

VII. PAYMENT AND SETTLEMENT SYSTEM

Maintaining monetary stability and developing stable and efficient financial sector is part of Eesti Pank's main objectives and reliable payment and settlement system plays an important role in achieving this objective. In order to carry out successful monetary policy, every central bank needs an efficient settlement system for settling payments in the base currency. A modern and efficient settlement system is also needed for guaranteeing the stability and sustainable development of the secure financial sector as well as efficient money circulation in the country. Trust in the monetary system is also increased by the smooth functioning of cash supply.

INTERBANK SETTLEMENT SYSTEM

Since the launch of Eesti Pank's new settlement system on 21 January 2002, interbank payments go through two subsystems – Real Time Gross Settlement System and Designated Time Net Settlement System.

The Real Time Gross Settlement System (RTGS) is meant for processing high-value and urgent payments. Payments from one bank to another take just a few minutes. All payments worth 15 million kroons and more are considered high-value payments and processed through the RTGS. However, smaller payments can be settled through this system as well.

The Designated Time Net Settlement System (DNS) is meant for payments below 15 million kroons. Payments are transmitted to the DNS in batches of credit orders. In the DNS, multilateral nettings are continuous but received payment orders are transferred to banks three times a day. This guarantees that payments from one bank to another take no more than a few hours.

In its structure, the interbank settlement system fully meets international requirements and good practices. The implementation of the new system has allowed commercial banks to widen the choice of services provided to clients and it enables more flexible liquidity management. For bank clients, the new system primarily means faster movement of payments between banks.

Although both sub-systems have operated successfully for more than a year, the **development of the system** will continue also in 2003. The key words here are preparations for joining the Trans-European Automated Real-time Gross Settlement Express Transfer system TARGET and technical standardisation of the settlement system, including the implementation of the International Bank Account Number standard (IBAN).

Amendment of Legislation Concerning Payment and Settlement Systems

Legal policy of Eesti Pank in the field of payment and settlement systems proceeds from the principle of distancing from regulating the legal relations between credit institutions and their clients. So far the central bank has had to deal with it only because the rights of the client – the weaker side in this relationship – had not been sufficiently protected by the law. The central bank has also tried to further the creation of a general and unified notification standard for the clients of credit institutions.

The Law of Obligations Act that entered into force in 2002 protects the rights of clients of credit institutions and therefore changes were made in the rules of payments, first of all, in regulations concerning settlement deadlines for payment. Thus, **from 1 July 2002, the settlement deadline and penalties for late payments are regulated by the Law of Obligations Act.**

The recommendation for compiling the account statement, introduced on 1 March 2003, was worked out in cooperation with the commercial banks and was published through the Estonian Banking Association.

As a result of the launch of the new interbank payment and settlement system and development of settlement services provided by banks, **the legal relationships between participants of the interbank settlement system were renewed.** As compared to the former settlement system, the regulation of relationships is more flexible. This means that the decrees of the Governor of Eesti Pank, which regulated the legal relations in the old system, have been replaced with accession contracts between system participants – Eesti Pank and participants of the settlement system. In order to join either the DNS or the RTGS, the commercial bank has to conclude a separate contract, supplemented by general and technical conditions and the price list.

European Central Bank on Estonian Settlement System

In the spring of 2002, a delegation of the European Central Bank (ECB) visited Estonia with the aim of assessing the Estonian settlement system. The objective of the evaluation submitted to the European Commission was to determine whether the settlement system used in Estonia corresponded to international standards and good practices and the requirements set by EU institutions. The ECB carried out similar evaluations also in other EU candidate countries. The overall assessment to the Estonian settlement system was positive. This means that the **settlement subsystems operating in Estonia are sufficiently secure and efficient to allow our credit institutions successfully compete with the banks of other EU member countries.**

DEVELOPMENT OF INTERBANK SETTLEMENT SYSTEM

Pre-monetary reform period – paper-based payment documents

*In the early 1990s, Estonian interbank settlements were carried out through correspondence accounts of banks and their branches at the Settlements Department of the central bank. The whole process was tiresome and time-consuming – payment documents were brought to Eesti Pank on **paper**, then the data was transferred to a punched card or tape and fed into the computer. Account statements were sent to banks on the following day. Settlements with distant branches took days. Eesti Pank provided automatic overdraft facility at the daily interest rate of 0.1%; thus, the banks did not have to pay attention to the state of their accounts. Besides, it*

was advantageous for them as the interest rate on the credit banks issued to companies was even higher.

Post-monetary reform period – preparations for electronic settlements

In the course of preparations for the monetary reform **new settlement rules** were worked out and preparations were made for starting **electronic settlements**. The period from 1 April to 1 October 1992 was a transition period from paper settlements to electronic interbank settlements. During this period the banks equipped with computer communication were gradually linked to the common network. Compared to earlier practices, withdrawals from payer's account without a specific order were limited. Under the new rules, settlements could only be made within the limits of the credit balance of the bank's correspondence account. In order to speed up settlements, it was decided that domestic settlements had to be carried out within 48 hours. While so far branch offices had been treated as separate entities with independent correspondence accounts, then from 1 October the parent bank and its branches were considered as one entity and settlements were carried out within the limits of a general credit balance. This allowed parent banks to control the activity of branch offices and regulate money flows between branches.

Electronic settlements in Eesti Pank net settlement system EPNAS

EPNAS was launched on 1 October 1992. The entire payment information was passed via a modem and payment orders were accepted until 2 pm. After that, the settlement system began the calculation of mutual net claims and liabilities of banks on the basis of the payment orders received. The first interim summary of set-offs was sent to the banks one hour later. From 3 pm to 5 pm banks carried out money market operations and after that the final set-off was carried out. The settlement department was constantly monitoring the balances of the settlement accounts of the banks so that these would not fall below the reserve requirement level.

The 1992 settlement system EPNAS functioned until the launch of the currently used two-part system (DNS and RTGS) in January 2002.

PAYMENT INSTRUMENTS

Non-cash Instruments

The number of **cash payments** continued to decrease in 2002. Cash payments accounted for just 0.8% of all the payments settled through commercial banks and 0.2% of their turnover. Year-on-year, the number of cash payments dropped by nearly one third.

The most widely used non-cash payment instrument in 2002 was **credit order**, comprising 52% of the total number of non-cash payments and 99% of their turnover (see Table 7.1). Instead of the paper-based or telephone banking credit orders, more and more **Internet banking, telebanking** and **standing credit orders**

are used. Year-on-year, the turnover of Internet banking credit orders increased by nearly half and amounted to 138 billion kroons. Internet banking credit orders accounted for 22% of the total number of non-cash payments in 2002. Among other electronic instruments, telebanking credit orders accounted for 25%, standing orders and telephone banking credit orders for 1% of the total number of non-cash payments.

Table 7.1. Payments by payment instruments in 2002

	Turnover (EEK m)	Number of payments (in thousands)	Average size (EEK thousand)
Cash	3,275.62	735.37	4.5
Non-cash payments	2,076,258.06	85,812.57	24.2
Cheques	270.64	23.93	11.3
o/w travellers cheques	12.46	3.22	3.9
other cheques	258.19	20.71	12.5
Card payments	11,334.66	34,479.76	0.3
Direct debit	2,107.06	6,591.76	0.3
Credit orders	2,055,013.57	44,677.98	46.0
o/w standing orders	14,628.10	1,271.94	11.5
paper-based credit orders	187,507.94	3,134.56	59.8
telebank credit orders	469,141.73	21,033.14	22.3
telephone-bank credit orders	2,281.71	593.40	3.8
Internet-bank credit orders	138,055.48	18,552.02	7.4
SWIFT	1,243,398.61	92.92	13,381.7
Unidentified	7,532.12	39.14	192.5
Total	2,079,533.68	86,547.94	24.0

¹ From the beginning of 2002 direct debits were recorded more precisely.

Among the debit instruments, the share of payments with the **bank card** and **direct debit** increased considerably in 2002. The payments made with these two types of debit instruments accounted for 40 and 8%, respectively, of the total number of non-cash payments. Year-on-year, the number of bank card payments increased by more than 47% and the turnover was up 29%, amounting to 11.3 billion kroons. The use of direct debit increased by one third and reached 6.6 million payments in 2002.

Compared to 1998, the number of payments nearly tripled and the turnover more than doubled in 2002 (see Figure 7.1). In five years, the number of payments made by direct debit has increased the most – by 65 times.

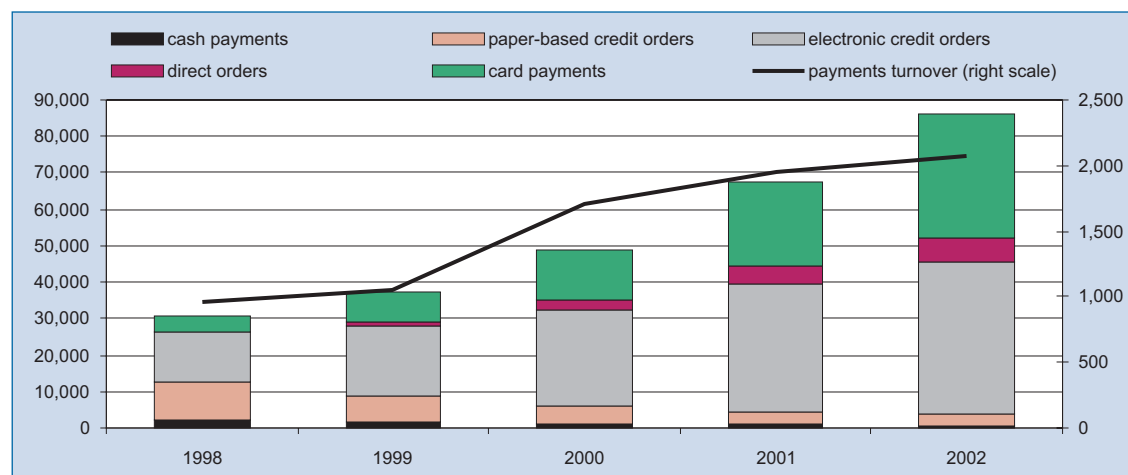


Figure 7.1. Number of payments (in thousands) and turnover (EEK bn, right scale) by payment instruments

With cash payments and paper-based credit orders decreasing, the use of electronic payment instruments (electronic orders and bank cards) has been constantly increasing. While the number of cash payments and paper-based credit orders decreased more than three times last year, the number of electronic (Internet banking, telebanking and SWIFT) credit orders and card payments increased by more than three and 7.5 times, respectively.

By the end of 2002, Estonian credit institutions had issued more than 1.1 million **bank cards**, 18% of which were passive, ie no payments were made with these (see Table 7.2). We had 0.82 bank cards per capita, including 0.72 debit cards and 0.11 credit cards per capita. In 2002, more than 87,000 **debit cards** and nearly 45,000 **credit cards** were issued. While at the end of 2001 credit cards accounted for 11% of the total number of bank cards issued, then at the end of 2002 their share had increased to 14%. Bank cards meant for local use only accounted for just 0.8% of the total number of bank cards.

Table 7.2. Total amount of bank cards issued in Estonia (in thousands)

	1998	1999	2000	2001	2002
Domestic debit cards	292.3	59.5	13.4	8.8	8.8
o/w cash cards	50.9	15.1	4.5	4.9	7.5
debit cards	241.5	44.3	9.0	3.9	1.3
International debit cards	386.1	690.0	801.7	868.2	955.7
Debit cards total	678.5	749.5	815.1	877.0	964.5
Credit cards total	19.2	21.3	43.3	110.1	155.1
Debit and credit cards total	697.6	770.8	858.4	987.2	1,119.6

Along with the growth in the number of bank cards, the possibilities for their use have also increased. In 2002, the number of **automated teller machines (ATMs)** increased by 39 and 2,093 new **points of sale (POS) with a bank card payment facility** were added, bringing their respective numbers to 719 and 7,353 (see Table 7.3). Nearly 89% of ATMs accept most widespread international bank cards issued in any country of the world.

Table 7.3. Number of ATMs and POS accepting bank cards

	1998	1999	2000	2001	2002
ATMs total	490	591	630	680	719
o/w cross-usage ATMs	433	530	564	600	638
ATMs accepting cash payments	8	9	10	10	6
Cash dispensers	307	203	203	210	252
Cash and payment dispensers	126	327	361	390	386
Payment dispensers	57	61	66	80	81
POS accepting bank cards	2,586	3,267	4,084	5,260	7,353

Compared to 1995 when Estonian banks began to issue international bank cards, the number of cards had increased by nearly ten times by the end of 2002. The number of domestic bank cards has decreased, while the number of international debit cards has increased by more than hundred times and the number of international credit cards by nearly 70 times. By the end of 2002, the number of ATMs exceeded the respective 1995 figure five times and the number of points of sale with a bank card payment facility had increased by nearly 30 times.

Settlements

The Designated Time Net Settlement System of Eesti Pank settled an average of 56,000 payments per day in 2002 and the average daily turnover was 605 million kroons (see Figure 7.2). As high-value and

urgent payments were settled in the gross settlement system, the turnover of payments in the net settlement system decreased year-on-year, although their number increased by 20%.

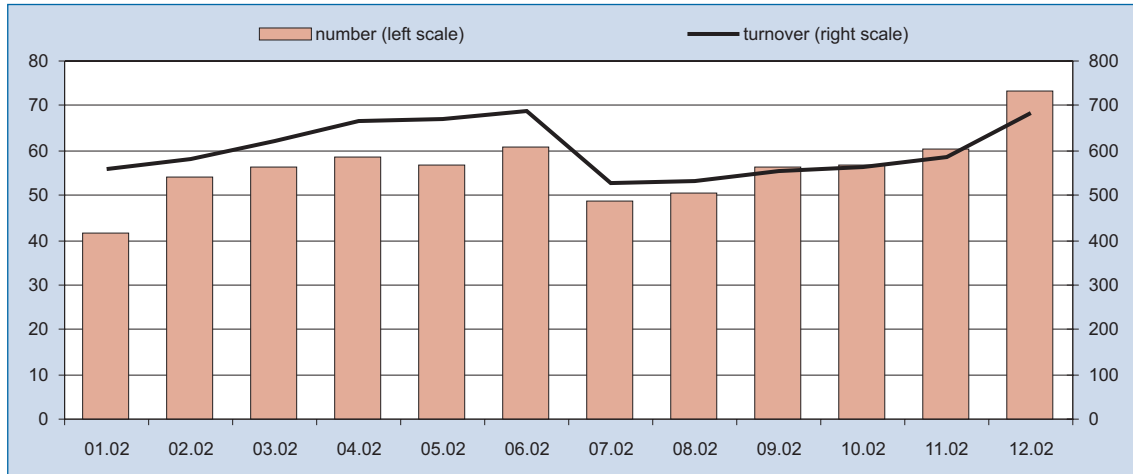


Figure 7.2. Daily average number (in thousands) and turnover (EEK m) of payments settled in the Designated Time Net Settlement System in 2002

The Real Time Gross Settlement System handled an average of 66 payments per day in 2002, with the total turnover of 2.1 billion kroons (see Figure 7.3). It is worth noting that client payments accounted for 55% of all payments in the second half of 2002 and the share of client payments is constantly increasing. This indicates that bank clients have quickly accepted interbank urgent payments.

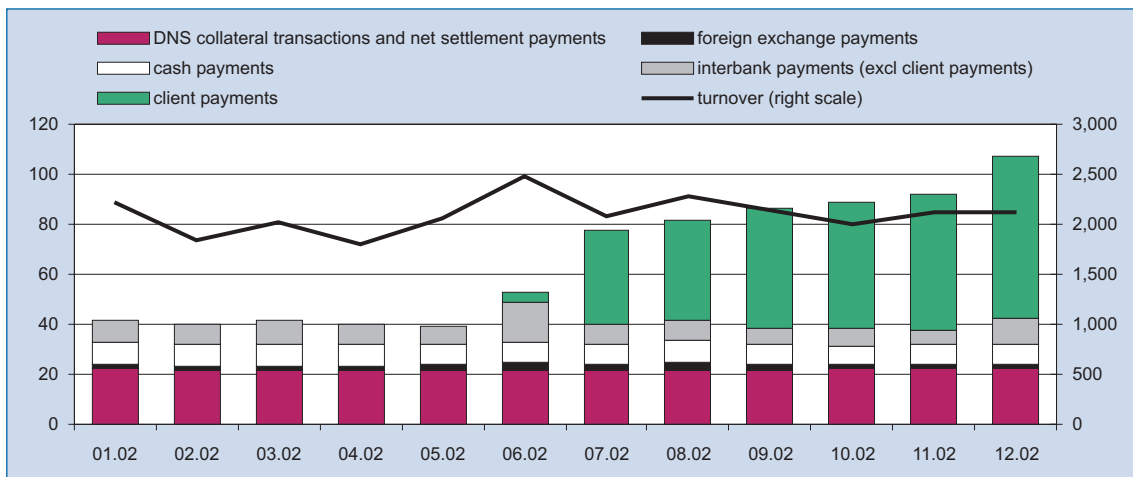


Figure 7.3. Daily average number by type (in thousands) and turnover (EEK m) of payments handled in The Real Time Gross Settlement System in 2002

The year-on-year growth of the number of payments and turnover in the settlement system of Eesti Pank can be attributed to the so-called mandatory payments of the new subsystems – 60% of the turnover of the RTGS payments consists of the net settlement system collateral payments.

Meeting the Cash Demand

Issued Banknotes and Coins and Their Structure

As of 31 December 2002, the total amount of cash in circulation was slightly up year-on-year, reaching 8,113 million kroons. 13.8% of this or 1,117.5 million kroons was in the vaults of Estonian credit institutions, 0.6 million kroons in the safes of the savings and loan associations and 6,994.9 million kroons or 86.2% in the circulation outside these two.

Unlike in 2001, the seasonal increase in the amount of cash in circulation was relatively small in the summer and end of 2002. As a result, the amount of cash in circulation at the end of 2002 was up just 46.5 million kroons year-on-year.

There were no major changes in the structure of cash in circulation in 2002 (see Table 7.4). The amount of 25- and 2kroon banknotes in circulation increased the most. The latter are partly replacing the 1kroon banknotes, which are no longer issued. As the seasonal increase of the total sum of cash in circulation was small, the sum of 500kroon banknotes also increased only modestly as compared to 2001 (the seasonal increase is mostly covered by the 500kroon banknotes).

Table 7.4. Banknotes and coins in circulation

Denomination	By sum (EEK m) as of				Million pieces as of			
	31.12.99	31.12.00	31.12.01	31.12.02	31.12.99	31.12.00	31.12.01	31.12.02
1kroon notes	7.5	5.8	5.1	4.8	7.5	5.8	5.1	4.8
2kroon notes	16.6	18.9	20.7	22.3	8.3	9.4	10.3	11.1
5kroon notes	30.9	33.0	34.1	35.6	6.2	6.6	6.8	7.1
10kroon notes	61.3	62.5	63.6	65.1	6.1	6.3	6.4	6.5
25kroon notes	144.3	154.9	162.0	174.7	5.8	6.2	6.5	7.0
50kroon notes	61.7	57.0	51.1	51.5	1.2	1.1	1.0	1.0
100kroon notes	1,082.9	1,055.8	1,065.9	1,020.9	10.8	10.6	10.7	10.2
500kroon notes	5,185.9	5,818.2	6,583.6	6,648.3	10.4	11.6	13.2	13.3
Banknotes total	6,591.1	7,206.2	7,986.0	8,023.1	56.3	57.6	59.9	61.1
5sent coins	2.2	2.2	2.2	2.2	43.6	43.5	43.1	43.1
10sent coins	7.7	8.3	9.0	9.7	77.0	83.5	89.6	97.0
20sent coins	11.0	12.0	13.1	14.6	54.9	60.0	65.7	72.9
50sent coins	9.3	10.4	11.5	12.9	18.7	20.7	23.0	25.9
1kroon coins	14.1	25.0	31.8	37.3	14.1	25.0	31.8	37.3
5kroon coins	8.6	8.2	7.9	7.8	1.7	1.6	1.6	1.6
Circulation coins total	52.9	66.1	75.5	84.5	210.1	234.4	254.7	277.8
Commemorative coins	4.8	5.0	5.0	5.3	0.1	0.1	0.1	0.1
Sum total	6,648.8	7,277.3	8,066.5	8,113.0	x	x	x	x

Although the number of coins in circulation is constantly increasing (except for 5kroon coins), they account for only ca 1% of the total cash in circulation.

Due to the increase in the share of 2- and 25kroon banknotes and the decrease of the share of 100kroon banknotes, the average value of a banknote in circulation fell by 2.1 kroons year-on-year and amounted to 131.3 kroons at the end of 2002. The average value of a coin in circulation was 30.4 sents or 0.5 sents higher than in 2001. This can be attributed to the increase in the number of 1kroon coins in circulation.

Cash Circulation

The movement of cash between Eesti Pank and credit institutions is characterised by Table 7.5. Compared to the two previous years, a considerable decrease took place in the amount of cash issued from Eesti Pank

to credit institutions and the amount of cash returned to Eesti Pank. As the share of banknotes with small denomination increased in the structure of issued and returned cash, the number of banknotes decreased less than their total sum. The turnover of coins between the central bank and credit institutions continued to increase in 2002.

Table 7.5. Movement of cash between Eesti Pank and credit institutions

	By sum (EEK m)		Million pieces			
	Issued from Eesti Pank	Received by Eesti Pank	Issued from Eesti Pank		Received by Eesti Pank	
			banknotes	coins	banknotes	coins
1999	8,245.8	6,986.5	61.6	28.3	60.7	1.2
2000	11,655.1	11,025.1	83.3	24.7	82.1	0.2
2001	14,627.1	13,836.2	104.4	21.9	101.8	1.5
2002	9,849.7	9,799.4	95.1	24.8	93.9	1.8

The change in the structure of the cash turnover between Eesti Pank and credit institutions was expressed also in the change of **circulation speed of the banknotes**. Compared to 2001, the circulation of larger denominations (100- and 500kroon banknotes) became slower, while banknotes of smaller denomination were returned to the central bank in a shorter period than before. As we can see from Table 7.6, 25kroon banknotes have the highest circulation speed – on average, the 25kroon banknotes in circulation at the beginning of 2002 were returned to Eesti Pank in 3.1 months. 2- and 500kroon banknotes had the longest circulation period – nearly a year.

Table 7.6. Circulation speed of banknotes between Eesti Pank and credit institutions

Denomination	Circulation speed (in months)			
	1999	2000	2001	2002
2kroon notes	15.8	12.5	11.7	11.0
5kroon notes	15.7	11.9	9.6	8.6
10kroon notes	14.6	10.1	8.4	7.4
25kroon notes	6.3	4.8	3.5	3.1
50kroon notes	8.6	8.0	7.2	7.2
100kroon notes	5.9	4.8	4.1	5.7
500kroon notes	10.9	8.0	7.0	11.8

All banknotes returned to Eesti Pank are sorted. Worn-out banknotes are destroyed and the rest are returned to circulation. In 2002, 20.1 million banknotes with the total value of 1,343.4 million kroons were withdrawn from circulation (see Table 7.7). Less cash was destroyed at the central bank than in 2001.

Table 7.7. Worn-out banknotes withdrawn from circulation

Denomination	By sum (EEK m)				Million pieces			
	1999	2000	2001	2002	1999	2000	2001	2002
1kroon notes	4.9	1.5	1.0	0.4	4.9	1.5	1.0	0.4
2kroon notes	7.7	9.2	9.0	6.2	3.9	4.6	4.5	3.1
5kroon notes	22.3	27.5	22.0	16.9	4.5	5.5	4.4	3.4
10kroon notes	43.4	29.7	17.2	28.8	4.3	3.0	1.7	2.9
25kroon notes	117.1	77.1	21.1	109.9	4.7	3.1	0.8	4.4
50kroon notes	56.4	34.6	51.1	27.5	1.1	0.7	1.0	0.6
100kroon notes	845.5	567.8	627.9	383.3	8.5	5.7	6.3	3.8
500kroon notes	1,100.1	739.2	1,314.5	770.4	2.2	1.5	2.6	1.5
Total	2,197.4	1,486.7	2,063.8	1,343.4	34.0	25.5	22.4	20.1

EESTI PANK'S CASH AND SECURITY DEPARTMENT'S MANAGEMENT SYSTEM CORRESPONDS TO ISO 9001:2000 QUALITY STANDARD

In 2002, Bureau Veritas Quality International issued Eesti Pank a certificate which testifies that the quality management system of Eesti Pank's Cash and Security Department corresponds to the requirements of ISO 9001:2000 quality standard.

The quality certificate covers cash management and cash operations, including:

- *issuing of cash;*
- *maintaining of cash reserves;*
- *handling of banknotes and coins;*
- *safeguarding cash reserves;*
- *ensuring cash circulation.*

The ISO 9001:2000 quality standard represents the process-centred approach, which means that work processes and their mutual influences are clearly defined, efficiently implemented and managed in the organisation that has been granted the quality certificate. The quality standard issued to Eesti Pank indicates that these processes correspond to international requirements and their efficient and secure functioning in meeting the cash demand of Estonian society is guaranteed.

Introduction of New Banknotes and Expert Analysis of Cash

In 2002, **25kroon banknotes with renewed design and new security features** were issued under the technical specification worked out by Eesti Pank. The new banknotes were designed by Vladimir Taiger and they were printed at Giesecke & Devrient GmbH in Germany. The issue of this banknote completed the designing of the new generation of large-denomination banknotes (except the 50kroon note). In recent years, new versions of 25-, 100- and 500kroon banknotes have been put into circulation. The banknotes of earlier version will be withdrawn from circulation in accordance with their wear.

In 2002, Eesti Pank marked the 10th anniversary of the reintroduction of the kroon with issuing the **100kroon pure gold (Au 999.9) commemorative coin**. By this the central bank perpetuated the significant role of the kroon and the Estonian monetary system as a whole in the development of our country over the last decade. The gold coin was designed by Tiit Jürna and it was struck by Münze Österreich in Austria.

A commemorative pure silver (Ag 999) coin dedicated to the University of Tartu was also issued in 2002. An innovation which has so far never been used for PROOF-quality coins was applied in the production of this coin – the computer file with the design of the coin's reverse side was electronically sent to the mint's engraving bench and the time-consuming stages of traditional modelling and reduction were skipped in producing the coining die. The obverse of the coin, designed by Arseni Mölder in 1992, features the large coat of arms of the Republic of Estonia. The main element of the reverse of the coin is the façade of the main building of the University of Tartu in a polished ellipse. The reverse side was designed by Tiit Kirsipuu. The coin was struck at the Royal Australian Mint.

The money laboratory of the central bank conducted expert analysis of 2,114 worn-out and damaged Estonian banknotes in 2002, to determine the causes of damage; also 159 counterfeited Estonian banknotes were examined. At the request of commercial banks, the authenticity of Austrian, British, Canadian, Dutch, EU, Finnish, French, German, Latvian, Lithuanian, Norwegian, Polish, Spanish, Swedish and US banknotes was checked and expert opinion expressed. A total of 410 banknotes were examined, of which 331 proved to be forgeries.

TEN YEARS OF ESTONIAN BANKNOTES AND COINS

The Estonian kroons put into circulation ten years ago, in June 1992, have been one of the symbols of Estonian independence and they have been accepted by the Estonian people.

Over the past decade, the sum of Estonian kroons in circulation has increased by 6.6 times – from 1,228.6 million kroons at the end of 1992 to 8,113 million kroons at the end of 2002. The growth has been considerably slowed down by the faster development of other payment instruments. As growth has mostly occurred on the account of 500kroon notes, the number of banknotes in circulation has increased just from 54.2 million to 61.1 million. However, the number of coins in circulation has increased considerably.

As the amount of cash in circulation has been constantly increasing and the central bank also has to replace worn-out banknotes, Eesti Pank has ordered new banknotes and coins all the time. The underbiddings organised in recent years have kept the cost price of new cash relatively low without lowering the quality requirements. On the contrary – the new versions of banknotes are beautiful and technically perfect. This has also been noticed by international experts. Due to the increasing security level of Estonian banknotes, counterfeiting has not become a problem.

Although issuing commemorative coins is not the main task of Eesti Pank, several different coins have been issued in ten years. The 500kroon gold coin dedicated to the 80th anniversary of the Republic of Estonia and the 100- and 10kroon silver coins are particularly popular among collectors, as well as the 100kroon gold coin dedicated to the 10th anniversary of the reintroduction of the Estonian kroon.

Sorting of cash has been fully transformed at the central bank over the past ten years. While at the beginning banknotes were sorted manually, then now this is done by an automatic sorting machine. Security and efficiency of cash storage and handling is also guaranteed by constant organisational improvement, which has been acknowledged by the ISO 9001:2000 quality certificate issued to Eesti Pank.