

## IX. PAYMENT AND SETTLEMENT SYSTEM PERFORMANCE

### Systemic Development in 1999

In 1999 three major development activities in the payment and settlement system were: to secure the year 2000 failure-free performance of the current inter-bank settlement system, to continue work at the new inter-bank settlement system and to compile a description of Estonia's payment and settlement system for the book on the EU applicant countries' payment systems published by the European Central Bank (ECB).

Preparations to secure inter-bank payment system against year 2000 failures started already in 1998 but the testing of the system and introduction of changes took place in 1999. During the testing in March-May the necessary IT changes were identified and thereafter implemented in June. The elaboration of procedural changes to manage emergencies, which could take place at the turn of the year, was much more labour-intensive. In sum, all necessary tasks were completed in time and the inter-bank settlement system operated smoothly during the critical period at the turn of the year as well.

**The work started in 1997 at the elaboration of the new inter-bank settlement system was continued.** Unlike the current Eesti Pank settlement system processing both large-value and retail payments, the new system will consist of two subsystems: a Designated Time Net Settlement (DNS) system for processing retail payments and a Real Time Gross Settlement (RTGS) system for processing large-value payments. According to current plans the DNS system will be launched in spring 2000 and the RTGS system in the first quarter of 2001.

**The European Central Bank published the so-called Blue Book in 1999 to get a detailed overview of the EU applicant countries' (Bulgaria, Czech Republic, Cyprus, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia) payment systems based on uniform methodology.** A chapter is dedicated to each country covering the general organisation of the payment system, payment instruments, inter-bank and securities settlement systems. Apart from the description of the payment system the Blue Book contains comprehensive statistics. Eesti Pank was responsible for providing the description of the payment system, collecting necessary statistical data and forwarding this to the European Central Bank. The above material is available on the web site of the European Central Bank<sup>1</sup>.

<sup>1</sup> See: <http://www.ecb.int/pub/pdf/paysys99appl.pdf/>.

## PAYMENT COMMITTEE

The Payment Committee coordinates the preparation of decisions in the field of the payment and settlement system and advises the Management on these issues.

Three areas can be distinguished in the activities of the Payment Committee in 1999. In current affairs the Committee focused on the performance of the existing settlement system used in Eesti Pank and the year 2000 reliability, issues related to processing, transport and destruction of cash and the reflection of the developments in the payment and settlement system in the Strategic Development Plan of Eesti Pank.

Under medium-term strategic choices in the payment and settlement system, issues related to the establishment of the Real Time Gross Settlement (RTGS) system and the Designated Time Net Settlement (DNS) system and underlying legal basis were considered. The latter involves the compatibility of the payment systems of the Estonian and EU financial institutions.

Analyses on the treatment of electronic or e-money in different countries and the potential use were of long-term interest.

## Settling of Payments through Eesti Pank

In 1999 the number of payments and the volume of settlements processed via Eesti Pank decreased by 7% and 29% respectively (see Table 9.1). One of the main reasons for reduction were mergers and bankruptcies which had taken place in the banking sector in 1998 and the growth rate falling below previous years. Payments up to 50,000 kroons were responsible for

**Table 9.1. Payments settled through Eesti Pank, between 1995 and 1999**

	Total	Change compared to the previous year (%)	Daily average	Share by the size of credit orders (%)			
				0 - 50,000 EEK	51,000 - 200,000 EEK	201,000 - 1,000,000 EEK	over 1,000,000 EEK
1995 Amount of credit orders (in thousands)	6,215.6	59.2	24.5	95.2	3.6	1.0	0.3
Volume of settlements (EEK mn)	149,325.7	41.1	587.9	18.9	14.2	16.7	50.3
Average size of payment (EEK thousand)	24.0	-	-	-	-	-	-
1996 Amount of credit orders (in thousands)	8,748.8	40.8	34.2	96.1	2.9	0.8	0.2
Volume of settlements (EEK mn)	212,249.4	42.1	829.1	19.5	11.7	14.2	54.7
Average size of payment (EEK thousand)	24.3	-	-	-	-	-	-
1997 Amount of credit orders (in thousands)	10,891.1	24.5	43.0	95.9	3.1	0.8	0.2
Volume of settlements (EEK mn)	323,830.6	52.6	1,280.0	14.0	9.9	11.2	65.0
Average size of payment (EEK thousand)	29.7	-	-	-	-	-	-
1998 Amount of credit orders (in thousands)	11,096.9	1.9	43.9	96.3	2.8	0.7	0.2
Volume of settlements (EEK mn)	331,157.5	2.3	1,308.9	13.5	8.9	9.6	68.0
Average size of payment (EEK thousand)	29.8	-	-	-	-	-	-
1999 Amount of credit orders (in thousands)	10,335.0	-6.9	41.2	97.3	2.1	0.5	0.1
Volume of settlements (EEK mn)	234,967.3	-29.1	938.9	15.3	8.8	9.6	66.4
Average size of payment (EEK thousand)	23.0	-	-	-	-	-	-

97% of all the payments and 15% of the turnover. Payments over a million kroons accounted for only 0.1% of the total amount of payments but for 66% of the turnover.

## Payment Instruments

In 1999 the share of **cash payments** accounted for 5% of all the payments settled through credit institutions and 0.5% of their turnover.

Like in previous years the most widely used non-cash payment instrument in 1999 was the **credit order** comprising 73% of the total number of non-cash payments and 99.6% of their turnover (see Table 9.2). More and more bank customers prefer more convenient and cheaper telebanking to the conventional paper-based credit order. In 1999 the turnover of **telebanking** credit orders was 298,788 million kroons, that of **telephone banking** 3,992 million kroons and of **Internet banking** 20,419 million kroons and their share in the total number of payments 36%; 3% and 10%, respectively.

The most widespread type of debit instrument was **payment with the bank card**, which accounted for 23% of the total number of payments, the turnover exceeding 3,870 million kroons. The significance of another debit instrument – **direct debit** – has increased sharply. In 1999 it was used for settling 849,000 payments (2% of the total number of payments).

Eesti Pank has carefully observed the problems as regards the introduction of a new retail payment instrument – **electronic money or e-money** – in the European Union and elsewhere in the world, as well as the respective steps taken by the Estonian banks.

By the end of 1999 credit institutions had issued 770,000 **bank cards**, 18% of which were passive (not used for making payment). More than 97% of bank cards were debit cards (see Table 9.3).

The number of **ATMs** increased by one fifth in 1999 and reached 591 by the end of the year (see Table 9.4). In about 90% of ATMs international bank cards issued in any country of the world can be used. The number of points of sale accepting bank cards was 3,267 at the end of 1999. Their number increased by more than 26% over the year.

**Table 9.2. Payments by payment instruments in 1999**

	Turnover (EEK mn)	Number of payments (thousand pieces)	Average size (EEK thousand)
Cash	5,438.0	1,842.7	3.0
Non-cash payments	1,050,320.8	35,949.3	29.2
Cheques	191.1	14.6	13.1
o/w travellers cheques	24.1	6.8	3.5
other cheques	167.1	7.7	21.6
Card payments	3,870.4	8,808.0	0.4
Direct debit	231.2	849.4	0.3
Credit orders	1,046,025.8	26,277.3	39.8
o/w standing orders	8,078.6	598.8	13.5
paper-based credit orders	250,763.2	6,829.8	36.7
telebank credit orders	298,788.0	13,628.9	21.9
telephone-bank credit orders	3,991.8	1,282.5	3.1
internet-bank credit orders	20,418.7	3,921.4	5.2
SWIFT	463,985.4	15.9	29,117.4
Unidentified	2.3	0.0	579.5
<b>Total</b>	<b>1,055,758.8</b>	<b>37,792.0</b>	<b>27.9</b>

**Table 9.3. Total amount of bank cards issued in Estonia, between 1995 and 1999 (thousand pieces)**

	1995	1996	1997	1998	1999
Domestic debit cards	108.2	381.3	406.1	292.3	59.5
o/w cash cards	86.2	116.3	56.5	51.0	15.1
debit cards	22.0	265.0	349.6	241.5	44.3
International debit cards	9.0	42.7	186.3	386.1	690.0
<b>Debit cards total</b>	<b>117.2</b>	<b>424.0</b>	<b>592.4</b>	<b>678.5</b>	<b>749.5</b>
Domestic credit cards	–	–	0.1	–	–
International credit cards	2.3	9.6	14.9	19.2	20.5
<b>Credit cards total</b>	<b>2.3</b>	<b>9.6</b>	<b>15.0</b>	<b>19.2</b>	<b>20.5</b>
<b>Debit and credit cards total</b>	<b>119.5</b>	<b>433.6</b>	<b>607.4</b>	<b>697.6</b>	<b>770.0</b>

**Table 9.4. Number of automated teller machines (ATMs) and points of sale (POS) accepting bank cards, between 1995 and 1999**

	1995	1996	1997	1998	1999
<b>Automated teller machines (ATMs) total</b>	<b>140</b>	<b>230</b>	<b>427</b>	<b>490</b>	<b>591</b>
o/w cross-usage ATMs	–	*	331	433	530
ATMs accepting cash payments	–	–	12	8	9
Cash dispensers	140	230	279	307	203
Cash and payment dispensers	*	*	110	126	327
Payment dispensers	–	*	38	57	61
<b>Points of sale accepting bank cards</b>	<b>250</b>	<b>1,200</b>	<b>2,153</b>	<b>2,586</b>	<b>3,267</b>

\* No data available.

## Cash Demand

### Issue of Banknotes and Coins and their Structure

By 31 December 1999 there was a total of 6,648.8 million cash kroons in circulation, of which 937 million kroons, ie 14% was in the vaults of Estonian credit institutions and 5,711.8 million kroons, ie 86% in circulation outside the banks.

Following a slight decrease in 1998, the total amount of cash in circulation increased sharply in 1999 – by 1,258.1 million kroons. Compared to 1998, the growth was larger in the second half-year.

In end-1999, the number of **100- and 500kroon banknotes** in circulation was the largest (see Table 9.5). Just like in previous years, the number of 500kroon banknotes in circulation increased in 1999 as well. The number of 2- and 25kroon banknotes went also up. The number of 2kroon banknotes has increased in the circulation mostly because the issue of one-kroon banknotes

was terminated in 1998. Therefore the number of one-kroon banknotes in circulation dropped whereas the number of 50kroon banknotes continued declining as well in 1999. The 50kroon banknote has turned to be relatively unpopular in Estonia. The number of all coins in circulation has increased except that of 5kroon coins, as its users prefer banknotes of the same denomination.

**Table 9.5. Banknotes and coins in circulation**

Denomination	By sum (EEK mn) as of				By pieces (mn) as of			
	31.12.96	31.12.97	31.12.98	31.12.99	31.12.96	31.12.97	31.12.98	31.12.99
1kroon notes	11.1	12.0	11.1	7.5	11.1	12.0	11.1	7.5
2kroon notes	12.0	12.6	13.9	16.6	6.0	6.3	7.0	8.3
5kroon notes	30.2	31.5	30.5	30.9	6.0	6.3	6.1	6.2
10kroon notes	66.8	65.1	61.9	61.3	6.7	6.5	6.2	6.1
25kroon notes	125.8	127.5	126.9	144.3	5.0	5.1	5.1	5.8
50kroon notes	94.6	88.7	72.4	61.7	1.9	1.8	1.4	1.2
100kroon notes	1,348.0	1,207.3	1,058.9	1,082.9	13.5	12.1	10.6	10.8
500kroon notes	3,245.0	3,837.9	3,970.5	5,185.9	6.5	7.7	7.9	10.4
<b>Banknotes total</b>	<b>4,933.5</b>	<b>5,382.8</b>	<b>5,346.1</b>	<b>6,591.1</b>	<b>56.7</b>	<b>57.8</b>	<b>55.4</b>	<b>56.3</b>
5sent coins	2.2	2.2	2.2	2.2	43.8	43.7	43.6	43.6
10sent coins	5.0	6.0	6.8	7.7	50.3	60.0	67.8	77.0
20sent coins	7.2	8.5	9.6	11.0	36.1	42.3	48.1	54.9
50sent coins	7.1	7.8	8.4	9.3	14.2	15.7	16.7	18.7
1kroon coins	20.4	18.9	4.1	14.1	20.4	18.9	4.1	14.1
5kroon coins	8.7	9.1	8.8	8.6	1.7	1.8	1.8	1.7
<b>Coins total</b>	<b>50.6</b>	<b>52.5</b>	<b>39.8</b>	<b>52.9</b>	<b>166.5</b>	<b>182.5</b>	<b>182.1</b>	<b>210.1</b>
<b>Commemorative coins</b>	<b>2.6</b>	<b>3.3</b>	<b>4.7</b>	<b>4.8</b>	<b>0.0</b>	<b>0.0</b>	<b>0.1</b>	<b>0.1</b>
<b>Sum total</b>	<b>4,986.8</b>	<b>5,438.5</b>	<b>5,390.7</b>	<b>6,648.8</b>	<b>x</b>	<b>x</b>	<b>x</b>	<b>x</b>

**Table 9.6. Structure of banknotes and coins in circulation (%)**

Denomination	By sum as of				By pieces as of			
	31.12.96	31.12.97	31.12.98	31.12.99	31.12.96	31.12.97	31.12.98	31.12.99
1kroon notes	0.2	0.2	0.2	0.1	19.6	20.8	20.0	13.3
2kroon notes	0.2	0.2	0.3	0.3	10.6	10.9	12.6	14.8
5kroon notes	0.6	0.6	0.6	0.5	10.6	10.9	11.0	11.0
10kroon notes	1.4	1.2	1.2	0.9	11.8	11.3	11.2	10.9
25kroon notes	2.6	2.4	2.4	2.2	8.9	8.8	9.2	10.3
50kroon notes	1.9	1.6	1.4	0.9	3.3	3.1	2.6	2.2
100kroon notes	27.3	22.4	19.8	16.4	23.8	20.9	19.1	19.2
500kroon notes	65.8	71.3	74.3	78.7	11.4	13.3	14.3	18.4
<b>Banknotes total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
5sent coins	4.3	4.2	5.5	4.1	26.3	24.0	24.0	20.8
10sent coins	9.9	11.4	17.0	14.5	30.2	32.9	37.2	36.6
20sent coins	14.3	16.1	24.2	20.8	21.7	23.2	26.4	26.2
50sent coins	14.0	14.9	21.0	17.6	8.5	8.6	9.2	8.9
1kroon coins	40.2	36.0	10.2	26.7	12.2	10.4	2.2	6.7
5kroon coins	17.3	17.3	22.2	16.2	1.1	1.0	1.0	0.8
<b>Coins total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
<b>Commemorative coins</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
<b>Sum total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>x</b>	<b>x</b>	<b>x</b>	<b>x</b>
o/w banknotes	98.9	99.0	99.2	99.1	x	x	x	x
coins	1.0	1.0	0.7	0.8	x	x	x	x
commemorative coins	0.1	0.1	0.1	0.1	x	x	x	x

Of the total amount of cash in circulation banknotes accounted for nearly all of it, the coins for less than 1% (see Table 9.6). 500kroon banknotes made up about four fifths of the total sum of banknotes, their share increasing constantly, whereas 100kroon banknotes made up one sixth. The share of other denominations was significantly lower.

With the increase of the 500kroon banknotes in circulation, the average value of a banknote in circulation increased by 20.6 kroons and amounted to **117.1 kroons** on 31 December. The average value of a coin in circulation was **25.2 sents**.

## Cash Movement

In 1999 Eesti Pank issued **8,245.8 million kroons** and received **6,986.5 million kroons** (see Table 9.7). The sum of cash returned to Eesti Pank amounted to 130% of the total sum of cash in circulation at the beginning of the year. The ratio of the returned cash to cash in circulation has been constantly increasing, being 108% in 1997 and 116% in 1998.

In terms of numbers Eesti Pank issued 61.6 million banknotes and 28.3 million coins. 60.7 million banknotes and 1.2 million coins were returned to Eesti Pank. Like in previous years, considerably less coins were returned than issued. The volume of returned banknotes and coins has decreased and that of issued banknotes and coins has increased against 1998. Including the cash received from the manufacturer by the Treasury Vault of the Cash Department of Eesti Pank, the vault's turnover totalled 320 tons in 1999.

The returned banknotes and coins are sorted in the sorting unit of the Cash Department. The worn-out banknotes and coins are separated and destroyed. **34 million worn-out banknotes were withdrawn from circulation with the total worth of 2,197.5 million kroons in 1999** (see Table 9.8). The rest of the cash is returned to circulation. In 1999 the automatic cash sorter sorted all banknotes.

Due to the year 2000 problem-related potential increase of cash demand in December 1999 the cash reserves of Eesti Pank were increased to an amount enabling to double the cash in circulation. The actual increase of cash in circulation was about 10%, mainly due to seasonal factors.

**Table 9.7. Movement of cash between Eesti Pank and credit institutions, between 1996 and 1999**

	By sum (EEK mn)		By pieces (mn)			
	Issued from Eesti Pank	Received by Eesti Pank	Issued from Eesti Pank		Received by Eesti Pank	
			banknotes	coins	banknotes	coins
1996	5,073.5	4,423.9	76.5	24.8	76.0	3.3
1997	5,861.6	5,409.6	71.8	20.6	71.0	4.7
1998	6,285.4	6,314.0	60.0	19.8	62.2	3.9
1999	8,245.8	6,986.5	61.6	28.3	60.7	1.2

**Table 9.8. Worn-out banknotes withdrawn from circulation, between 1996 and 1999**

Denomination	By sum (EEK mn)				By pieces (mn)			
	1996	1997	1998	1999	1996	1997	1998	1999
1kroon notes	5.4	4.6	5.1	4.9	5.4	4.6	5.1	4.9
2kroon notes	6.3	4.5	8.4	7.7	3.2	2.3	4.2	3.9
5kroon notes	50.5	18.4	32.9	22.3	10.1	3.7	6.6	4.5
10kroon notes	108.5	48.4	63.8	43.4	10.9	4.8	6.4	4.3
25kroon notes	139.7	122.7	116.1	117.1	5.6	4.9	4.6	4.6
50kroon notes	90.8	83.8	57.1	56.4	1.8	1.7	1.1	1.1
100kroon notes	611.8	866.1	730.7	845.5	6.1	8.7	7.3	8.4
500kroon notes	104.5	762.6	1,184.9	1,100.1	0.2	1.5	2.4	2.2
<b>Total</b>	<b>1,117.5</b>	<b>1,911.1</b>	<b>2,199.0</b>	<b>2,197.5</b>	<b>43.2</b>	<b>32.1</b>	<b>37.7</b>	<b>34.0</b>

## Introduction of New Banknotes, Cash Examination

In 1999 the new 100kroon banknote was released, with the technical specification and renewed design worked out by the Money Laboratory of the Cash Department. The new banknote has a number of new modern security features such as hand-engraved portrait of Lydia Koidula, holographic security band lined with microprint, watermark portrait, colour shifting ink, fluorescent fibres visible when held under an ultraviolet light, fluorescent non-metallic security thread, low vision feature and other non-visible security features. The introduced changes enhance significantly the security of the banknote and simplify its distinction from counterfeit and forged currency. The banknote is designed by Vladimir Taiger and printed by *Bundesdruckerei GmbH* (Germany).

In 1999 the Money Laboratory worked out the technical specification of the new 500kroon banknote as well. The contract with the manufacturer –*Bundesdruckerei GmbH* – has been concluded. The new 500kroon banknotes will be released into circulation in 2000.

Apart from upgrading the security and durability of banknotes the Cash Department of Eesti Pank has also been **cost efficient** in ordering. A tender for the lowest bidding has preceded each order whereas invitations to tender have been issued to several internationally recognised banknote printers. The bidding has helped to identify the best quality and price option. Thus, recently the banknotes have been printed by *Bundesdruckerei GmbH*, the coins minted by South African Mint (Pty) Ltd (Republic of South Africa) and *Suomen Rahapaja Oy* (Finland).

For quality control and examination of cash withdrawn from circulation, the Money Laboratory introduced a new technology to measure surface profiles and conduct spectrophotometric analysis of banknotes and coins in 1999.

The Money Laboratory tested the samples of 20sent coins issued in 1999. 118 examinations were conducted on 1,314 worn-out and damaged Estonian banknotes to determine the causes of damage and changes in the parameters of the banknotes. Examinations were also carried out on 276 forged Estonian banknotes. 12.6 million 100- and 500kroon banknotes withdrawn from circulation were identified before destruction. The correspondence to the standard of banknotes from the US, Sweden, Germany, France, Italy, UK, Belgium, Canada and Norway submitted to the examination by credit institutions was checked. The credit institutions were notified of new banknotes issued by foreign central banks and withdrawal of the old.

## Commemorative Coins, Other Numismatic Items

When issuing commemorative coins Eesti Pank has considered the significance of the event for the Republic of Estonia or the Bank as well as the potential collector demand. **In 1999 Eesti Pank issued two commemorative coins.** One is dedicated to the 80th anniversary of Eesti Pank and the introduction of the euro as a single currency, the other to the 130th anniversary of the first Estonian Song Festival.

The unusual nominal value of the **golden commemorative coin dedicated to the 80th anniversary of Eesti Pank and the introduction of the euro** – 15.65 kroons – refers to the exchange rate of the euro to the Estonian kroon (1 EUR = 15.65 EEK). The averse of the coin bears the national emblem of the Republic of Estonia and the reverse – a very old and widespread symbol with a coiling spiral symbolising development and movement. The spiral finds its beginning in eleven stars symbolising countries joining the third phase of the European Economic and Monetary Union (EMU). The coin was designed by Tiit Kirsipuu and minted by *Münze Österreich AG* (Austria).

**The one-kroon commemorative coin dedicated to the anniversary of Song Festivals** is similar to the regular one-kroon coin as regards its alloy and parameters. The reverse of the commemorative coin depicts the Song Festival Ground. The coin was designed by Mati Karmin and minted by *Lietuvos Monetu Kalykla* (Lithuania). The postcard-size package displays both sides of the coin.

Dedicated to its 80th anniversary Eesti Pank has also published a **collector's booklet** containing a specimen of the 100kroon banknote issued in 1999, 5kroon coin and the anniversary stamp. In 1999 Eesti Pank published also a **coin booklet** of coins issued currently. Both the collector's booklet and the coin booklet were designed by Tiit Jürna and printed by Zenith Print and Packaging Ltd (Great Britain).

Beginning from end-1999 collectors can also purchase numismatic and bonistic objects of Eesti Pank by mail<sup>2</sup>. Besides commemorative coins the Bank sells also specially packaged, non-circulated banknotes and framed sheets of the new 100kroon banknotes. **In 1999 the Bank earned 1.1 million kroons of profit from the sale of numismatic items.**

<sup>2</sup> Ordering by mail, the customer will inform the Cash Department of Eesti Pank of his/her request (Estonia Avenue 13, 15095 Tallinn, Republic of Estonia). The Bank will post the invoice and upon payment the purchased items will be posted to the customer. Ordering by e-mail is also possible (bkalbre@epbe.ee).