

VII. PAYMENT SYSTEMS AND INSTRUMENTS

The efficiency of a country's financial system depends on the smooth functioning of its payment systems¹, since every financial transaction is carried out using a payment system. **A smoothly functioning financial system is characterized by stability, efficient monetary policy, and smooth currency circulation**, which in turn guarantee price stability through the reliability of the monetary system and the national currency. Various types of payment systems have to correspond to the existing legal framework, and no faults that could jeopardize the financial system are allowed in their functioning.

On the European Union level, the issues related to payment systems are discussed in the committees and working groups of the European Central Bank and the EU. Representatives of Eesti Pank have participated in their work since 2003.

The ECB's **Payments and Settlement Systems Committee** (PSSC) is focused on furthering the development of the systems and elaborating the respective strategies. The Committee has five working groups that deal with the following issues:

- developing payment systems related policy;
- issues of securities settlement systems;
- coordination of decisions related to the Trans-European Automated Real-time Gross Settlement Express Transfer System (TARGET);
- creation of a new pan-European settlement system TARGET 2;
- finding a suitable way, a fallback solution for the accession countries to join TARGET, provided TARGET 2 has not yet been developed by the time the new members join the Economic and Monetary Union.

The **Payment Systems Government Expert Group** (PSGEG) works at the European Commission and analyses the impact of payment systems related legal acts which are being drafted or already implemented by the Commission.

¹ Payment systems refer to the infrastructure and its regulatory legal framework, i.e. the environment that enables businesses and individuals to handle their financial obligations.

PAYMENT SYSTEMS OVERSIGHT

In their role as overseers of payment systems the central banks have to guarantee full conformity of the managed settlement systems with international standards and good practices². Oversight covers the payment instruments used in a country and important settlement systems managed by the private sector.

Although the procedures related to payment systems oversight vary slightly across countries, the following issues are usually tackled:

- assessment of the security of different payment systems and their correspondence to market needs;
- analysis of various payment systems related risks;
- specification of payment systems systemically important for the country's sustainable development;
- assessment of the conformity of systemically important payment systems to international standards and good practices.

The ECB has decided to work out a common approach for all EU Member States in this area.

Assessment of EU Acceding and Candidate Countries' Securities Settlement Systems

In 2003, the ECB in cooperation with the NCBs of the acceding and candidate countries assessed the securities settlement systems of these countries. The objective was to help identify the parts of the system that need more attention.

The assessment was based on international standards³, which securities settlement systems suitable for carrying out credit operations in the Eurosystem have to comply with. These standards form a framework for credit operations and risk hedging related to collaterals.

The assessment was carried out mostly for the securities settlement systems used by the NCBs for collateralised central bank operations or systems the NCBs plan to use for credit operations in the Eurosystem. Eesti Pank does not use the local securities settlement system for collateralised central bank operations, but offers commercial banks an opportunity to get liquidity assistance by selling high-quality foreign securities to the central bank through the international securities settlement systems Euroclear and Clearstream. Since no collateral assets eligible for credit operations in the Eurosystem are expected to emerge in the local market in the near future, Eesti Pank intends to use the same procedure also after joining the European System of Central Banks. **Therefore, Eesti Pank has decided that for Estonia the systems to be assessed are the international securities systems Euroclear and Clearstream.** Since these systems, which are settlement systems of the present EMU members, had already been assessed by the ECB, a simplified assessment was carried out, focusing on the risks involved in using these settlement systems by Eesti Pank.

Additionally, the central bank found it necessary to carry out an assessment of the securities settlement system managed by the Estonian Central Depository for Securities in order to get advice on further development of the local system. As the local securities settlement system is not used for central bank operations, the implementation of these recommendations will be left upon the Depository, which manages the system.

As a result of the assessment it was noted that the infrastructure of several acceding and candidate countries can be considered relatively adequate and **almost all of the 21 systems studied** (including Eesti Pank's

² Core Principles for Systemically Important Payment Systems. Information on these requirements is available on the website of the Bank for International Settlements: <http://www.bis.org/publ/cpss34e.pdf>.

³ Standards for the use of EU securities settlement systems in ESCB credit operations. Information on these standards is available on the ECB website at <http://www.ecb.int/emi/pub/pdf/ssstandards1998.pdf>.

solution which covers the use of international securities settlement systems and the local Estonian system) **can be seen as suitable for Eurosystem credit operations.**

The opportunity of selling securities through international securities settlement systems, which Eesti Pank offers to banks, was seen as generally corresponding to standards, despite the fact that the current system is set up to meet today's needs and **in its present state cannot be regarded an intraday liquidity instrument as defined by the European System of Central Banks.** The existing framework does offer liquidity to banks, but this is done in the form of selling foreign assets, and therefore provides no repayment of credits to Eesti Pank and no return of securities by the central bank. Thus, the present solution needs some changes in the near future⁴.

The following recommendations were given for improving the Estonian local securities settlement system:

- System manager has to assess system-related risks according to the Bank for International Settlements guidelines⁵ and make the assessment results available to the public.
- Rules have to be worked out for the use of the guarantee fund of stock exchange transactions.
- Intraday finality of settlement has to be introduced.

Tasks of Eesti Pank in Overseeing Payment Systems

Like most other central banks, Eesti Pank has specified the activities that cover oversight of the payment systems used in Estonia. These include:

- monitoring the use of different payment systems and their correspondence to market needs;
- monitoring and, if necessary, guiding the development of the respective systems;
- specifying important and systemically important settlement systems.

Oversight of systemically important settlement systems includes also the following aspects:

- checking the existence of written procedures on the systems performance and the clarity of these procedures;
- checking adherence to the written procedures on the systems performance;
- checking the existence of a contingency plan in the case of disruptions to a settlement system;
- assessment of the systems' correspondence to international standards and good practices (including risk assessment).

According to Eesti Pank's framework of overseeing payment systems, the central bank assessed the interbank payment system operated by the bank at the end of 2003, based on international standards and good practices. The assessment showed **the legal framework of the interbank payment system, its functional and technical solution and procedures to be safe and up-to-date.** Risk assessment is based on internationally recognized principles and good practices, with the aim of minimizing systemic risk. As a shortcoming it was pointed out that the rules of access to the system have to be improved and made available to the public.

SETTLEMENT SYSTEM OF INTERBANK PAYMENTS

The settlement system of interbank payments managed by Eesti Pank consists of two subsystems – **Real Time Gross Settlement System (RTGS)** and **Designated Time Net Settlement System (DNS).**

The RTGS System is used for high-value (over 15 million kroons) and urgent payments, and it settles payments initiated by both banks and their customers, payments related to the central bank as well as

⁴ See the Strategic Development Plan of Eesti Pank for 2004–2006, I, 4.

⁵ Disclosure Framework for Securities Settlement Systems.

payments initiated by managers of the net settlement systems. In 2003, the RTGS System processed an average of 113 payments a day (see Figure 7.1). Year-on-year, the number of payments increased by 69%. This resulted from the growing number of customer payments, since the average daily number of customer-initiated payments amounted to 74, and they accounted for 66% of the payments settled through the RTGS System. The average size of customer payments was 2.9 million kroons in 2003.

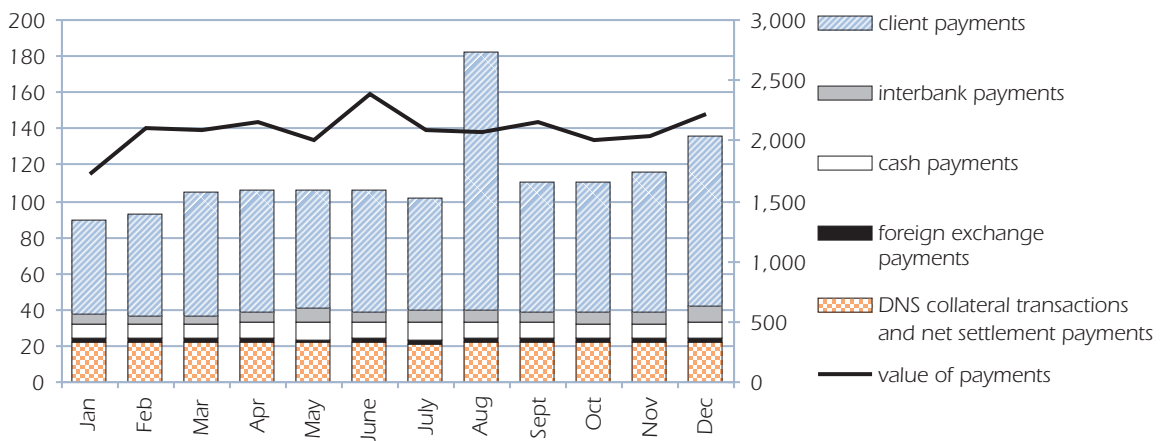


Figure 7.1. Average daily number by type (left scale) and value (EEK million, right scale) of payments processed in the RTGS in 2003

The average daily value of the RTGS System in 2003 was similar to that of 2002 – 2.1 billion kroons. The bulk (63%) of the RTGS turnover was made up of payments related to the DNS System collateral payments, i.e. daily payments by the DNS System participants in order to participate in the system.

In the DNS System, which is meant for processing retail payments, multilateral net settlement between system participants takes place continuously but the incoming payment orders are sent to the receiver bank three times a day (at 11.00 a.m., 2.00 p.m., and 4.00 p.m.). In 2003, an average of 65,000 payments were settled every day and the average daily value amounted to 618 million kroons (see Figure 7.2). Since 2002 the number of payments has increased by 14% and the value by 2%. The average size of payments settled in the DNS System was 9,500 kroons in 2003, i.e. 12% less than in 2002.

Estonia's accession to the EU and the subsequent accession to the Economic and Monetary Union leads to the need to develop the interbank payment system in order to join the trans-European settlement system

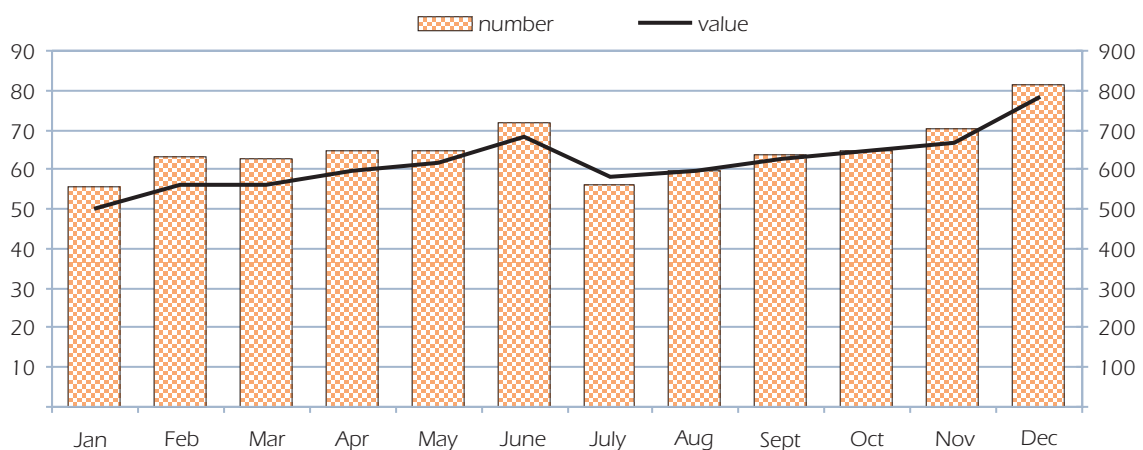


Figure 7.2. Average daily number (thousands, left scale) and value (EEK million, right scale) of payments processed in the DNS System in 2003

TARGET. This task has been included in the Strategic Development Plan of Eesti Pank⁶, and achieving this goal will guarantee the necessary infrastructure for monetary policy operations and enable to perform international payments efficiently and safely. **The year 2003 has thus been the first year of preparations for joining TARGET and has involved establishing the Estonian international bank account number (IBAN)**⁷. IBAN was introduced on 1 January 2004. IBAN concerns all persons dealing with international payments, since the existence of an international bank account number makes payments move faster and IBAN also creates prerequisites for lowering service fees on international payments.

In cooperation with banks and accounting software developers, an electronic format of the bank statement was worked out in 2003, which will make it easier for businesses to enter bank account information into their own information systems.

PAYMENT INSTRUMENTS

Similarly to previous years, the number and value of cash payments continued to decrease in 2003. Cash payments accounted for just 0.6% of the number of payments made via banks and 0.1% of the value. Year-on-year, the number of cash payments dropped by a fifth. This tendency is in line with the goal set in the Strategic Development Plan of Eesti Pank⁸.

In 2003, **credit order** was the most popular non-cash payment instrument, accounting for 47% of the total number and 99% of the value of non-cash payments (see Table 7.1). Instead of paper-based credit orders and telephone banking credit orders, the use of more convenient **Internet banking** and **standing orders** is on the increase. In addition to private individuals, Internet banking services are more and more used by small and medium-sized businesses, thus the use of **telebanking credit orders**, which have dominated for years, has not increased, and their share in the total number of non-cash payments has dropped below 20%.

Table 7.1. Payments by payment instruments in 2003

	Value (EEK million)	Number of payments (thousands)	Average size (EEK thousand)
Cash	2,967.68	585.86	5.1
Non-cash payments	2,130,650.75	105,559.22	20.2
Cheques	213.53	26.78	8.0
o/w travellers cheques	7.35	1.88	3.9
other cheques	206.18	24.90	8.3
Card payments	12,582.19	46,900.87	0.3
Direct debits	2,931.99	8,573.29	0.3
Credit orders	2,111,106.93	50,045.84	42.2
o/w standing orders	16,675.95	1,383.16	12.1
paper-based credit orders	221,451.10	2,547.26	86.9
telebanking credit orders	481,007.48	21,013.29	22.9
telephone banking credit orders	1,409.69	542.04	2.6
Internet banking credit orders	210,814.30	24,453.90	8.6
SWIFT	1,179,748.42	106.21	11,108.1
Unidentified	3,816.12	12.44	306.8
Total	2,133,618.43	106,145.08	20.1

⁶ See the Strategic Development Plan of Eesti Pank for 2004–2006, II, 10.

⁷ Information on IBAN is available on the website of the Estonian Banking Association at <http://www.pangaliit.ee/iban.htm>

⁸ See the Strategic Development Plan of Eesti Pank for 2004–2006, III, 11.

Compared to 2002, the value of Internet banking credit orders increased by more than 50%, amounting to 211 billion kroons. Internet banking credit orders accounted for 23% of the number of non-cash payments in 2003. Standing orders and telephone banking credit orders both accounted for approximately 1% of the total number of non-cash payments.

Among the debit instruments, the share of **card payments** and payments initiated by **direct debit** continued to increase. The payments made by these two instruments accounted for 44% and 8% respectively, of the total number of non-cash payments. Year-on-year, the number of card payments increased more than 38%, and their value nearly 17%, amounting to 12.6 billion kroons. The use of direct debit increased by one third, i.e. the number of payments reached 8.5 million in 2003.

Compared to 1998, the number of payments grew by nearly 3.5 times in 2003 and the value more than doubled (see Figure 7.3). **In six years, the number of payments made by direct debit has increased the most – 85 times.** With cash payments and paper-based credit orders decreasing, the use of electronic payment instruments (electronic credit orders and bank cards) has been constantly increasing. While the number of cash payments and paper-based credit orders has decreased four times over the past six years, the number of electronic credit orders (Internet banking, telebanking, SWIFT, and standing orders) has increased by nearly 3.5 times and the number of card payments has grown by more than 10.5 times.

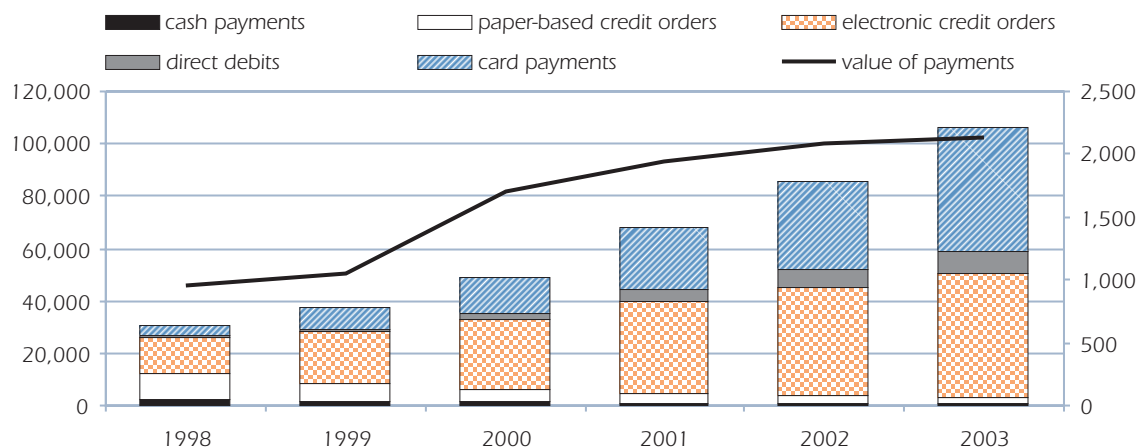


Figure 7.3. Number (thousands, left scale) and value (EEK billion, right scale) of payments by payment instruments

By the end of 2003, Estonian credit institutions had issued nearly 1.2 million **bank cards**, 17% of which were passive, i.e. they were not used for payment (see Table 7.2). In 2003, more than 47,000 **debit cards** and over 31,000 **credit cards** were issued. By the end of 2003, there were 0.89 bank cards per capita in Estonia,

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

	1998	1999	2000	2001	2002	2003
Domestic debit cards	292.3	59.5	13.4	8.8	8.8	8.5
o/w cash cards	50.9	15.1	4.5	4.9	7.5	8.3
debit cards	241.5	44.3	9.0	3.9	1.3	0.2
International debit cards	386.1	690.0	801.7	868.2	955.7	1 003.2
Debit cards total	678.5	749.5	815.1	877.0	964.5	1,011.6
International credit cards	19.2	21.3	43.3	110.1	155.1	186.3
Credit cards total	19.2	21.3	43.3	110.1	155.1	186.3
Credit cards total	697.6	770.8	858.4	987.2	1,119.6	1,197.9

including 0.75 debit cards and 0.14 credit cards respectively. Like in previous years, the share of credit cards among bank cards issued by the Estonian credit institutions continued to grow and reached 16% at the end of the year. Bank cards meant for local use accounted for just 0.8% of the total number of bank cards.

Along with the growth in the number of bank cards, the possibilities for their use also increased in 2003. The number of **automated teller machines (ATMs)** increased by 28, and 1,831 new **point-of-sale (POS) terminals** were established, raising their respective numbers to 747 and 9,184 (see Table 7.3). Over 86% of ATMs accept most widespread international bank cards issued by credit institutions worldwide.

Table 7.3. Number of automated teller machines and point-of-sale terminals

	1998	1999	2000	2001	2002	2003
Automated teller machines total	490	591	630	680	719	747
o/w cross-usage ATMs	433	530	564	600	638	646
ATMs accepting cash payments	8	9	10	10	6	6
Cash dispensers	307	203	203	210	252	271
Cash withdrawal and payment terminals	126	327	361	390	386	375
Payment terminals	57	61	66	80	81	101
Point-of-sale terminals	2,586	3,267	4,084	5,260	7,353	9,184

Compared to 1995 when Estonian banks began issuing international bank cards, the number of cards had increased tenfold by the end of 2003. The number of bank cards for domestic use only has decreased, while the number of international debit cards has increased by more than 110 times and the number of international credit cards by over 80 times. At the end of 2003, the number of ATMs exceeded the respective 1995 figure five times and the number of POS terminals was up by nearly 37 times.

MEETING THE CASH DEMAND

Issued Banknotes and Coins and Their Structure

The total amount of cash in circulation as at 31 December 2003 was 8,324.1 million kroons. 14.2% of cash in circulation, i.e. 1,184.4 million kroons was in the vaults of Estonian credit institutions and savings and loan associations, and 7,139.7 million kroons, i.e. 85.8% in the circulation outside these two.

In the past two years, the amount of cash in circulation has increased relatively slowly – by 0.6% in 2002 and 2.6% in 2003. This can be attributed to the faster growth of non-cash payment instruments. Similarly to 2002, the structure of cash in circulation changed little in 2003 (see Table 7.4). The amount of all banknotes increased slightly, with the exception of 50-kroon notes, which have a relatively low demand, and 1-kroon notes, which are no longer issued.

The number of coins in circulation exceeded 300 million, which brings the per capita number of coins to over 220. The number of 5-kroon coins decreased as people prefer 5-kroon banknotes instead, and the number of 5-sent coins fell as well since these are no longer issued.

The average value of a banknote in circulation changed little over the year (down by 0.9 kroons) and stood at 130.4 kroons at the end of 2003. The average value of a coin in circulation was 30.7 sents, i.e. 0.3 sents higher than in 2002. This can be attributed an increase in the number of 1-kroon coins in circulation.

Table 7.4. Banknotes and coins in circulation

Denomination	Value (EEK million)				Number (millions)			
	31.12.00	31.12.01	31.12.02	31.12.03	31.12.00	31.12.01	31.12.02	31.12.03
1-kroon notes	5.8	5.1	4.8	4.7	5.8	5.1	4.8	4.7
2-kroon notes	18.9	20.7	22.3	23.9	9.4	10.3	11.1	11.9
5-kroon notes	33.0	34.1	35.6	36.7	6.6	6.8	7.1	7.3
10-kroon notes	62.5	63.6	65.1	66.8	6.3	6.4	6.5	6.7
25-kroon notes	154.9	162.0	174.7	179.6	6.2	6.5	7.0	7.2
50-kroon notes	57.0	51.1	51.5	49.5	1.1	1.0	1.0	1.0
100-kroon notes	1,055.8	1,065.9	1,020.9	1,068.6	10.6	10.7	10.2	10.7
500-kroon notes	5,818.2	6,583.6	6,648.3	6,796.8	11.6	13.2	13.3	13.6
Banknotes total	7,206.2	7,986.0	8,023.1	8 226,6	57,6	59,9	61,1	63,1
5-sent coins	2.2	2.2	2.2	2.2	43.5	43.1	43.1	43.0
10-sent coins	8.3	9.0	9.7	10.,5	83.,5	89.,6	97.,0	104.,9
20-sent coins	12.0	13.1	14.,6	16.,2	60.,0	65.,7	72.,9	80.,8
50-sent coins	10.4	11.5	12.9	14.5	20.7	23.0	25.9	29.0
1-kroon coins	25.0	31.8	37.3	41.3	25.0	31.8	37.3	41.3
5-kroon coins	8.2	7.9	7.8	7.6	1.6	1.6	1.6	1.5
Coins total	66.1	75.5	84.5	92.2	234.4	254.7	277.8	300.5
Commemorative coins	5.0	5.0	5.3	5.4	0.1	0.1	0.1	0.1
Total	7,277.3	8,066.5	8,113.0	8,324.1	x	x	x	x

Cash Circulation

In 2003, Eesti Pank issued 8,495.8 million kroons worth of cash to credit institutions and received 8,282.8 million kroons (see Table 7.5). The number of issued banknotes was 88.9 million and the number of coins 23.1 million. 86.8 million banknotes and 0.5 million coins were returned to Eesti Pank.

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

Year	Value (EEK million)		Number (millions)			
	Issued by Eesti Pank	Received by Eesti Pank	Issued by Eesti Pank		Received by Eesti Pank	
			banknotes	coins	banknotes	coins
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
2003	8,495.8	8,282.8	88.9	23.1	86.8	0.5

Cash turnover between Eesti Pank and credit institutions decreased in 2003, particularly the turnover of banknotes of higher denomination; the turnover of 2-, 5- and 10-kroon banknotes increased. Therefore, the volume of banknotes decreased less than the value of issued and returned banknotes. The circulation period of banknotes became longer as a rule (see Table 7.6).

All banknotes returned to Eesti Pank are sorted. Worn-out banknotes are destroyed and the rest are returned to circulation. In 2003, 12.2 million banknotes with the total value of 1,009.4 million kroons were withdrawn from circulation (see Table 7.7). Less cash was destroyed at the central bank than in previous years.

Table 7.6. Circulation speed of banknotes

Denomination	Circulation speed (months)			
	2000	2001	2002	2003
2-kroon notes	12.5	11.7	11.0	11.0
5-kroon notes	11.9	9.6	8.6	8.8
10-kroon notes	10.1	8.4	7.4	7.1
25-kroon notes	4.8	3.5	3.1	3.9
50-kroon notes	8.0	7.2	7.2	7.6
100-kroon notes	4.8	4.1	5.7	6.3
500-kroon notes	8.0	7.0	11.8	14.4

Table 7.7. Worn-out banknotes withdrawn from circulation

Denomination	Value (EEK million)				Number (millions)			
	2000	2001	2002	2003	2000	2001	2002	2003
1-kroon notes	1.5	1.0	0.4	0.1	1.5	1.0	0.4	0.1
2-kroon notes	9.2	9.0	6.2	3.2	4.6	4.5	3.1	1.6
5-kroon notes	27.5	22.0	16.9	8.6	5.5	4.4	3.4	1.7
10-kroon notes	29.7	17.2	28.8	13.8	3.0	1.7	2.9	1.4
25-kroon notes	77.1	21.1	109.9	75.3	3.1	0.8	4.4	3.0
50-kroon notes	34.6	51.1	27.5	31.7	0.7	1.0	0.6	0.6
100-kroon notes	567.8	627.9	383.3	245.5	5.7	6.3	3.8	2.5
500-kroon notes	739.2	1,314.5	770.4	631.2	1.5	2.6	1.5	1.3
Total	1,486.7	2,063.8	1,343.4	1,009.4	25.5	22.4	20.1	12.2

Expert Analysis of Cash

Expert analysis of cash (mostly banknotes) is one of the major tasks of Eesti Pank's Cash and Security Department. The bulk of such cash consists of worn-out and damaged Estonian banknotes brought to credit institutions by customers. The aim of expert analysis is to determine whether it is possible to replace the banknotes or coins for the customer. This is done if the banknote is authentic, more than half of it is intact, and the serial number is legible in full; coins must carry at least their denomination and the date of minting.

In 2003, the Cash and Security Department examined 2,955 Estonian banknotes, with 80% of them damaged. At the request of credit institutions, the authenticity of foreign currency was checked and respective expert opinions given. A total of 467 foreign banknotes were examined, of which 446 proved to be forgeries.

Technological Innovations

In 2002 the main emphasis in cash management was on improving the organisational side, which brought Eesti Pank the Bureau Veritas Quality International's ISO 9001:2000 quality certificate on cash handling and cash operations. However, in **2003 the focus was on renewing technology, primarily with the aim of guaranteeing Eesti Pank's readiness for the introduction of the euro**⁹. A new cash accounting system was created, which was completed and launched in March 2004. Compared to the old system, the new technological

⁹ See also the Strategic Development Plan of Eesti Pank for 2004–2006, III, 13.

solution is more up-to-date, has more functions, and enables parallel processing of two currencies. This is important for exchanging data with the ECB during the transition to the euro. Alongside with developing cash management, general security was improved and possible risks were reduced.

As part of Eesti Pank's new building, a new car lock was completed in 2003, which provides the central bank with a considerably more secure entrance and guarantees better and safer servicing of cash transporting vehicles. The new security lock also allows checking of all vehicles entering Eesti Pank at a lower risk.