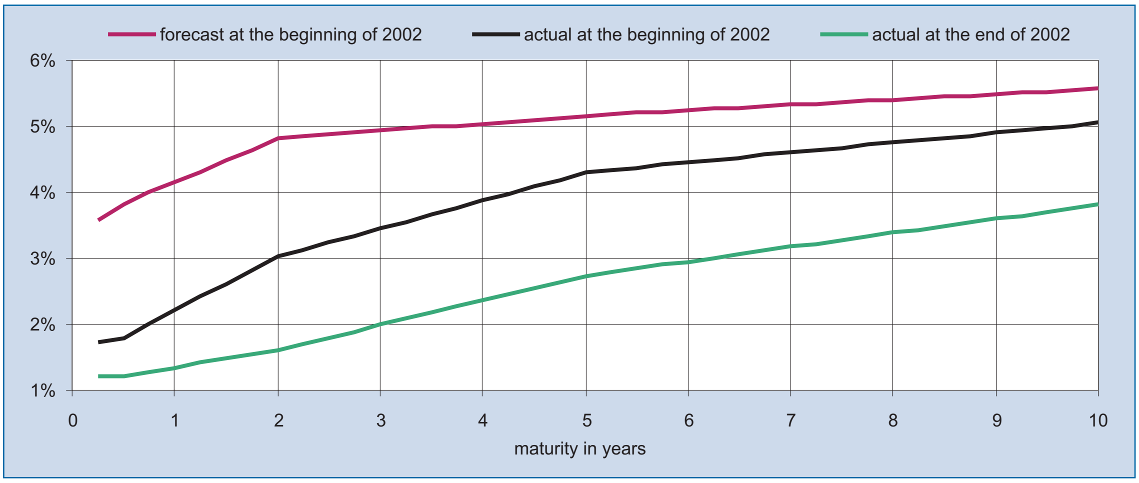

Figure 8.4. Forecast and actual US yield curve by maturity

There were several reasons why the actual development differed from forecasts. First, a broad decline occurred in stock markets[3]. This increased demand for government bonds, bringing down their interest rates. This relationship is illustrated in Figure 8.5.

Secondly, recovery was controversial – in the second half of the year the growth rate of industrial production decreased and several risks indicated that it could slow down even further. Although the US annual growth turned out higher than expected (the GDP grew by 2.4%), it was still uncertain whether such growth would be sustainable and when would the trend-line development continue. In the euro area, interest rate dynamics was affected by weaker than expected economic growth and the danger of economic recession, particularly in Germany. The euro area growth was also held back by the strengthening of the euro against the dollar, as due to weak domestic demand the economic growth of the region depended considerably on external demand.

Thirdly, interest rates were brought down by the increase of geopolitical risks. Those risks pushed the price of oil over 30 dollars a barrel, which had a negative effect on the outlook of economic growth and stimulated demand for less risky investments.

[2] Market expectations have been derived from the yield curve of swap instruments.
[3] See International Financial and Commodity Markets, pp 21–22.

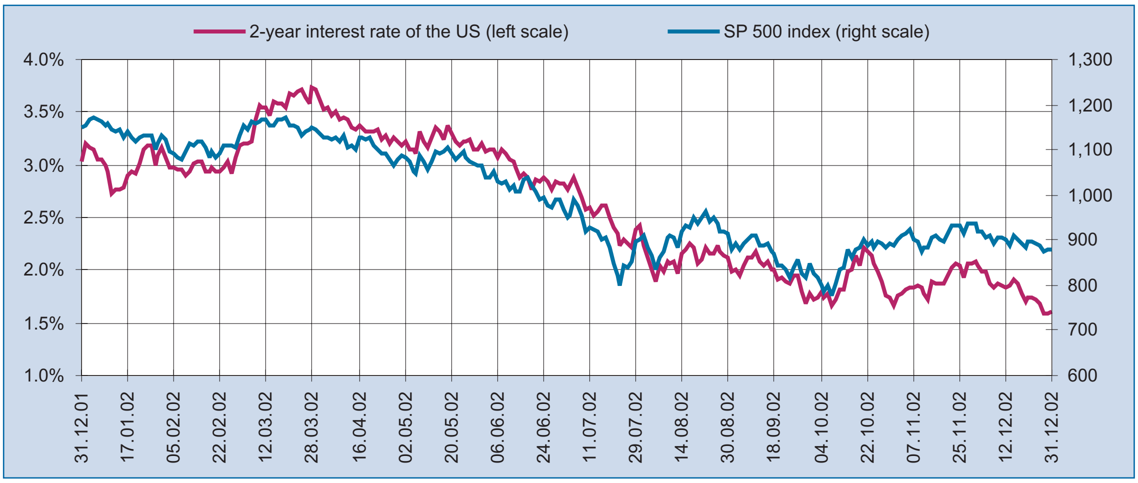

Figure 8.5. Interest rate and stock market in 2002

Changes in Benchmark Portfolio

Eesti Pank's foreign exchange reserve benchmark portfolio is based on the criterion that the quarterly result must be positive, ie the assets are preserved. If the structure of the benchmark portfolio no longer ensures this, due to the fall of market rates and/or higher volatility, the risk level of the portfolio has to be lowered. When market rates increase and/or their volatility decreases, the risk level of the benchmark portfolio can be increased. Eesti Pank's Monetary Policy Committee considers changing the benchmark portfolio when the average terms of the theoretical and benchmark portfolios differ by more than 10%.

Lowering of the risk level of the benchmark portfolio, in essence, means reducing the average investment duration – more assets are invested into low volatility money market instruments. As a result, the accumulated interests compensate for the volatility-caused potential price fluctuations.

The fall of interest rates called for the change in the structure of the benchmark portfolio at the end of the third quarter of 2002. As interest rates had fallen relatively fast over the year, particularly in the US (see Figure 8.6), the risk level of the portfolios had to be reduced. The duration of the US portfolio was cut by half – from

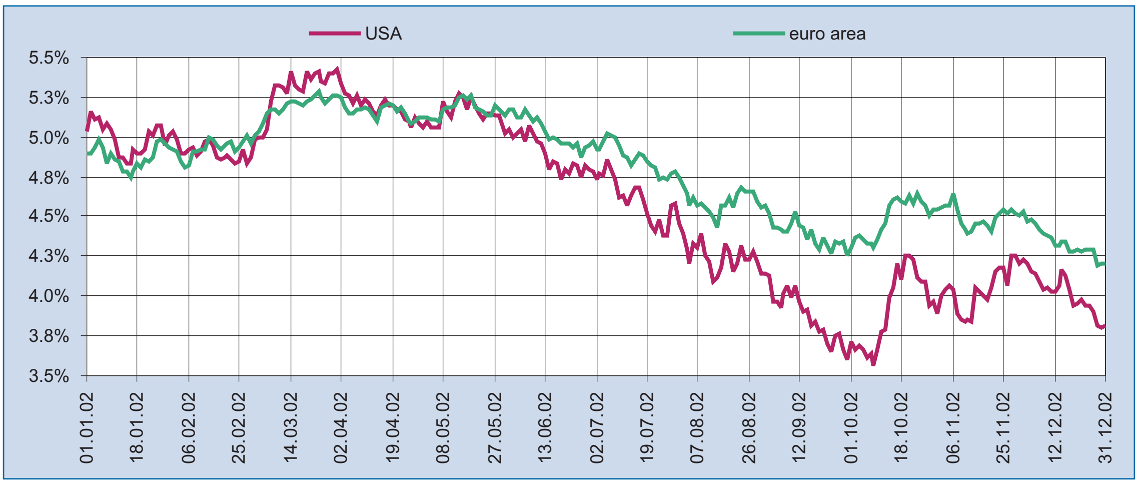

Figure 8.6. Interests of ten-year bonds in the United States and euro area

1.8 to 0.9 years – and the duration of the euro area portfolio was shortened from 1.93 to 1.44 years. The structure of the new benchmark portfolio, which the Monetary Policy Committee of Eesti Pank endorsed in the fourth quarter of 2002, is given in Table 8.1. The average duration of the new benchmark portfolio is 1.23 years, whereas the weight of economic regions remained unchanged.

Table 8.1. Structure of Eesti Pank benchmark portfolio since the 4th quarter of 2002

Economic region	1 month	1-3 years	3-5 years	5-7 years	7-10 years	Over 10 years	Duration	Share
Euro area	65.15%	15.06%	7.93%	5.48%	4.05%	2.33%	1.438	60%
USA	73.57%	13.04%	6.03%	4.18%	3.18%	0.00%	0.905	40%

New Principles of Risk Management

In August 2002, the first external asset management mandate was awarded based on the principles of the new External Asset Management Programme. While in earlier years the external asset manager had to manage a certain part of the foreign exchange reserves and this part was allocated to the manager, then since August 2002 the external manager is only allowed to use a certain portion of the risk limit.

Under the new mandate, the asset manager has the right to take, on behalf of Eesti Pank, market risks defined in the contract through derivative instruments. The cash amount allocated to an asset manager serves primarily the purpose of fulfilling margin requirements in futures contracts and is therefore significantly smaller than in the case of previous mandates. Additionally, while so far the asset management fee depended on the size of assets under management, then now it depends largely only on the excess return earned by the manager. Eesti Pank plans to award several other mandates in the near future.

The results of the external asset manager were relatively good in 2002 – more than four million kroons makes the annual return of 4.32%. Eesti Pank was generally satisfied with the performance of the external manager as the return exceeded the respective benchmark return. The risks taken were slightly more moderate than expected but the results were relatively good, particularly in case of the foreign exchange mandate.

Strategic risk-taking in Eesti Pank is based on similar principles with the external asset manager. The investment decisions realised through derivatives within the risk limits allow more effective management of the benchmark portfolio and more precise calculation of the investment results related to different risk-taking. Trading in derivatives is not more complicated than trading with classical instruments and the liquidity, as a rule, is high. However, the choice of instruments is narrower than with bonds, which sets certain constraints to trading. Nevertheless, risk-taking is possible in all risk categories allowed to Eesti Pank. Derivatives are a particularly convenient way of quickly and efficiently realising various strategic investment decisions, combining more than one risk category and/or instrument.

Providing Asset Management Services to Public Sector

The workload of the middle office (risk management section of the Financial Markets Department) increased at the end of the year, as the risk management task of the Stabilisation Reserve was handed over to Eesti Pank by State Treasury. The implementation of a benchmark portfolio and more efficient risk management procedures will ensure more stable and efficient investments of assets of the Stabilisation Reserve. The investment decisions are still made by the State Treasury.

The full package of asset management services is provided to the Guarantee Fund.

TEN YEARS OF FOREIGN EXCHANGE RESERVE MANAGEMENT

The reserve management of Eesti Pank has developed rapidly and successfully over the past ten years and has technologically reached the top level of world central banks. One prerequisite of this has been the small size of the country and its central bank and the resulting flexibility, as well as the favourable starting position – when beginning practically from scratch it is possible to apply the best technologies available at the time. The foreign exchange reserve itself has also increased considerably – from 718 million kroons to 15 billion kroons (see Figure 8.7), first and foremost on the account of issued banknotes and coins and growing bank deposits.

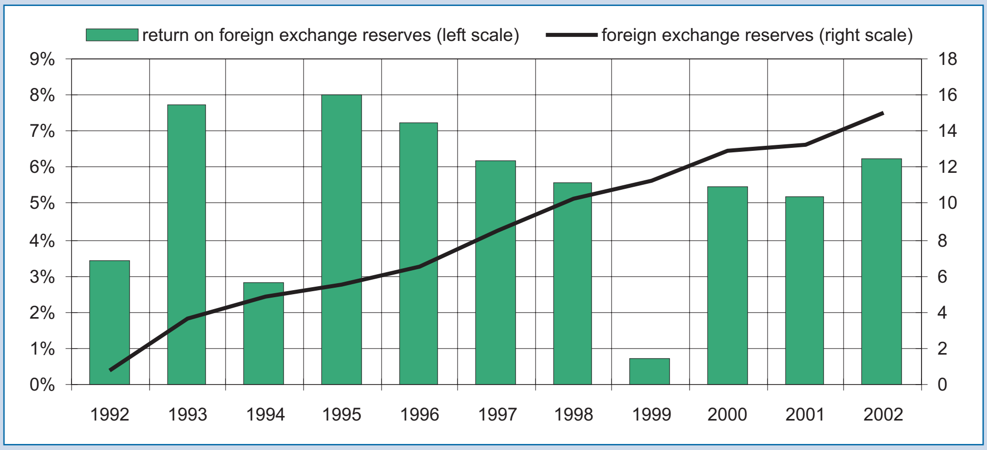

Figure 8.7. Volume (EEK m) and return on foreign exchange reserves

The foreign exchange reserves of Eesti Pank were created on 31 March 1992 when the Bank of England returned the gold Estonia had deposited there before World War II. By September 1992 various financial institutions of the world returned a total of 11.356 tonnes of gold to Estonia, the bulk of which was sold the same year. Today, 256 kilograms of gold is still deposited in the vaults of the US Federal Reserve.

In the first years after the restoration of independence the main instruments of reserve management were deposits as the credit limits allocated to Eesti Pank were very small – the bank was little known and therefore had a low credibility rating. Since the summer of 1993, the choice of instruments widened considerably, which enabled more flexible and efficient investments. Among other possibilities, simpler derivative instruments were added. The risk limits and constraints on counterparties originate from the same period.

Risk management in the modern meaning of the term was fully applied to reserve management in 1994. This was mostly related to the purchasing of the relevant software. The fact that today the European Central Bank (and thus all central banks of EU member countries) has introduced the same treasury software has confirmed our correct technological choices back then. In 1994, first steps were also taken in the risk-based management of investments.

In 1995, the biggest change in reserve management was the introduction of the benchmark portfolio as a standard of efficiency. In the same year, the decision-making process of reserve *management was supplemented with the set-up of an investment committee responsible for strategic investment decisions and from there emerged the possibility of using the services of foreign asset management firms. Since then three different external asset managers have been awarded with varying mandates.*

In the summer of 1999, the International Monetary Fund audited the operational environment of Eesti Pank's reserve management and gave it a high assessment. It was noted that the reserve management environment of Eesti Pank was in line with the practices of other central banks and international good practice.

The further development of reserve management has been related to the improvement of investment environment and the decision process, as well as increase in efficiency. This concerns, first of all, constant improvement of risk management and norms and the instruments used. Wider use of derivative instruments has been an important aspect here and the change of external managers' mandate is indirectly related to this. The previous management mandate that practically duplicated the work of reserve management was changed into a risk-based mandate. In 2002, new external managers were hired under the new mandate. The work of Eesti Pank's own reserve management is also becoming risk-based.