BANK FOR INTERNATIONAL SETTLEMENTS

# PAYMENT SYSTEMS
# IN
# THE GROUP OF TEN COUNTRIES

**Prepared by the Committee on Payment and Settlement Systems**
**of the central banks of the Group of Ten countries**

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# Table of contents

# FOREWORD

This is the fourth edition of the reference work on payment systems in the Group of Ten countries prepared by the Committee on Payment and Settlement Systems of the G-10 central banks. This volume has come to be known as the "Red Book" and is published under the aegis of the Bank for International Settlements. Previous editions have been translated in whole or in part into French, German, Italian, Japanese and Chinese.

The central banks of the Group of Ten countries, first through the Group of Experts on Payment Systems and subsequently through the Committee on Payment and Settlement Systems, have been influential in improving the public understanding of payment system arrangements in their countries and of the various policy issues connected with such arrangements. Payment systems are now also seen as encompassing not only retail money transfer systems used by businesses and consumers for commercial purposes but also large-value interbank funds transfer systems that underpin the money and credit markets of market-oriented economies. In addition, major settlement systems include so-called exchange-for-value systems that are increasingly used for the settlement of securities transactions. Public interest in issues relating to both the economic efficiency and financial risks of all types of payment and settlement has continued to increase in recent years.

Compared with the previous editions, this fourth edition of the Red Book has been extensively revised. The coverage of different segments of each country's payment system has been broadened, statistical information has been improved and presented in time series form, a special chapter on cross-border payment system arrangements has been added, and a comprehensive list of terms and abbreviations has been included. All this should make it easier for the reader to understand payment system arrangements in the individual G-10 countries and to compare these arrangements across countries.

I would like to thank the G-10 central banks for their willingness to devote the necessary resources to the publication of this revised edition. A special word of thanks should go to the members of the Editorial Group, and particularly to the Chairman of that Group, Mr. Van den Bergh, for coordinating the work. Finally, I would like to express my gratitude to the BIS for the professional support given by its staff in the preparation of this volume.

In the future, the Committee on Payment and Settlement Systems will also publish separate country studies on payment systems in non-G-10 countries. This will be done in association with the central bank of the country concerned. Such special editions are currently being prepared in collaboration with the Reserve Bank of Australia, the Bank of Finland, the Central Bank of Norway and the Central Bank of Iceland.

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December 1993

# INTRODUCTION

Given the complexity of the arrangements and issues involved and the differences in the legal, regulatory and institutional environment it is natural that payment systems should differ from country to country. At the same time they share many similarities. The country chapters that follow provide a descriptive analysis of the various operational, financial and legal aspects of each country's payment systems. To facilitate comparison between payment systems in different countries, the descriptions are based on a common framework.

The first section of each country chapter gives an overview of the general institutional aspects of the payment systems in the respective country. These include the relevant legislation and regulations in force, the types of financial intermediary that provide payment services and the role of the central bank and other private or public sector bodies.

The second section looks at the payment instruments used by non-banks and reviews recent developments in the retail payments area. The third section deals with interbank exchange and settlement circuits. It provides detailed information on the structure, operation and administration of major large-value interbank systems. Particular attention is paid to the risk in interbank settlement systems and its management. The main projects and policies being implemented are highlighted.

Reflecting the increased interest on the part of the central banks of the Group of Ten countries in the operation of so-called exchange-for-value settlement systems, the fourth section discusses the special use of interbank transfer systems for the settlement of international transactions and for the settlement of domestic securities transactions. The final section describes the role of the central bank in interbank settlement systems, in particular in providing settlement facilities for the banking system. The relationship between payment systems and the operation of monetary policy is also considered.

Each country chapter includes a list of selected references and a set of statistical tables. The latter are presented in time series form in order to facilitate the analysis of recent developments. It should be borne in mind, however, that, although considerable improvements have been made in the quality of the statistical data, they are not in all cases complete or uniform and in some cases estimates have had to be made.

In addition to the specific country chapters, there is also a separate chapter on cross-border payment system arrangements. These have undergone important changes in recent years and a number of systems in the wholesale and retail areas are described in this chapter. Finally, the annex contains cross-country comparative tables, a glossary and a list of the members of the Editorial Group which was responsible for putting this volume together.

The structure and content of this fourth edition of the "Red Book" are influenced by the analysis carried out by the central banks of the Group of Ten countries on a number of payment issues in recent years. The result of this analysis has been made available to a wider public through various reports which have been published by the BIS. These include "Large-value Funds Transfer Systems" (1990), the "Report of the Committee on Interbank Netting Schemes" (1990), "Delivery versus Payment in Securities Settlement Systems" (1992) and "Central Bank Payment and Settlement Services with Respect to Cross-border and Multi-currency Transactions" (1993). Moreover, reflecting the collaboration between EC and G-10 central bank working groups, the membership of which overlaps to some extent, this volume also draws on the report published in 1992 by the Committee of Governors of the Central Banks of the Member States of the European Economic Community on "Payment Systems in EC Member States" (the so-called "Blue Book").

# PAYMENT SYSTEMS IN BELGIUM

# Table of contents

## INTRODUCTION

Pursuing the trends that had already been set, evolving payment habits and technological innovations thoroughly changed the Belgian payment systems during the last decade.

Cash payments became relatively less important, which was reflected in the declining share of cash in the money supply ($M_1$). Nearly every Belgian holds a bank account. Among traditional cashless payment instruments, we notice the predominance of the credit transfer and its derivatives over the cheque.

The fact that Belgium deployed electronic technology at an early stage is shown both in the appearance and spread of new payment systems and instruments available to customers of financial institutions (ATMs, POS terminals) and in the rationalisation of the processing of traditional payment media within the banking system (truncation, automated clearing). In establishing the latter, the National Bank of Belgium played an important role.

Until now, credit institutions have been able to balance competition and cooperation, with cooperation taking the form of shared technical infrastructure and common interbank standards.

Though still on a small scale, non-banks, such as issuers of credit and travel and entertainment cards, large retail chains and issuers of luncheon vouchers are becoming more and more involved in the payment systems.

From the consumer's point of view, the charging recently implemented by most banks indicates that the era of freely offered payment services is over.

## 1. INSTITUTIONAL ASPECTS

### 1.1 General legal aspects

A new law on the status and supervision of credit institutions was adopted on 22nd March 1993. The purpose of this law is to protect the savings of the public and to safeguard the smooth functioning of the credit system by laying down rules for the establishment and the operations of the credit institutions as well as for the supervision of the latter. This law also introduces the provisions of the Second Banking Directive of the EEC.

Moreover, this law contains an important chapter pertaining to netting between credit institutions. The law seeks to guarantee the legal certainty of set-off agreements for debts between two or more credit institutions, where one of these institutions is involved in bankruptcy or in any other case of concurrent claims which is governed by Belgian law.

Until recently, the effectiveness of netting arrangements could be challenged under Belgian law, with regard to two principles of bankruptcy law: (i) the prohibition of any set-off after bankruptcy, except between related debts, and (ii) the principle that the bankruptcy decision of the court has a retrospective effect, starting from the first hour of the day on which it was made ("zero hour rule").

These principles were likely to prevent the participation of the Belgian banks in international interbank netting systems, thereby depriving them of the advantages which might result from the consequent reduction in settlement costs and in credit and solvency risks involved in international financial operations. Moreover, the uncertainties which existed in Belgian law on the subject of the possibility of relying upon netting agreements against third parties diminished the attraction of locating the centre of an international netting system in Brussels.

This is why express recognition is given, through Article 157 of the law on the status and supervision of credit institutions, to the legal validity of set-off agreements for claims between credit institutions themselves and between credit institutions and a clearing house, and to the ability to

invoke such agreements against third parties, subject to the conditions defined in this provision. Particularly, it is clear that it is no longer required that the claims to be set off should be related. The article also states that payments made by or to a credit institution on the date on which it has been declared bankrupt shall be valid if they preceded the time of the bankruptcy decision or if they were made without being aware of the fact that the credit institution was bankrupt.

Apart from one legal text which deals with cheques (Law of 1st March 1961), there is no specific legislation concerning payment instruments or systems. There is therefore no specific legal provision governing other "traditional" payment media or electronic payment systems. Relations between financial institutions, consumers and retailers are governed by private contracts. On a more general level, the problem of authentication in systems not involving manual signature is not covered by specific legislation.

The financial sector is also covered by the general anti-trust regulation (Law of 5th August 1991) which forbids practices which restrict competition. The description of this concept has largely been based on Articles 85 and 86 of the EEC Treaty.

### 1.2 Financial intermediaries that provide payment services

The banking system comprises three broad categories of financial intermediaries. Their numbers, as of December 1992, subdivided into Belgian and foreign institutions, are given in the following table:

| Institutions | Total number | Under Belgian law | Under Foreign Law | |
|---|---|---|---|---|
| | | | EEC | non-EEC |
| Commercial banks | 94 | 56 | 22 | 16 |
| Savings banks .... | 28 | 27 | 1 | 0 |
| Public credit institutions ..... | 6 | 6 | 0 | 0 |

Although each of these types of financial institutions was originally fairly specialised in terms of markets and products, the legal distinctions, more specifically with respect to supervision, have disappeared completely since the new law on the status and supervision of credit institutions came into force.

To these three broad categories must be added the Postcheque, which has not the status of credit institution but constitutes the financial department of the Postal Administration. The Postcheque has recently also been allowed to offer credit cards linked to customers' sight accounts.

Non-bank institutions are also represented in the payment media market, in particular:

- companies issuing credit and travel and entertainment cards (four companies, only one of which has no connection with the banking sector);
- commercial companies issuing in-house cards, these being essentially either petrol companies or large retailers;
- companies issuing luncheon vouchers (see Section 2.2.5).

### 1.3 The role of the central bank

As the issuing authority, the central bank - the National Bank of Belgium (NBB) - issues notes on its own behalf and coin on behalf of the Treasury.[1] While the production of notes takes place in its own printing department, the minting of coin is the prerogative of the Royal Mint of Belgium, responsible to the Ministry of Finance.

Banknote distribution is carried out at the NBB's head office in Brussels, as well as at three branches (of which one is in Luxembourg) and fifteen[2] of the 20 agencies.

Monetary policy is determined and implemented by the National Bank of Belgium. It also manages the national gold and foreign exchange reserves. As lender of last resort, the central bank grants credit to credit institutions only. Finally, the NBB handles, as an agent for the Government, the receipts and expenses for the Treasury, as well as the administration and accounting of government bonds. It is not involved in retail activities.

The NBB is greatly involved in the interbank clearing mechanisms: the traditional clearing house (located in Brussels and at eighteen branches and agencies of the central bank), the automated system (CEC) and the Securities Clearing System. It also plays a leading role in setting standards for the financial system.

The NBB assumes general responsibility for the smooth operation of payment systems and oversees the operation of these systems in the light of its historical tradition.

The National Bank of Belgium is not in charge of banking supervision. The supervision of individual credit institutions is undertaken by a legally autonomous institution: the Banking and Finance Commission (BFC). One member of the Board of Directors of the NBB is a member of the Board of the BFC as of right. The BFC must consult the National Bank before publishing regulations concerning solvency and liquidity. The National Bank of Belgium collects the periodic and annual prudential returns made by the credit institutions and transmits them to the BFC.

All the credit institutions are supervised by the BFC; the Postcheque, however, is supervised by the Minister of Finance.

### 1.4 The role of other private and public sector bodies

There are four main interbank organisations operating in the payment system field:

- the Clearing House of Belgium (see Section 3);
- the non-profit-making CEC (Centre for the Exchange of operations to be Cleared), founded in 1974 by the banking sector as a whole, in order to automate the exchange of payment transactions (see also Section 3);
- Banksys, a society which manages a large shared network of ATMs and POS terminals (see Section 2.2.4(e));
- the Bank Card Company (BCC), which is entrusted with the administration of credit cards (see Section 2.2.4(b)).

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1 Within the framework of the Belgian-Luxembourg Economic Union (BLEU), Belgian coins and notes are legal tender in the Grand Duchy of Luxembourg, but the reverse is not the case.

2 As a result of an internal reorganisation, the National Bank of Belgium converted five of her agencies into representative offices, in which no transactions take place with the financial institutions.

The Belgian Banker's Association (Belgische Vereniging der Banken - Association Belge des Banques) and the Association of Belgian Savings Banks (Belgische Spaarbankenvereniging - Groupement Belge des Banques d'Epargne) are two professional organisations whose aim is to promote their members' professional interests, mainly through economic studies and fiscal, legal and technical advice.

In 1990 both associations set up an ombudsman function, to settle small disputes - including those in the field of payment systems - between their members and their customers.

## 2. SUMMARY INFORMATION ON PAYMENT MEDIA USED BY NON-BANKS

### 2.1 Cash payments

Cash comprises notes in denominations of B.fr. 100, 500, 1,000, 5,000 and 10,000[3] and coins in denominations of B.fr. 0.50, 1, 5, 20, 50 and 500. There has been a shift between notes and coin in recent years, in the form of a substitution of notes by coins of B.fr. 20 and 50. Among the notes, the B.fr. 5,000 denomination represents the largest share of the total stock of notes in circulation (65% by value at end-1992), despite the growing success of ATMs, which only deliver notes of B.fr. 1,000 (which accounted for 25.4% of the value of notes in circulation at 31st December 1992). Banknotes constitute 96.0% of total cash in circulation and coin 4.0%. The issue of coin is legally restricted to B.fr. 20 billion (US$ 603 million). Coins are legal tender only up to a certain amount.

It is impossible to estimate the value or number of payments made using cash. The only indication available lies in the share of cash in $M_1$, which has recorded a marked decline over a number of years. It amounted to 34% at end-1992, compared with 43.7% at end-1980. The total stock of cash in circulation at 31st December 1992 amounted to B.fr. 448.1 billion (US$ 13.5 billion).

### 2.2 Non-cash payments

Deposit money comprises sight deposits held by non-financial economic agents with financial intermediaries legally entitled to receive such deposits (banks, savings banks, public credit institutions and the Postcheque).

There is no statutory definition of sight accounts. According to the regulation[4] governing the financial data which the banks have to submit monthly to the central bank and the Banking and Finance Commission, sight accounts are those in which money which has been deposited can be immediately withdrawn.

The Royal Decree No. 56 of 10th November 1967 obliges businesses to hold an account to which credit transfers can be made by their customers. Generally, these are sight accounts, although this is not strictly necessary.

The usual practice in respect of "ordinary" customers as regards value dates, is as follows:

- accounts are debited one working day before the settlement date;
- accounts are credited one working day after the settlement date (in the case of cheques in the course of collection, the credit is temporarily revocable).

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3 Notes of B.fr. 10,000 have only been issued since 11th December 1992.

4 Royal Decree of 24th November 1937.

There are no formal regulations governing these practices. Maximum time limits for crediting counterparties are not statutory. Credit institutions, however, must execute payment orders with promptness, on the base of the general law of contract.

As the CEC operates on a round-the-clock basis, payment orders that are submitted in the morning are normally credited to the beneficiary bank in the afternoon.

The principle of allowing providers of payment services to charge sight account holders for such services was adopted in 1990, enabling financial institutions to charge a maximum of B.fr. 5 (US$ 0.15) per debit operation (see also Section 2.3.1).

Deposit money is rather heavily concentrated: amongst banks and savings banks, the three largest institutions account for 80% of deposits by value.

### *2.2.1 Credit transfer*

The most commonly used payment medium in Belgium is the credit transfer. The order is given by the customer making the payment to his bank either in paper form - handed in at his bank branch or sent by post - or in automated form (diskette, magnetic tape, telecommunications). An estimated 528.6 million credit transfers (including standing orders and inpayment transfers; see below) were made in 1992.

The standing order is a form of credit transfer created in order to rationalise the system for recurring payments (payment of rent, etc.). In 1992 an estimated total of 46.97 million payments were made in the form of standing or variable standing orders.

One significant development is the growing dematerialisation of payment orders transmitted by customers. More and more firms are communicating their payment orders via magnetic media or telecommunications, which obviates the need to capture the data within the financial system. For 1992 it is estimated that 189.31 million payment orders - or 36% of all credit transfers and payments made in the form of standing and variable standing orders - were submitted in paperless form.

There is also a hybrid payment instrument offered chiefly by the Postcheque, the inpayment transfer, which enables a payment to be made to a holder of a (bank or postal) sight account on the basis of a cash inpayment at a post office. This instrument is primarily intended for payers who do not have a sight account. In 1992 97.2 million inpayment transfers were made for a total value of B.fr. 7,488 billion (US$ 233 billion), giving an average of B.fr. 77,078 (US$ 2,400) per transaction.

### *2.2.2 Cheques*

Up to now, the cheque has been the second most frequently used cashless payment instrument after the credit transfer. In recent years, however, its use has been diminishing and it is now expected that, in volume terms, debit and credit card payments will soon become more important.

By supplying creditworthy customers with cheque guarantee cards, financial institutions promoted the acceptability of the cheque to creditors. These cards serve as a guarantee that any cheque drawn will be honoured up to an amount of B.fr. 7,000 (US$ 218) whether or not the drawer's sight account has sufficient cover. To make the guarantee effective, the number of the cheque guarantee card must be written on the reverse of the cheque. It is the duty of the payee to check the validity of the card and to see whether the information on the card corresponds with that on the cheque. The cheque guarantee card generally carries an automatic overdraft facility of B.fr. 25,000 (US$ 753) on which interest is charged. The only restriction is that a permanent debit balance for more than three consecutive months is not allowed. On 31st December 1992 there were 4.60 million cheque guarantee cards in circulation (4.05 million of them were eurocheque cards), equivalent to a theoretical average of forty-seven cards for every one hundred sight accounts.

In addition to cheques issued by individual financial institutions and postal cheques, the eurocheque is commonly used domestically. Unlike other cashless payment instruments, the cheque can be used for several successive payments, by means of endorsement. This practice is, however, relatively limited.

The Postcheque issues a special category of cheques, known as the postal draft. This is a payment order, sent by post, which the recipient can cash at a post office or at a financial institution of which he is a customer. This payment medium enables a payment to be made to a payee who has no sight account or whose sight account number is not known by the initiator of the transaction. The draft is drawn on a postal current account, possibly with a financial institution as intermediary. The Government and its various agencies make extensive use of the postal draft system, for instance for the payment of social security benefits (e.g. pensions, family allowances). In 1992 25.8 million postal drafts were issued for a value of B.fr. 477.5 billion (US$ 14.9 billion).

### *2.2.3 Direct debits*

The direct debit is a mechanism created in 1980 whose purpose, like that of the standing order and variable standing order, is to simplify the execution of regular payments. In 1992 it was estimated that 81.3 million payments were executed under direct debit agreements. Direct debits are mainly used to pay electricity and telephone bills and for subscriptions.

### *2.2.4 Payment cards*

#### *(a) Debit cards*

Apart from cheque guarantee cards, which are not, strictly speaking, a payment medium, the financial institutions and the Postcheque issue debit cards which can be used at ATMs and, usually, at POS terminals.

Two recent developments are underway in this field:

- the gradual amalgamation of the debit card and cheque guarantee card, so as to create a single multi-function card;
- the increasing promotion of the logo of the issuing financial institution, whereas, in the early years of their development, debit cards primarily bore the trademark of the interbank network to which they provided access.

All debit cards have magnetic stripes and require a personal identification number (PIN) to be keyed in on the keyboard of the terminal before the services can be accessed. For payment transactions accepted by the system (on-line authorisation), the retailer who is paid by means of a debit card is guaranteed payment.

On 31st December 1992 there were some 6.1 million debit cards in circulation, 5.74 million of them with access to both ATMs and POS terminals. This represents a ratio of sixty-two cards for every one hundred sight accounts, or sixty cards for every one hundred inhabitants.

The cost to the consumer of using debit cards - at ATMs and POS terminals - consists in theory only of an annual fee, set at B.fr. 165 (US$ 5). It should be noted, however, that as regards POS transactions, the large retail sector decided in September 1992 to pass on to consumers the fee of B.fr. 4 (US$ 0.12) which the interbank network imposed on them.

In the last few years the use of debit cards has started to become internationalised. At the ATM level, there is a reciprocal agreement between the Postcheque and its counterpart organisations in the Grand Duchy of Luxembourg and France. Holders of Banksys cards also have access, within the framework of the Europay community, to ATMs in an increasing number of European countries, with reciprocity for foreign eurocheque card holders.

### *(b) Credit cards and travel and entertainment cards*

Credit cards and travel and entertainment cards are widely accepted in Belgium. These cards (American Express, Diners Club, Eurocard and VISA) were for a long time the prerogative of an elite minority of Belgians and foreign visitors. But, as a result of vigorous promotion efforts by the companies concerned, the number of cards in circulation has shown a considerable increase: from some 326,000 at end-1985 to around 1,806,000 at end-1992. In 1992, 24.01 million transactions were effected in Belgium for a total of B.fr. 99.62 billion (US$ 3.1 billion), 7.04 million of which were payments by foreign cards (for B.fr. 30.31 billion - US$ 944 million). These cards were joined by the AirPlus card, launched by a group of European airlines and represented in Belgium by SABENA (the Belgian World Airlines company). This card is intended for use in other sectors, not just that of air transport.

A growing number of card issuers have recently begun automating their payment procedures. At some points of sale authorisation takes place electronically on-line, and at the same time details of the transaction are immediately recorded by the issuing company's computer system and a slip evidencing the transaction is automatically printed out.

BCC, the Bank Card Company, of which the financial institutions are the shareholders, accounts for the distribution and the processing of the largest part of VISA cards. Recently the BCC became also responsible for the processing of Eurocard transactions, for reasons of cost savings.

On 1st July 1992 a law[5] went into effect which determinates fixed "liability-tariffs" for the loss of a credit card. Until then a card user was entirely left to the card issuer's goodwill, when a card was lost or stolen. If the loss/theft is reported immediately and no suspect circumstances exist, the victim pays a maximum 6,500 B.fr. (US$ 196). In the case of gross negligence on the part of the cardholder, the financial responsibility for the cardholder mounts to maximal 32,500 B.fr. (US$ 980), for credit cards with a facility up to 65,000 B.fr. (US$ 1,959). For credit cards with a higher credit facility the maximum loss rises to 50% in all cases.

### *(c) Retailers' cards*

Retailers' cards issued by petrol companies and large retailers can, by their nature, only be used at points of sale controlled by their issuers. A distinction can be made between in-house cards meant for the issuers' own infrastructure and those which are, in fact, managed at the operational level by another commercial card issuer (interbank network or credit card issuer). The latter category comprises cards issued by petrol companies. Some of these retailers cards, moreover, are linked with POS terminals, whereas others can only be used "manually". One of the best known cards, issued by a large retailer, can be used either as a debit card (in which case a direct debit of the customer's bank account is initiated by the retailer) or as a credit card, the choice being made by the card holder at the moment on making a purchase.

913,000 cards were in circulation at 31st December 1992; 14.3 million transactions were recorded for a value of B.fr. 27.32 billion (US$ 851 million) ; payments at POS terminals represented 95.6% of the total volume and 94.5% of the overall turnover effected by means of retailers cards.

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5 The Royal Decree of 24th February 1992, based on the law on consumer's credit of 12th June 1991, was published in the Belgian Law Gazette of 4th April 1992.

### *(d) Prepaid cards*

Prepaid cards were launched in Belgium in 1979 with the RTT-Telecard (now called Belgacom-Telecard), which enables national and international telephone calls to be made from public telephone boxes.

In 1992, 7.5 million Telecards were sold; 53% of the public telephone boxes were equipped for Telecard use and 71% of public telephone calls were paid with them. The corresponding figures for 1985 were 1.9 million, 14% and 31%.

Besides the above-mentioned single-purpose card, other service providers, such as city transport companies, make use of similar cards, be it on a smaller scale. Up to now, a multi-purpose card has not been issued.

### *(e) ATM and POS Networks*

Up until 1989 there were two ATM and POS networks: Mister Cash, which had been operational since the end of 1978, and Bancontact, which commenced operations in mid-1979. These two networks merged in 1989, forming an entity called Banksys. This network manages ATM and POS terminals on-line, accessible by means of magnetic stripe cards and secret PIN codes. In addition, there are two ATMs owned by American Express and an in-house Postomat network owned by the Postcheque, which operates only ATMs.

The possible transactions at ATMs are withdrawals, checking of balances (of sight accounts and savings accounts), ordering of documents (cheques, credit transfer forms) and transfers from sight accounts to savings accounts. Each transaction triggers various immediate checks:

- blacklist (stolen cards, etc.);
- balance on current account, on the basis of the balance at the previous day's close, taking into account the total of the day's operations effected by means of the card and the amount of the daily and weekly transactions caps.

At 31st December 1992 1,096 ATMs and 40,627 POS terminals had been installed, mainly by the Banksys network. Of a total of 1,096 ATMs, only 15 had been installed at non-bank sites.

While the POS terminals installed at filling stations and large retail outlets are, like ATMs, heavyweight terminals linked via leased lines to the networks' computer centres, those installed at small retail outlets and in the other sectors are of the "teledataphone" type or "C-ZAM" type, which involve use of the switched telephone network (STN).

The interbank network can be accessed not only by bank debit cards but also by a range of in-house cards issued by petrol companies which can be used exclusively at filling stations selling their brand. These companies make use of the infrastructure of the interbank network, but offer additional advantages such as discounts, the possibility to use the card abroad, etc. These services are specifically aimed at attracting corporate customers with fleets of vehicles.

## *2.2.5 Other payment instruments*

Other instruments are also used in Belgium, the main ones being:

- the luncheon voucher;
- the traveller's cheque; and

- the commercial bill.[6]

The only instrument for which data are available is the luncheon voucher, which theoretically may only be used for the payment of a restaurant bill or for the purchase of food products. These vouchers are issued by two French-owned companies ("Le Chèque-Repas" and "Ticket Restaurant"), and since end-1990 by a subsidiary of a public credit institution (Publichèque), to any other firm wishing to distribute them to its employees as part of their remuneration package.

For reasons of an essentially fiscal nature,[7] use of the luncheon voucher has increased very considerably in the course of the last few years: 130.28 million were issued in 1992 (against 37 million in 1985) for a total value of B.fr. 23.05 billion - US$ 718 million (against B.fr. 6.6 billion - US$ 205 million in 1985).

## 2.3 Recent developments

### *2.3.1 Charging for payment services*

In an increasingly competitive environment, and faced with quite a large number of paper-based transactions in spite of the marked expansion of the Banksys network, the financial system has moved towards charging for payment services offered to holders of sight accounts. The principle of not charging for such services, formerly the standard practice, has been abandoned. A pricing scheme has been adopted for the following services, each institution being free to levy charges:

- the cheque guarantee card issued for a fee set at B.fr. 300 (US$ 9);
- the Bancontact/Mister Cash card issued for a fee of B.fr. 165 (US$ 5);
- foreign transactions subject to a commission.
- account management and mailing of statements of accounts;
- a basic package of forty-eight debit operations, priced at B.fr. 150 (US$ 4.5) plus maximum B.fr. 5 (US$ 0.15) per operation for additional transactions. This package allows a minimum of transactions for a limited amount and aims to maintain access to payment services for everyone.

Pricing decisions are made individually by each institution, though they remain subject to the advice of the Pricing Commission and require the authorisation of the Minister of Economic Affairs.[8]

The objective of charging for payment services is twofold: to reduce the net costs of processing "traditional" payment media and to encourage consumers to make still greater use of electronic payment systems, in which considerable sums have been invested. Most of the financial institutions are actually charging their payment services, though there are some exceptions, mostly small banks, which do not apply the principle of charging for competitive reasons. Charging has largely achieved its objective; the use of small-value cheques dropped by 21% in comparison with 1991, in favour of POS-transactions which increased by 23%.

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6 It is arguable that the commercial bill and its variants are not payment instruments as such because settlement of the transaction underlying the bill has to be in the form of another payment medium (cash or deposit money). The commercial bill can, however, be passed to a third party by means of endorsement.

7 The tax advantages accruing to the employer and the employee under the luncheon voucher system have, however, been progressively reduced recently.

8 The price monitoring system will be abolished for most economic sectors, including banking services, as from 1st May 1993 onwards.

### *2.3.2 The growth of electronic payments*

Data exchange between the financial institutions and their customers has been facilitated by the use of EDI (Electronic Data Interchange). Some banks have started to offer FEDI (Financial EDI), which permits companies to handle their international commercial transactions as well as their banking transactions within the same network.

Telebanking came into operation in Belgium at the end of the 1970s with the automation of payment orders and the transmission of abstracts of accounts and other information, recently also with home banking. Information is exchanged in these processes either by means of file transfers of standing orders, credit transfers, direct debit orders and cheques or by means of on-line interactive input of orders. These developments have been made easier thanks to the existing national standards, which are based on structured information for the different payment media. The most widely used networks are the telephone network and the Data Communication Service network. The use of videotex, allowing access to several service providers (including financial institutions), has not been widely developed in Belgium.

Home banking is specifically aimed at private customers and small enterprises and is generally free of charge. Communication links are based upon push-button telephones, or modem-equipped personal computers. Around a dozen financial institutions have now introduced a phone banking service aimed at individuals equipped with a push-button phone. With the exception of one institution, the banks make no additional charge. The customer pays only the cost of the call. The number of individuals connected to a phone banking system is estimated by various sources at the end of 1992 at 790,000. During 1992 2,500,000 credit transfers were executed by means of phonebanking.

A rather new phenomenon is self-banking. In view of the operating costs of traditional bank branches and since the public has become increasingly accustomed to using electronic keypads, Belgium too has seen the growth of self-service bank counters. Self-banking units offer a wide range of services to the clients, such as the delivery of the statement of account, payments and withdrawals, ordering of credit forms and cheques. Some banks even offer the possibility to exchange foreign currencies or to make income tax calculations. At end-1992 1,808 branches of credit institutions were equipped with a self-banking unit; this is 17.5% of all branches.

## 3. INTERBANK EXCHANGE AND SETTLEMENT SERVICES

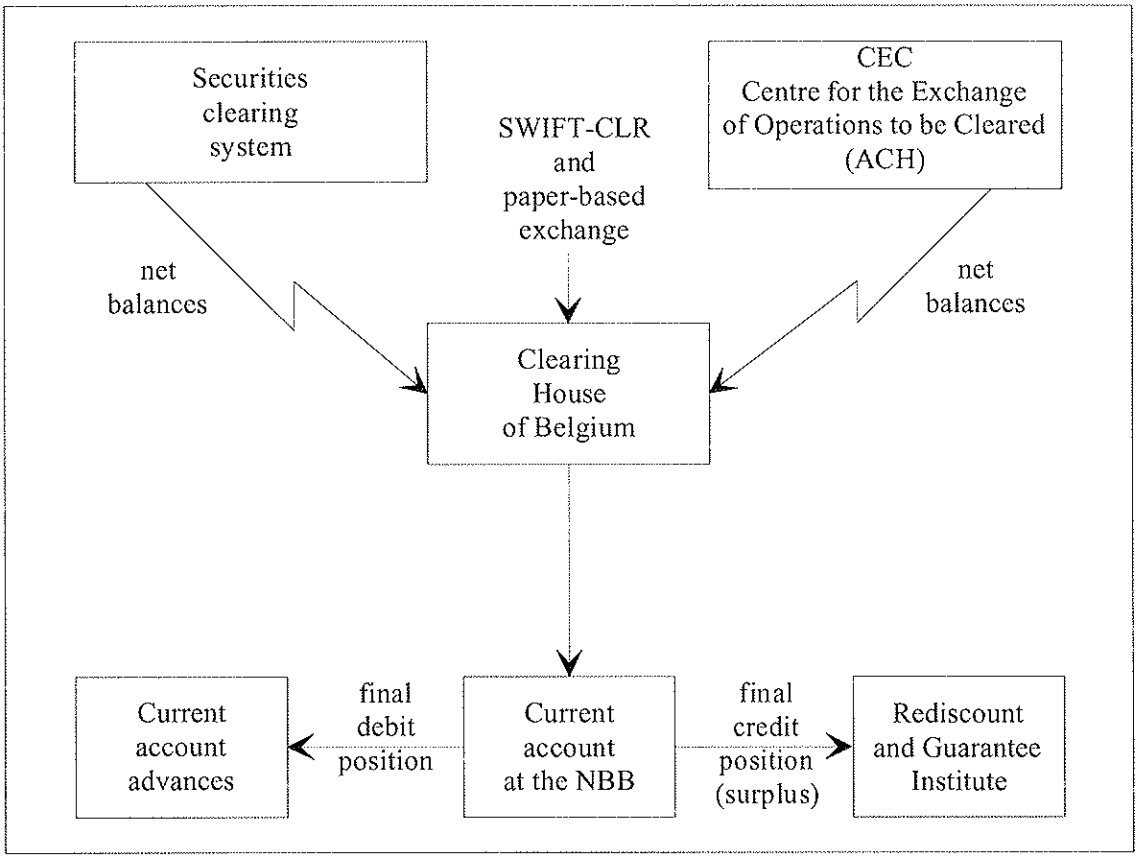
### 3.1 General overview

There are two domestic systems for effecting interbank transfers in Belgium: (i) the Clearing House of Belgium and (ii) the CEC - Centre for the Exchange of operations to be Cleared - an automated clearing house whose net balances are settled at the Clearing House of Belgium.

Of these two transfer mechanisms, neither is dedicated explicitly to the processing of large-value transfers.

The Clearing House of Belgium, which operates from Brussels as well as from eighteen other cities in Belgium, was traditionally a paper-based clearing house, but it now also incorporates the net balances of the Securities Clearing System and the global amounts of the SWIFT-CLR system (see Section 4.1). This, together with the fact that it is still the most important system for large-value transfers, makes that 93.2% of the value exchanged, concentrated in only 3.4% of the cleared transactions, passes through this Clearing House. The CEC - the balances of which are also settled through the Clearing House - mainly processes small-value transfers: 96.6% of the transfers are cleared via CEC, representing only 6.8% of the value.

Chart 1
**Interbank exchange and settlement systems in Belgium**




## 3.2 Structure, operation and administration

### *3.2.1 Major legislation, regulations and policies*

There is very little specific legislation in the field of interbank payments. The financial institutions themselves determine the by-laws and rules governing the Clearing House of Belgium and the CEC.

The Clearing House of Belgium (an association without specific legal structure) is governed by a board of directors composed of representatives of the most important member institutions. Most of the rules are determined solely by this board, though some of them also require the approval of the general assembly.

The CEC is a non-profit-making organisation. As in the case of the Clearing House, the board of directors takes most of the decisions on new rules.

The National Bank of Belgium acts as Chairman and operational manager of the two clearing mechanisms mentioned above. Although the National Bank of Belgium cannot impose decisions, it plays an important part in its traditional role as Chairman, in safeguarding the smooth functioning of the systems.

### *3.2.2 Participants in the systems*

Membership of the Clearing House of Belgium is granted by a decision of its general assembly. There are no restrictions, according to its by-laws, for foreign applicants. In practice, the Postcheque and all credit institutions that legally act in Belgium can participate. There are no separate criteria for direct and indirect participation; in the latter case, the financial institution chooses for practical reasons to be represented in the Clearing House by another financial institution. Each direct participant is held responsible for the transactions of those indirect participants which it represents. At the end of 1992 the Clearing House of Belgium had 71 direct participants and 76 indirect participants.[9]

The statutory criteria for participation in the CEC are very similar to those applied as a general rule for the Clearing House. On 31st December 1992 the CEC counted 129 participants, of which 53 receive data only by means of facsimile.

### *3.2.3 Types of transactions handled*

At the Clearing House of Belgium, all types of paper-based payment instruments can be handled: cheques, credit transfers, commercial bills, redemptions of securities and coupon payments, liabilities incurred in Belgian francs in respect of foreign exchange transactions (see also Section 4.1).

The CEC is used mainly for exchanging data on retail payments and interbank operations. These include credit transfers, "truncated" cheques up to B.fr. 300,000 (US$ 9,042), unpaid cheques, ATM/POS transactions and direct debits (see Tables 8 and 9 in the statistical annex). A special CEC application that was initially created for large-value transactions with a minimum amount of B.fr. 5 million (US$ 0.15 million), has been transformed in October 1992 into a "large or urgent credit transfer" application, without a minimum amount.[10] However, each institution has to restrict the number of operations it transmits in this application. Ordinary credits should be exchanged through the usual application for credit transfers. These payments are processed according to a specific time schedule. The special application also incorporates some technical differences, as compared with the other CEC applications, such as the obligatory use of telecommunication, encryption, etc.

The Postcheque and three major financial institutions provide nearly 60% of the number of transactions processed in the systems.

### *3.2.4 Operation of the transfer systems*

The Clearing House of Belgium handles paper-based transfer orders within the various branches of the Clearing House and between the branches (by mail or courier service). Balances resulting from the CEC and from the Securities Clearing System of the National Bank of Belgium are automatically added in the afternoon, after which multilateral net balances are calculated. Payments become final the same day.

An overview of the cut-off times for transactions presented at the Clearing House of Belgium is given below:

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9 One public credit institution and its fourteen local cooperative institutions are counted as one financial institution but as fifteen different participants in the Clearing House.

10 However, the minimum amount of B.fr. 5,000,000 remains applicable to all payments sent to the Postcheque, except those related to social security contributions and taxes.

| Operations | Cut-off time |
|---|---|
| Paper-based securities and coupons | 09.00 |
| Cheques | 11.45 |
| Credit transfers | 13.00 |
| CEC - balances (details in next table) | 14.00 |
| Debits, rectifications | 14.15 |
| Unpaid cheques, specific credit transfers | 14.30 |
| Operations centralised outside Brussels | 15.30 |
| Balances resulting from securities clearing | 16.00 |
| Final settlement | 16.30 |

Revocation of operations is not possible, unless bilaterally agreed. Participants with a positive net final balance are able to transfer this balance to the Rediscount and Guarantee Institute (HWI-IRG), a semi-official market-maker in discount bills. Those with a negative net final balance can borrow from the National Bank of Belgium on a fully collateralised basis (for more details, see Section 5.3).

The CEC transfer system operates on a round-the-clock basis, five days a week. Data are sent to the CEC by the participants by telecommunication, tapes, cassettes or diskettes. Exchange of paper payment documents (including cheques) does not occur, as they are "truncated" and retained by the institution which receives them from the customer. Encryption is obligatory for telecommunication transfers in the "large-value" application and will be extended to all telecommunication transfers from 1st April 1994. The participants may inquire about their position by telecommunication throughout the day. They cannot revoke their operations.

| Operations | Cut-off time for settlement on Day D | |
|---|---|---|
| | Teleprocessing-users | Others |
| Direct debits | D : 08.00 | D - 1 : 22.00 |
| Credit transfers | D : 12.30 | D : 10.00 |
| Large-value or urgent | | |
| Credit transfers | D : 13.30 | not allowed |
| Cheques | D : 13.45 | D : 13.00 |

At 14.00 the multilateral net balances of the CEC are communicated to the Clearing House of Belgium. Exchange of data extends beyond this deadline, but such transactions are settled on the next value date.

### *3.2.5 Transaction-processing environment*

Until recently, the Clearing House of Belgium was a fully manual paper-based operation. Since March 1992 an automation project has been implemented. Paper-based payment documents continue to be exchanged but the data on the operations are announced on terminals, either in the Clearing House or in the head offices of member banks. Operations are electronically confirmed by the addressee after having received the payment documents. The National Bank of Belgium exercises a controlling function and closes the clearing at the end of the day, when all operations have been confirmed and when the provincial clearing houses have communicated their definitive situation. The advantages of this system are, amongst others, that members can observe their treasury positions on-line and that the net balances of the CEC and the Securities Clearing System can be entered automatically.

Data exchange between the CEC and its members happens through magnetic media or by telecommunication; 72% of input data and 61% of output data are currently handled via teleprocessing. The CEC operates with a very high degree of reliability, up to 99.99%. Immediate backup facilities exist both within the National Bank of Belgium as well as in a backup centre provided by a computer firm.

### *3.2.6 Settlement procedures*

The National Bank of Belgium is the only settlement agent. For all clearing mechanisms, finality occurs at the end of the day, when the multilateral netted positions of the participants are entered in their settlement accounts at the National Bank of Belgium. Should a participant have a net debit position which exceeds its credit facility with the National Bank of Belgium and should it also be unable to borrow from other credit institutions, all of its payments would have to be "unwound" (see also Section 5.3).

### *3.2.7 Pricing policies*

The cost of the Clearing House of Belgium is partially borne by the National Bank of Belgium. The costs of the computer application, of the courier service and some small costs are recouped from the participants. There are no transaction fees.

The cost of the CEC system is shared between its members, essentially on the basis of transaction volumes, so that the National Bank of Belgium's operating and capital costs are fully covered. The price of a transaction is presently B.fr. 0.234 (VAT not included) (US$ 0.0071). In addition to these system costs, an interbank pricing system exists through which every receiving bank pays a certain sum to compensate for the remitter's data capture cost. At present, these prices average out at B.fr. 5.5 (US$ 0.17).

### *3.2.8 Credit and liquidity risks*

Each participant[11] must have a settlement account at the National Bank of Belgium. Overnight credit extended by the National Bank of Belgium has to be fully covered by collateral.

There are no intraday arrangements or intraday controls on net debit balances. Loss-sharing rules do not exist. The "unwinding" of all operations of a defaulting bank is the ultimate solution in the event of serious problems at the end of the day.[12] This never happened as considerable

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11 With the exception of the Postcheque Office, the net balances of which are incorporated in the accounts of the State's Cashier.

12 This would remain so as long as the Regulations of the Clearing House have not been adapted in line with art. 157 of the law on the status and supervision of credit institutions (see Section 1.1).

mutual confidence among the participants made it possible to find solutions in those rare cases where, due to miscalculations or technical problems, one of the participants incurred problems. Nevertheless, there is a growing awareness of the presence of credit, liquidity and systemic risks, and the National Bank has launched a plan to limit them (see Section 5.4).

## 4. SPECIAL USE OF INTERBANK TRANSFER SYSTEMS FOR INTERNATIONAL AND DOMESTIC FINANCIAL TRANSACTIONS

### 4.1 Exchange and settlement systems for international transactions

International payments are effected through traditional correspondent banking channels. There are no exchange control regulations in existence which have an effect on payments.

Instructions for payments in Belgian francs, originating from foreign bankers, are transmitted via different networks:

- S.W.I.F.T.: a minority of S.W.I.F.T. orders are submitted individually and in paper-based form at the Clearing House of Belgium; fifteen major financial institutions, however, are connected to the S.W.I.F.T.-CLR (clearing) system which provides for the calculation of the global amounts to be settled at the Clearing House, while the individual payment instructions are transmitted electronically;
- other systems like Tipa (see also chapter on cross-border payment system arrangements) are mainly used for low-value payments; these transactions are entered in the CEC by the Belgian correspondent bank participating in these systems.

Nearly all banks which undertake correspondent business in Belgian francs are direct members of the Clearing House. There is no automated settlement system for international Belgian franc-denominated transactions, nor is there a specific large-value settlement system (see above). Correspondent banking business tends to be concentrated among a limited number of commercial banks. The three largest commercial banks probably account for most of the business and one of them is participating in the ECHO-netting project (see also chapter on cross-border payment system arrangements).

In the context of international payments made face-to-face, the most commonly used payment instruments are eurocheques, credit cards, debit cards, banknotes and travellers' cheques. No data are available on the use of banknotes and travellers' cheques.

| **Payment instruments 1992** | **Transactions abroad by Belgians** | | | **Transactions in Belgium by foreigners** | | |
|---|---|---|---|---|---|---|
| | **number (millions)** | **value (BEF billions)** | **value (USD millions)** | **number (millions)** | **value (BEF billions)** | **value (USD millions)** |
| Eurocheques ..... | 3.10 | 15.70 | 489 | 1.70 | 7.10 | 221 |
| Credit cards ..... | 12.35 | 48.01 | 1495 | 7.04 | 30.31 | 944 |
| Debit cards at ATMs | 0.60 | 2.57 | 80 | 0.53 | 2.01 | 63 |

## 4.2 Exchange and settlement systems for securities transactions

There exists in Belgium a clearing system, mainly for government-issued securities, called the Securities Clearing System of the National Bank of Belgium, and a depository for the exchange of all kinds of securities, called CIK.[13] Furthermore, Euroclear is located in Belgium (see also chapter on cross-border payment system arrangements).

### *4.2.1 The Securities Clearing System of the National Bank of Belgium*

In January 1991, the National Bank of Belgium launched a Securities Clearing System for dematerialised Treasury certificates and linear bonds (OLOs[14]). Since October 1991 commercial paper and certificates of deposit in book-entry form have also been handled by the system, as have over-the-counter transactions in standard government securities since January 1992.

An extension of the Securities Clearing System to ECU-denominated securities will be operational when the first such instrument is issued by the Belgian Government.

The Clearing System is based on five main principles:

- book entry (the National Bank of Belgium acts as central depository);
- double notification of the transactions (matching);
- delivery versus payment;
- automatic bond lending facilities;
- multilateral net settlement (for both the cash and securities legs of the transactions).

All financial institutions and stockbroking companies established in Belgium or Luxembourg may become direct participants in the securities clearing house, provided they subscribe to the membership-agreement. Other participants are the Treasury and the National Bank of Belgium itself. Institutions such as CIK (see Section 4.2.2), Cedel and Euroclear are allowed to participate, but only on behalf of their foreign customers. A system of sub-participation (being represented by another participant) also exists.

Notifications are received all day and can be communicated by S.W.I.F.T. or telefax (in the latter case authenticity and integrity of messages are guaranteed by the Trasec[15] system). Inputs of notifications with due-date on the same day are possible until 15.00. Final settlement is initiated at 15.30: the Securities Clearing System determines the balance of each participant in each kind of security on each securities account and centralises all cash transactions in order to determine one single cash balance for each participant.

Participants whose securities accounts have debit balances can borrow, via an automatic bond lending system, from a "pool" which is provided by those participants and their clients who have securities in their portfolios that they do not have to dispose of immediately. Market operators wishing to join this system have to enter into an agreement with the National Bank of Belgium, which manages the Securities Clearing System. Only those participants which have joined the consortium of lenders are given the right to borrow. Bond lending has to be covered by collateral and is automatically effected without any intervention of lenders or borrowers; consequently notifications are not needed. Bond lending is anonymous in the interests of confidentiality.

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13 CIK: an acronym for Caisse Interprofessionnelle de dépôts et de virements de titres - Interprofessionele Effectendeposito- en GiroKas.

14 OLOs: Linear Bonds, i.e. long-term bonds with fixed rate, term and repayment value, issued by monthly portions via a system of auctions.

15 Trasec: Transmission Security is a system protecting the integrity of data transfers and providing authentication.

Cash balances are notified by the Securities Clearing System to the Clearing House of Belgium (for participants which are members of the clearing house) and to the National Bank of Belgium's Current Account Division (for other participants such as stockbrokers and Luxembourg participants). After the close of the Clearing House, balances are settled; computer files are updated and securities accounts are debited and credited.

#### *4.2.2 The Securities Deposit and Clearing Office of the Financial Sector (CIK)*

The CIK is a limited liability company, established according to the terms of the Royal decree No. 62 of 10th November 1967, and owned by the financial community. Credit institutions, stockbrokers and similar foreign institutions may become members. The CIK aims to ensure the circulation of Belgian and foreign securities by means of transfer between securities accounts opened in the name of the depositors of those securities. The CIK does not intervene, however, in the settlement of the underlying transactions. It can therefore be considered as a depository and exchange house for securities, but not as a settlement system.

Settlement of stock market transactions and some other transactions at the CIK is effected by order of the Clearing Centre for Operations of the Brussels Stock Exchange (CCC: "Caisse de Compensation du Comptant près de la Bourse de Bruxelles" - "Vereffeningskas van de Kontantverrichtingen bij de Beurs van Brussel") through the current account system of the National Bank of Belgium. The CCC calculates participants' multilateral net positions and sends these to the National Bank of Belgium, where only one debit or credit per stockbroker has to be registered to their respective current accounts. Only when sufficient financial provision is available do the corresponding securities transfers in the book-entry system of the CIK become effective.

## 5. THE ROLE OF THE CENTRAL BANK IN INTERBANK SETTLEMENT SYSTEMS

### 5.1 General responsibilities

The National Bank of Belgium is governed by an organic law and by its statutes.

Article 30 bis of the organic law mentions "the promotion of the smooth operation of payment systems" as one of its tasks. Also the following paragraphs of the statutes are relevant to payment and settlement services offered by the Bank:

- Article 17, 2° allows the central bank to make current account advances and short-term loans, guaranteed by the pledging of commercial bills or loan instruments, listed on a stock exchange or traded in money or capital markets;
- Article 17, 3° allows the central bank to receive deposits of sums and establish such deposits with credit institutions and the Rediscount and Guarantee Institute;
- Article 18, 1st paragraph: "the Bank may carry out all transactions and render all services which are ancillary to or follow from its functions";
- Article 31: "the Bank may carry out all operations designed to facilitate transfers of funds".

The internal audit department of the National Bank of Belgium concerns itself with the different clearing systems (Clearing House of Belgium, CEC and Securities Clearing System) to the extent that the National Bank of Belgium is de facto responsible for the operational organisation of these systems.

### 5.2 Provision of settlement and credit facilities

The National Bank of Belgium currently provides:

- settlement accounts for all members of the Clearing House;
- an overdraft facility for all settlement accounts if covered by collateral;
- accounts for other financial institutions (e.g. sub-members of the Clearing House and Luxembourg banks) with overdraft facilities if covered by collateral;
- accounts for all stockbrokers which are members of the Stock Exchange, some of which participate in the Securities Clearing System, mentioned under Section 4.2.1;
- sight accounts - without overdraft facility - for international institutions, foreign central banks and foreign private banks;
- accounts with developing countries under the terms of financial assistance agreements.

Though the legal framework exists, financial institutions in Belgium are not at present subject to monetary reserve requirements; they hold practically no balances on their accounts at the central bank.

By virtue of the law of 2nd January 1991, the National Bank of Belgium was entrusted with the task of organising a dematerialised securities clearing system. In its capacity as neutral manager, the National Bank of Belgium handles day-to-day operations on behalf of the CEC and the Clearing House of Belgium.

The Clearing House of Belgium, the CEC and the Securities Clearing System are all physically located at the National Bank of Belgium. They are operated on the Bank's computer system by the Bank's own personnel.

The level of charges set by the Bank for the services it offers is determined, inter alia, by a desire to cover the cost of those services. This, however, is by no means a requirement. If price competition with a private sector supplier of a comparable service was to ensue as a result, that would be acceptable, but not intentional.

The National Bank of Belgium offers end-of-day credit facilities to Belgian and Luxembourg financial institutions, as described below. There is no system for explicit intraday credit.

### 5.3 Monetary policy and payment systems

The principal objective of the NBB's monetary policy is price and exchange rate stability. It is mainly guided by an exchange rate target which consists of keeping the franc firmly pegged to the Deutsche Mark.

By announcing its official rates, the Bank gives clear indications of the desired movement of short-term interest rates. The discount rate and the rate for collateralised current account advances "above the ceiling" (i.e. in excess of the credit line) thus perform a signalling function (see below). It is, however, mainly through the conditions applicable to the end-of-day facilities and by the so-called "central rate", i.e. the rate of the periodic allocations of credit by tender, that the Bank makes clear the orientation of its interest rate policy.

To cover the need for liquidity and bring the overall market position to the desired level of surplus or deficit, the National Bank of Belgium will act in two ways. First, it will correct certain autonomous contracting or expanding influences from the money market itself, e.g. seasonal or sudden increases and decreases in the demand for banknotes or fluctuations due to the Bank's activity on the foreign exchange market. Second, the Bank will daily adjust the market liquidity by direct "steering" interventions.

To provide the financial intermediaries with a basic, structural liquidity supply, a system of periodic allocations of credit by tender is organised. At the participants' choice, these credits can be secured by guarantees taking the form of pledging of public securities or of cessions-retrocessions of commercial bills. Next to these tender credits, the credit institutions have a ceiled cession-retrocession facility for the mobilisation of commercial bills at the discount rate.

To "fine-tune" market liquidity, outright open market operations, repurchase agreements, foreign currency swaps and classical interbank operations may be used by the Bank on a daily basis.

The instruments for regulating money market liquidity are supplemented by an arrangement for covering any deficits and using surpluses with which the various financial intermediaries may end the day.

To cover their residual deficits, Belgian and Luxembourg financial intermediaries can have recourse to the central bank's current account advances, for which they have been granted generous individual credit lines. Each financial intermediary may fix the usable amount of its available credit as it wishes, by providing collateral. This collateral must consist of securities denominated in Belgian or Luxembourg francs which are tradable on the stock exchange or on the money and capital markets and are issued or guaranteed by the Belgian or Luxembourg Government or issued by international financial institutions of which Belgium or Luxembourg are members. Credit is granted up to 95% of the market value of the provided collateral.

These daily end-of-day loans take the form of current account advances, with interest payable daily. The interest rate on these advances is announced by the National Bank of Belgium in advance but can be adjusted every day if necessary. It is fixed at a level above the central rate. In view of the specific liquidity risks connected with the activities of the primary dealers,[16] this higher interest rate is not applicable to part of their end-of-day deficits, which they can meet at the central rate used by the central bank.

Advances "above the ceiling" can be granted if sufficient collateral is present, but at a much higher interest rate.

Financial intermediaries can place any cash surpluses they are left with after the close of the Clearing House on deposits, remunerated at a rate below the market rate. These deposits cannot, however, be made directly with the central bank but are accepted by the Rediscount and Guarantee Institute, which reinvests them with the National Bank of Belgium. The applied rate is slightly below the central rate for surpluses not exceeding 5% of the individual credit line and generally much lower for amounts exceeding it. Here again, the primary market dealers can deposit part of their residual cash surpluses on central rate terms.

### 5.4 Risk reduction measures

The development of a new current accounts application, which was planned for 1992, seemed to be the appropriate moment to consider more generally the challenges for the Belgian payment systems in the coming decade. These challenges are related to the increasing volume of payments, the growing awareness of the risks related to payment systems, the advanced technological possibilities and the concern to cut down the costs.

These considerations resulted in an "Action plan" for the Cashless Payments Service. The plan implies four measures to be taken. Beside the above-mentioned new computerisation of the current accounts, the NBB proposes to implement a real-time gross settlement system, in which every payment instruction is checked on provision. On this proposal, discussions with the banking sector have recently started. A third objective is to attain to a 100% automation rate, excluding, within five to ten years, the manual exchange of paper-based payment instruments. With that intention, the use of

16 Financial intermediaries, selected by the Minister of Finance, which have undertaken to promote, as market-makers, the secondary market for linear bonds and Treasury certificates.

the CEC will be stimulated and the creation of new applications in or besides the CEC will be needed. Paper-based operations might be discouraged by tarification. Fourth and finally, a further generalisation of teleprocessing use in the CEC is aimed for.

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Table 1

**Basic statistical data**

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Population (millions) ..... | 9.93 | 9.95 | 9.99 | 10.02 | 10.07 |
| GDP (BEF billions) ..... | 5,571 | 6,053 | 6,426 | 6,723 | 7,034 |
| GDP per capita (BEF) ..... | 561,027 | 608,341 | 643,243 | 670,958 | 698,510 |
| Exchange rate (domestic currency vis-à-vis USD): | | | | | |
| *year-end* ..... | *37.35* | *35.76* | *30.98* | *31.27* | *33.18* |
| *average* ..... | *36.81* | *39.43* | *33.41* | *34.18* | *32.12* |

Table 2

**Settlement media used by non-banks**

(at year-end, not seasonally adjusted, in billions of Belgian francs)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Notes and coin ..... | 415.6 | 421.7 | 413.2 | 417.0 | 414.1 |
| Transferable deposits[1] ..... | 779.9 | 876.9 | 905.4 | 917.6 | 902.0 |
| Other ..... | - | - | - | - | - |
| Narrow money supply ..... | 1,195.7 | 1,298.6 | 1,318.6 | 1,334.6 | 1,316.1 |
| *Memorandum item:* | | | | | |
| Broad money supply ... | 4,552.2 | 5,150.5 | 5,381.3 | 5,690.8 | 6,061.2 |

[1] Sight deposits in BEF of companies and private persons held with the Postcheque Office, commercial banks, savings banks and public credit institutions.

Table 3

**Settlement media used by banks**

(in billions of Belgian francs)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Reserve balances held at central bank[1] ..... | . | . | . | 4.05 | 2.09 |
| Transferable deposits at other institutions[2] ..... | 298.4 | 310.9 | 415.9 | 452.4 | 504.4 |
| Other ..... | - | - | - | - | - |
| *Memorandum items:* | | | | | |
| Required reserves ..... | - | - | - | - | - |
| Institutions' borrowing from central bank[1,3] .... | . | . | . | 3.31 | 3.74 |

[1] Average of end-of-month figures. [2] Average of end-of-quarter figures. [3] Current account advances.

Table 4

**Banknotes and coin**

(at year-end, not seasonally adjusted, in billions of Belgian francs)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Total banknotes and coin outstanding | 445.8 | 459.4 | 446.3 | 450.1 | 448.1 |
| Denominations: | | | | | |
| *Notes:* | | | | | |
| *10,000[1] francs* | - | - | - | - | *15.3* |
| *5,000 francs* | *298.9* | *305.0* | *295.8* | *297.8* | *279.1* |
| *1,000 francs* | *106.8* | *111.9* | *106.8* | *107.3* | *109.1* |
| *500 francs* | *11.6* | *12.1* | *12.2* | *12.4* | *12.6* |
| *100 francs* | *13.1* | *13.6* | *13.7* | *14.0* | *14.1* |
| *50 francs* | *1.4* | *0.6* | - | - | - |
| *Coin:* | | | | | |
| *500 francs* | *1.0* | *1.0* | *1.1* | *1.1* | *0.2* |
| *50 francs* | *3.0* | *4.7* | *5.9* | *6.5* | *7.1* |
| *20 francs* | *5.9* | *6.4* | *6.5* | *6.6* | *6.7* |
| *5 francs* | *2.2* | *2.2* | *2.3* | *2.4* | *2.5* |
| *1 francs* | *1.6* | *1.6* | *1.7* | *1.7* | *1.1* |
| *0.5 francs* | *0.3* | *0.3* | *0.3* | *0.3* | *0.3* |
| Banknotes and coin held by credit institutions | 30.2 | 37.7 | 33.1 | 33.1 | 34.0 |
| Total banknotes and coin outside credit institutions | 415.6 | 421.7 | 413.2 | 417.0 | 414.1 |

[1] Notes with a denomination of BEF 10,000 have only been issued since 11th December 1992.

Table 5

**Institutional framework**

(at end-1992)

| Categories | Number of institutions | Number of branches | Number of accounts (thousands) | Value of accounts (BEF billions) |
|---|---|---|---|---|
| Central bank ..... | 1 | 18[1] | | |
| Commercial banks[2] ..... | 94 | 3,515[3] | 3,839 | 579.1 |
| Savings banks ..... | 28 | 3,748[4] | 1,641 | 82.2 |
| Public credit institutions ..... | 6 | 3,080[5] | 3,148 | 163.1 |
| Postcheque ..... | 1 | 2,164 | 1,185 | 77.5 |
| *Memorandum item:* | | | | |
| Branches of foreign banks[6] ..... | 39 | | | |

[1] Five of the 23 branches became representation offices, in which no transactions with credit institutions take place. [2] Branches of foreign banks included. [3] 155 non-full-size branches excluded. [4] 6,670 non-full-size branches excluded. [5] 927 non-full-size branches excluded. [6] 38 commercial banks and one savings bank.

Table 6

**Cash dispensers, ATMs and EFTPOS terminals**

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Cash dispensers and ATMs: | | | | | |
| *Number of networks* ..... | *4* | *3* | *3* | *3* | *3* |
| *Number of machines* ..... | *844* | *913* | *939* | *1,052* | *1,096* |
| *Volume of transactions (millions)* ..... | *56.65* | *67.89* | *70.86* | *80.79* | *88.33* |
| *Value of transactions (BEF billions)* ..... | *199.69* | *228.63* | *248.52* | *296.71* | *331.67* |
| EFTPOS: | | | | | |
| *Number of networks* ..... | *6* | *5* | *5* | *6* | *6* |
| *Number of terminals* ..... | *19,118* | *24,644* | *28,253* | *32,199* | *40,627* |
| *Volume of transactions (millions)* ..... | *52.45* | *66.50* | *79.04* | *98.76* | *120.74* |
| *Value of transactions (BEF billions)* ..... | *68.26* | *100.30* | *135.69* | *178.86* | *231.21* |

Table 7

**Number of payment cards in circulation**

(in thousands)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Cards with a cash function | 5,029 | 5,547 | 6,377 | 6,857 | 7,792 |
| Cards with a debit/credit function[1] | 5,140 | 5,655 | 6,485 | 6,967 | 7,907 |
| *of which:* | | | | | |
| *cards with a debit function* | *4,535* | *4,672* | *5,250* | *5,466* | *6,101* |
| *cards with a credit function*[2] | *605* | *983* | *1,235* | *1,501* | *1,806* |
| Cards with a cheque guarantee function | 4,426 | 4,228 | 4,651 | 4,653 | 4,598 |
| Retailer cards | 690 | 736 | 688 | 767 | 913 |

[1] Overlaps with the cards with a cash function. [2] Most cards with a credit function are of the delayed debit type.

Table 8

**Payment instructions handled by selected payment systems: volume of transactions**

(in millions)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Clearing House | 33.36 | 31.63 | 27.87 | 27.28 | 24.67 |
| *Securities clearing balances*[1] | - | - | - | *0.00* | *0.00* |
| *Postal drafts* | *3.26* | *3.19* | *2.90* | *2.63* | *2.21* |
| *FX transactions*[2] | *0.09* | *0.06* | *0.07* | *0.03* | *0.46* |
| *Debits* | *7.90* | *6.50* | *5.87* | *6.22* | *5.55* |
| *Ordinary credits* | *3.21* | *3.98* | *3.86* | *3.88* | *3.35* |
| *Bilaterally exchanged credits* | *9.32* | *8.89* | *6.92* | *7.61* | *7.65* |
| *Province* | *9.53* | *8.96* | *8.21* | *6.90* | *5.45* |
| *Others* | *0.05* | *0.05* | *0.04* | *0.01* | *0.00* |
| CEC | 499.94 | 549.65 | 610.33 | 652.12 | 695.20 |
| *Direct debits* | *33.31* | *39.10* | *45.32* | *50.76* | *56.53* |
| *Truncated cheques* | *115.23* | *113.53* | *114.88* | *110.43* | *99.12* |
| *ATMs and POS* | *98.28* | *120.98* | *145.19* | *164.92* | *191.31* |
| *Credit transfers* | *253.12* | *276.04* | *304.93* | *325.94* | *348.08* |
| *Large-value transfers* | - | - | *0.01* | *0.07* | *0.16* |

[1] Negligible quantity. [2] The break in series is due to a more detailed breakdown of the related credit transfers.

Table 9

**Payment instructions handled by selected payment systems: value of transactions**

(in billions of Belgian francs)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Clearing House | 135,349 | 164,687 | 181,193 | 187,000 | 203,067 |
| *Securities clearing balances*[1] | - | - | - | *5,255* | *5,531* |
| *Postal drafts* | *69* | *63* | *41* | *39* | *43* |
| *FX transactions*[2] | *15,265* | *16,224* | *14,037* | *11,841* | *21,970* |
| *Debits* | *10,045* | *11,858* | *20,820* | *18,465* | *18,482* |
| *Ordinary credits* | *85,210* | *102,160* | *115,828* | *137,951* | *149,278* |
| *Bilaterally exchanged credits* | . | *209* | *162* | *295* | *250* |
| *Province* | *8,910* | *9,264* | *9,451* | *5,833* | *6,518* |
| *Others* | *15,850* | *24,909* | *20,854* | *7,321* | *995* |
| CEC | 7,200 | 8,125 | 9,529 | 12,334 | 15,928 |
| *Direct debits* | *186* | *218* | *259* | *300* | *341* |
| *Truncated cheques* | *1,074* | *1,108* | *1,161* | *1,170* | *1,158* |
| *ATMs and POS* | *256* | *319* | *387* | *455* | *541* |
| *Credit transfers* | *5,684* | *6,480* | *7,474* | *8,298* | *9,322* |
| *Large-value transfers* | - | - | *248* | *2,111* | *4,566* |

[1] In January 1991 the NBB launched a securities clearing system for dematerialised Treasury certificates and linear bonds. [2] The break in series is due to a more detailed breakdown of the related credit transfers.

Table 10

**Transfer instructions handled by securities settlement systems: volume of transactions**

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| NBB Clearing:[1] | | | | | |
| *Treasury certificates* | - | - | - | *14,435* | *19,430* |
| *Linear bonds* | - | - | - | *38,914* | *60,857* |
| CiK: | | | | | |
| *Equity transactions (millions)*[2] | *207.7* | *277.6* | *269.3* | *260.8* | *253.1* |

[1] In January 1991 the NBB launched a securities clearing system for dematerialised Treasury certificates and linear bonds. [2] The volume of equity transactions refers to the number of shares traded; the number of actual transactions is estimated at about 750,000.

Table 11

**Transfer instructions handled by securities settlement systems: value of transactions**

(in billions of Belgian francs)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| NBB Clearing:[1] | | | | | |
| *Treasury certificates* | - | - | - | *6,999* | *9,694* |
| *Linear bonds* ..... | - | - | - | *3,990* | *8,567* |
| CiK: | | | | | |
| *Equity transactions* ..... | *395.6* | *418.0* | *319.2* | *290.0* | *315.6* |

[1] In January 1991 the NBB launched a securities clearing system for dematerialised Treasury certificates and linear bonds.

Table 12

**Indicators of use of various cashless payment instruments: volume of transactions**

(in millions)

| Instruments | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Cheques issued ..... | 244.5 | 230.5 | 206.6 | 193.8 | 174.2 |
| Payments by debit and credit cards ..... | 61.9 | 78.7 | 95.5 | 119.3 | 144.7 |
| Paper-based credit transfers ..... | 5.5 | 6.0 | 5.6 | 5.2 | 4.6 |
| Paperless credit transfers | 420.6 | 460.6 | 495.9 | 506.6 | 524.0 |
| Direct debits[1] ..... | 54.9 | 57.3 | 65.9 | 73.2 | 81.3 |
| Other ..... | - | - | - | - | - |
| **Total** ..... | 787.4 | 833.1 | 869.5 | 898.1 | 928.8 |

[1] Revised figures.

Table 13

**Indicators of use of various cashless payment instruments: value of transactions**

(in billions of Belgian francs)

| Instruments | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Cheques issued | 13,134 | 13,713 | 12,179 | 9,937 | 12,460 |
| Payments by debit and credit cards | 109 | 153 | 205 | 262 | 331 |
| Paper-based credit transfers | 91,485 | 108,841 | 122,389 | 141,592 | 153,511 |
| Paperless credit transfers[1] | 21,598 | 24,625 | 27,654 | 32,808 | 35,284 |
| Direct debits[1] | 306 | 317 | 374 | 430 | 485 |
| Other | - | - | - | - | - |
| **Total** | 126,632 | 147,649 | 162,801 | 185,029 | 202,071 |

[1] Revised figures.

Table 14

**Participation in S.W.I.F.T. by domestic institutions**

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Members | 31 | 32 | 33 | 36 | 35 |
| *of which: live* | *30* | *32* | *32* | *33* | *35* |
| Sub-members[1] | 28 | 26 | 28 | 35 | 39 |
| *of which: live* | *27* | *25* | *25* | *28* | *32* |
| Participants[2] | 1 | 1 | 2 | 1 | 2 |
| *of which: live* | *0* | *1* | *2* | *1* | *1* |
| Total users | 60 | 59 | 63 | 66 | 76 |
| *of which: live* | *57* | *58* | *59* | *62* | *68* |
| *Memorandum items:* | | | | | |
| Total S.W.I.F.T.: | | | | | |
| *members* | *1,581* | *1,697* | *1,812* | *1,963* | *2,074* |
| *sub-members* | *1,228* | *1,315* | *1,469* | *1,607* | *1,738* |
| *participants* | *27* | *37* | *63* | *78* | *91* |
| *users* | *2,836* | *3,049* | *3,344* | *3,648* | *3,903* |

[1] Domestic users sponsored by members abroad. [2] Participants are not shareholders in S.W.I.F.T. and their message traffic over the network is restricted.

*Source:* S.W.I.F.T.

Table 15

**S.W.I.F.T. message flows to/from domestic users**

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Total messages sent ..... | 12,915,685 | 14,139,694 | 15,297,042 | 16,567,543 | 18,097,152 |
| *of which:* | | | | | |
| *category I*[1] ..... | *4,716,617* | *5,180,098* | *5,222,108* | *5,347,697* | *5,751,632* |
| *category II*[2] ..... | *3,376,844* | *3,654,675* | *4,187,387* | *4,698,968* | *5,030,069* |
| *of which:* | | | | | |
| *sent/received to/from domestic users* ..... | *2,011,356* | *2,292,087* | *2,355,072* | *2,524,657* | *2,920,427* |
| Total messages received ..... | 10,640,147 | 11,792,454 | 12,619,118 | 13,868,647 | 15,086,640 |
| *of which:* | | | | | |
| *category I*[1] ..... | . | . | . | . | *5,171,658* |
| *category II*[2] ..... | . | . | . | . | *3,596,967* |
| *Memorandum item:* | | | | | |
| Global S.W.I.F.T. traffic .. | 255,142,610 | 298,780,982 | 332,895,932 | 365,159,291 | 405,540,962 |

[1] Category I: customer (funds) transfers. [2] Category II: bank (funds) transfers.

*Source:* S.W.I.F.T.

**Methodology and sources used for the compilation of Tables 12 and 13**

The data include estimates for transactions processed outside the interbank clearing procedure (including "on-us" items). These are obtained from a survey carried out by the Belgian Banking Association, the Savings Banks Group and at each public credit institution. Data relating to transactions with payment cards are obtained from a quarterly survey conducted by the central bank (since 1985) at the various companies concerned (PAYSYS). Transactions exchanged in the interbank clearing procedure also include those effected by banks for their own account.

# PAYMENT SYSTEMS IN CANADA

# Table of contents

## INTRODUCTION

As in other developed countries, the payments system in Canada has, for some time, been evolving from a system based almost exclusively upon cash and paper transactions towards an electronic system in which such transactions will eventually assume a less prominent role. While the Canadian payments system is, perhaps, at an earlier stage in that evolutionary process than the payment systems of some other countries, the volumes of various types of electronic transaction have grown at an increasingly rapid rate in recent years, and there has been mounting activity in the development, testing and implementation of new and innovative electronic payment mechanisms. Nevertheless, because the operations of paper-based payment mechanisms are highly automated, are very efficient, and minimise float, their cost disadvantages vis-à-vis various electronic payment mechanisms may not be so pronounced as in some other countries. Accordingly, the role of paper in the Canadian payments system as a whole, while gradually diminishing, is still likely to remain significant in the coming years. The displacement of cash by electronic payment mechanisms is not yet apparent, but electronic funds transfer at the point of sale (EFT/POS) is still at a relatively early stage of acceptance by individual consumers.

Several activities are currently shaping the evolution of the Canadian payments system. Those activities are:

- development of an electronic payments system for large-value transactions that has such attributes as certainty of settlement, irrevocability of settlement, and finality of payment (see Section 3.3 below);
- work leading to the implementation of a new system for the exchange and settlement of securities transactions in which securities ownership will be transferred on a transaction-by-transaction basis and payments made at the end of the day on a net basis (see Section 4.2.1 below); and
- development of a multilateral foreign exchange netting facility (see Section 4.1.3 below).

## 1. INSTITUTIONAL ASPECTS

### 1.1 General legal aspects

Except for the federal Currency Act, the federal Bills of Exchange Act - modelled on the British statute of 1882 - the federal Canadian Payments Association Act, and certain provisions of provincial legislation, the legal framework for the Canadian payments system has been established principally through contract and private agreement and the interpretation of those contracts and agreements by the courts. Moreover, the legal framework is largely concerned with procedural matters.

The legal framework for bank credit cards, for example, comprises specific provisions of provincial consumer protection legislation that pertain to such matters as the unsolicited distribution of credit cards and the liability for the unauthorised use of a card, the agreement between a cardholder and a card-issuing deposit-taking institution, the agreement between a merchant and a card-issuing institution, and the by-laws and operating rules of the two card plans. The statutory and contractual arrangements set out, for example, the rights and responsibilities of the parties and the procedures for such matters as the clearing and settlement of sales vouchers and the return or charging back of vouchers. The Bills of Exchange Act does not apply to bank credit cards because the sales vouchers are neither bills of exchange nor promissory notes. Even in the instance of cheques, the Bills of Exchange Act is but one modest part of the legal framework. The legal framework consists largely of

the rules of the common law of England, the clearing by-law and rules of the Canadian Payments Association (CPA),[1] and the agreement between a deposit-taking institution and a customer.

In May 1992, the federal Department of Consumer and Corporate Affairs issued the Canadian Code of Practice for Consumer Debit Card Services. This Code is "voluntary" in the sense that it is not legally binding, as is a statutory provision or a contract. The Code covers the issuing of debit cards and personal identification numbers, debit cardholder agreements, debit card transactions, liability for loss, and the resolution of disputes.

Apart from a provision of the Canadian Payments Association Act that requires the federal Superintendent of Financial Institutions - the supervisor of federally incorporated financial institutions - to report annually to the federal Minister of Finance whether or not the CPA is operating in conformity with its Act and by-laws, there is no statutory regulation or supervision of the Canadian payments system.

While there is no competition legislation or regulation that applies specifically to the Canadian payments system, general competition law does.

## 1.2 Financial intermediaries that provide payment services

The financial system of Canada includes a number of different types of intermediary or institution - deposit-taking institutions, insurance companies, investment dealers, sales finance companies, and so forth.[2] Non-deposit-taking financial institutions are, however, users of the payment services that are provided by deposit-taking institutions rather than providers of payment services themselves. Accordingly, it is deposit-taking institutions - i.e. those financial institutions that typically accept deposits transferable by order to a third party - that are the most important financial institutions in the context of the Canadian payments system.

Canadian deposit-taking institutions comprise chartered banks, cooperative credit institutions, trust and loan companies, and governmental savings institutions. Each type of deposit-taking institution is described separately below, and the institutional information presented in this sub-section is supplemented by data on transferable deposit liabilities and on domestic branches that appear in Table 2 and Table 5.

### *1.2.1 Chartered banks*

Chartered banks are analogous to commercial banks in the United States and other countries. Although chartered banks were originally established early in the nineteenth century primarily to serve the commercial, industrial and governmental sectors of the Canadian economy, during the past thirty-five years they have also competed aggressively with other financial institutions in the market for personal financial services.

As at 31st December 1992, there were sixty-eight chartered banks. The six largest banks operate on a nationwide basis and internationally, while the remaining banks concentrate on serving the financial needs either of a particular region of the country or of a particular sector of the economy. Most of the latter banks are the wholly-owned subsidiaries of foreign banks.

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1 For more on the Canadian Payments Association, see Section 1.4.1 below.

2 On 1st June 1992, a new legislative framework for federal financial institutions came into force with the proclamation of the Bank Act, the Cooperative Credit Associations Act, the Trust and Loan Companies Act, and the Insurance Companies Act. Under the new legislation, federal financial institutions are now able to offer most kinds of financial services either directly, through subsidiaries, or as an agent, through a networking relationship.
For an overview of the new legislative framework, see Fred Daniel, Charles Freedman and Clyde Goodlet, "Restructuring the Canadian Financial Industry", *Bank of Canada Review*, winter 1992-93.

All chartered banks are incorporated and operate under the provisions of the Bank Act. This federal Act regulates certain aspects of the banks' operations, such as the auditing of accounts, corporate powers and the issuing of stock, and the banks' relationships with the public, the federal government and the Bank of Canada. The Bank Act has been revised at approximately ten-year intervals since 1871; the most recent revision came into force on 1st June 1992.

Chartered banks accept various types of deposit from the public, including accounts payable on demand, personal savings deposits - both chequable and non-chequable - non-personal notice deposits, and fixed-term deposits. In addition to holding a portfolio of securities, banks make loans under a variety of conditions for agricultural, commercial, consumer, and industrial purposes. Banks also deal in foreign exchange, provide safekeeping facilities, and perform various other services. In the instance of the largest banks, these operations are, for the most part, carried out through their extensive networks of branches. The head offices of the banks typically confine their activities to general administration, policy functions, the management of investment portfolios, and similar matters. As at 31 December 1992, there were 7,764 chartered bank branches in Canada and nearly 300 branches in some sixty foreign countries.

### *1.2.2 Cooperative credit institutions*

Cooperative credit institutions - i.e. local credit unions and caisses populaires, centrals, and federations of centrals - play a significant role in the Canadian economy.

#### *(a) Local credit unions and caisses populaires*

Local credit unions and caisses populaires, which are located primarily in the province of Québec, are deposit-taking institutions that provide savings, loan and other financial services to their owner-members. These institutions are based upon the principles established by the original Rochdale cooperative pioneers and operate in response to their members' needs. They range in size from small, community-based institutions to large, multi-branch operations.

As at 31st December 1992 there were 2,615 local credit unions and caisses populaires, with some 9.5 million members.

Membership in a local credit union or caisse populaire is based upon a common bond of association, such as residence in a community or parish, employment in an industry or profession, or affiliation with an ethnic group. Membership is available through the purchase of a share - usually a Can.$ 5 savings share - with democratic control being retained by allocating only one vote to each member, regardless of the number of shares held.

Local credit unions and caisses populaires are incorporated and operate under provincial legislation as autonomous organisations. The legislation typically prescribes the types of investment permitted, required liquidity reserves, and so forth. In some provinces, an annual audit of the operations of a local credit union or caisse populaire must be performed by outside auditors. Moreover, regular inspections are carried out by provincial government departments or their agents to ensure that locals credit unions and caisses populaires are complying with the provisions of the applicable legislation.

Local credit unions and caisses populaires were originally established to encourage saving and to provide loans to members who could not obtain credit elsewhere or who could obtain it only at prohibitive interest rates. Today, however, most have adopted a full-service approach and offer a variety of savings vehicles, chequing privileges, personal and mortgage loans, small business loans, commercial credit, travellers' cheques, safekeeping facilities, and automated banking machines.

### *(b) Centrals*

Centrals have been established by local credit unions and caisses populaires as second-tier organisations of the credit union movement to increase the stability of local credit unions and caisses populaires and to enhance each region's ability to deal with economic fluctuations.

Centrals are incorporated or registered under provincial legislation - typically a credit union Act - and are owned primarily by their member local credit unions or caisses populaires. (A small number of local credit unions and caisses populaires are not, however, members of a central.) Each central is also an entity independent of other centrals, whether located in the same or another province, though it might have operational links with them. The primary functions of centrals are: to provide member local credit unions and caisses populaires with services they could not otherwise provide for themselves; to assist member local credit unions and caisses populaires in increasing the efficiency of their operations; and to enhance the effectiveness and usefulness of local credit unions and caisses populaires to their own members. These functions involve, among other things, the investment of surplus funds of local credit unions and caisses populaires and the lending of funds to those institutions when they cannot meet the local demand for loans, the administration of on-line computer systems, and the provision of clearing services. Local credit unions and caisses populaires are permitted to invest and deposit their statutory liquidity reserves and other surplus funds with their central, and many do so. To accommodate these funds, centrals offer a wide range of demand and fixed-term deposit accounts. Funds that are required by a central beyond those provided by its member local credit unions or caisses populaires are obtained through borrowings either from chartered banks or, more recently, from the national central.

As at 31st December 1992 there were twenty-four centrals in Canada.

### *(c) Federations of centrals*

With the establishment of centrals, a need arose for third-tier organisations that could provide centrals and other cooperative organisations with coordinated financial and support services similar to those offered by centrals themselves to their member local credit unions and caisses populaires.

Credit Union Central of Canada (CUCC) was incorporated in 1953 as The Canadian Cooperative Credit Society Limited under the federal Cooperative Credit Associations Act, which is now administered by the Office of the Superintendent of Financial Institutions. The primary objectives of the CUCC are to provide loans and capital for the credit union movement and for its member-shareholders and to offer other financial and support services that have been identified by its member-shareholders. The activities of the CUCC in promoting the development of the credit union movement include: coordination of new products and services at the national level; liaison with and representations to the federal government and its agencies concerning matters that affect centrals and other cooperative organisations; provision of coordinated support services in the areas of public relations, marketing, education, and research; participation in the Canadian Payments Association; and participation in international cooperative organisations.

Membership in the CUCC is open to centrals and to other cooperative organisations that can meet the criteria established by the Office of the Superintendent of Financial Institutions. At the present time, the CUCC has forty-seven member-shareholders, of which eight are centrals representing local credit unions and caisses populaires in as many provinces and the remainder are other types of cooperative organisation.

La Confédération des caisses populaires et d'économie Desjardins du Québec is incorporated under a law of that province. It provides financial and support services, similar to those provided by the CUCC, to its eleven member federations and to a number of other member cooperative organisations and support services to three affiliated federations outside the province of Québec.

### *1.2.3 Trust and loan companies*

Trust companies perform both financial intermediary and fiduciary functions. Under the financial intermediary function, trust companies can accept funds from the public in exchange for their own instruments, such as trust deposits and guaranteed investment certificates. This aspect of their business is often referred to as the "guaranteed funds portion" and differs little from the savings business of other deposit-taking institutions. Many trust companies also accept deposits transferable by order to a third party. Trust companies are the only corporations in Canada with the power to conduct fiduciary business. Under this function, they act as executors, as trustees and administrators under wills or by appointment, as transfer agents for stock and bond issues, as trustees for bond issues, and in a variety of other agency and trustee capacities.

Loan companies may also accept deposits from the public and may issue both short and long-term debentures. Many loan companies are subsidiaries of chartered banks.

Trust and loan companies were established and grew rapidly under provincial legislation in the late nineteenth and early twentieth centuries. Some companies were incorporated by special Acts of Parliament, but it was not until 1914 that the federal government began to regulate trust and loan companies registered under its Acts. The Superintendent of Financial Institutions supervises federally incorporated trust and loan companies and also, by arrangement with the provinces concerned, trust and loan companies incorporated in a number of provinces. Trust and loan companies, whether federally or provincially incorporated, must be licensed in each province in which they operate.

As at 31st December 1992 there were eighty-two trust companies and sixteen loan companies in Canada.

### *1.2.4 Governmental savings institutions*

There are two governmental savings institutions in Canada - the Province of Alberta Treasury Branches and the Province of Ontario Savings Office.

#### *(a) Province of Alberta Treasury Branches*

The Alberta Treasury Branches were established in 1938 under the provincial Treasury Branches Act to provide savings and loan services. The Act establishes the "Province of Alberta Treasury Branches" as a division of the provincial Treasury Department. However, the Treasury Branches are kept separate from the other operations of this Department. For example, the Treasury Branches Deposit Fund, which is defined in the Act to encompass all the assets and liabilities of the Treasury Branches, is maintained separately from the provincial General Revenue Fund. The provincial government can establish and operate Treasury Branches anywhere in Alberta.

The Alberta Treasury Branches now provide a wide range of financial services to their customers. These services include: current and savings accounts; loans; safekeeping facilities; travellers' cheques; money orders and drafts; foreign remittances and money transfers; and the sale and purchase of securities.

#### *(b) Province of Ontario Savings Office*

The Province of Ontario Savings Office was established under the provincial Agricultural Development Finance Act of 1921. The legislation empowers the Treasurer of Ontario to borrow money by means of deposits in any amounts and from any persons. The Treasurer may open offices for this purpose anywhere in Ontario. The provincial Cabinet may fix the conditions as to interest and repayments that will govern deposits.

The Province of Ontario Savings Office does not lend money to the public. All funds in excess of day-to-day requirements are deposited in the provincial Consolidated Revenue Fund. For bookkeeping purposes, the Treasurer of Ontario pays interest on these funds to the Savings Office. The interest paid by the Treasurer is sufficient to meet the interest to be paid on public deposits and all other expenses, including premises and salaries. Any "net profit" on operations is credited to the Treasurer at the end of the year.

The principal service offered to the public by the Province of Ontario Savings Office is a savings account - in effect, an interest-bearing demand deposit with free chequing privileges. The Savings Office does, however, offer other services, including guaranteed investment certificates, safekeeping facilities, travellers' cheques and money orders.

### 1.3 The role of the central bank

The Bank of Canada, Canada's central bank, began operations on 11th March 1935 under the provisions of the federal Bank of Canada Act of 1934, which charged the Bank with responsibility for regulating "credit and currency in the best interests of the economic life of the nation" and which conferred upon it specific powers for discharging that responsibility. The Act also vested in the Bank the sole right to issue paper money for circulation.

The role played by the Bank of Canada in the payments system is central but operationally relatively limited. The Bank does not accept deposits from individuals or non-financial business corporations or compete with deposit-taking institutions in the lending field. The Bank does, however, interact with the payments system in two different ways: first, it facilitates and effects the final settlement of balances for the national clearing and settlement system and, second, it acts as the agent of the federal government by clearing government receipts and disbursements.

The operational role of the Bank of Canada has not expanded significantly as a result of the introduction of electronic payment mechanisms. Nevertheless, the Bank has an obvious interest in the efficiency and soundness of the operations of the national payments system, and it plays an important role in the Canadian Payments Association (see Section 1.4.1 below). This role has been conferred upon the Bank by the Association's Act, which requires the Bank to appoint one of its officers to be both a Director of the Association and the Chairman of the Association's Board of Directors.

The establishment of the Canadian Payments Association led to a new and direct relationship between the Bank of Canada, in its role as the provider of the final means of settlement between participants in the national clearing and settlement system, and a number of important non-bank deposit-taking institutions. Both chartered banks and non-bank deposit-taking institutions that participate directly in the clearing and settlement process - i.e. Direct Clearers - maintain settlement accounts at the Bank through which their daily clearing gains and losses vis-à-vis the other participants are settled. Each Direct Clearer has access to overdraft facilities at the Bank to meet a temporary deficiency in its settlement account.[3]

Unlike other central banks, the Bank of Canada has no statutory responsibility for the regulation or supervision of financial institutions.[4]

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3 For further background, see Donna Howard, "The Evolution of Routine Bank of Canada Advances to Direct Clearers", *Bank of Canada Review*, October 1992, and Section 5.2.5 below.

4 The Governor of the Bank of Canada is, however, a member of the Board of Directors of the Canada Deposit Insurance Corporation and of the Financial Institutions Supervisory Committee (FISC). (The other members of the FISC, which was established in 1987, are the Superintendent of Financial Institutions, who also chairs the committee, the Chairman of the Board of Directors of the Canada Deposit Insurance Corporation, and the Deputy Minister of Finance.)
The FISC is meant to ensure consultation and information exchange on supervisory matters that have implications for solvency, last-resort lending, and the risk of deposit insurance payout. These matters include issues of prudential

The head office of the Bank of Canada is in Ottawa. The Bank has agencies in nine cities across Canada.

## 1.4 The role of other private and public sector bodies

### *1.4.1 Canadian Payments Association*

#### *(a) Background*

The Canadian Payments Association Act came into force on 1st December 1980. The objectives of the Association, as set out in the Act, are "to establish and operate a national clearings and settlements system and to plan the evolution of the national payments system".

The management and operation of the CPA are the responsibility of a board of directors, the members of which are, with the exception of the Director appointed by the Bank of Canada, elected by the CPA's different classes of member institution. (The four classes of member institution are: chartered banks; credit union centrals and federations; trust and loan companies; and other deposit-taking institutions.)

As at 31st December 1992 the membership of the CPA comprised, in addition to the Bank of Canada, sixty-eight chartered banks, twenty-six credit union centrals and federations, forty-seven trust and loan companies, and twelve other deposit-taking institutions - viz. the Alberta Treasury Branches and eleven large local credit unions that are not members of a central - making a total of 154 member institutions. Taken together, the CPA's member institutions account for well over 95% of the transferable deposit liabilities of all Canadian deposit-taking institutions.

#### *(b) The CPA's first objective - to establish a national clearing and settlement system*

The first objective of the CPA was to bring non-bank deposit-taking institutions into partnership with the chartered banks in the management of the clearing and settlement system. On 1st February 1983, following approval of the CPA's clearing by-law by the federal Cabinet, the Association assumed responsibility for the operation of the system. Previously, the chartered banks had exchanged between themselves all the cheques and other payment items passing through the system and had settled the resulting balances through their reserve accounts at the Bank of Canada. Any other deposit-taking institution that accepted transferable deposits was effectively required to use the services of one of the chartered banks as its agent in clearing its customers' cheques and other payment items through the system. Those institutions also had no voice in either the management or operation of the system.

To be eligible to represent itself directly in the clearing and settlement process rather than employ an agent - i.e. to be a Direct Clearer - a CPA member institution must account for one-half of 1% of the total volume of cheques and other payment items exchanged through the clearing and settlement system. Taken together, the eligible institutions, including the Bank of Canada, account for more than 96% of this total, which, during 1992, amounted to 2.2 billion individual items.

As at 31st December 1992 there were fourteen Direct Clearers: the Bank of Canada; eight chartered banks; and five non-bank deposit-taking institutions, including two that act as Group Clearers on behalf of centrals and federations.

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regulation, the practices and condition of individual federal financial institutions, and the coordination of action when dealing with troubled institutions. Hence, the FISC is intended to give the Superintendent of Financial Institutions, who is responsible for judgements pertaining to the viability and solvency of federal financial institutions, the full benefit of views from the deposit insurer and the lender of last resort when making supervisory decisions.

As can readily be appreciated, the operations of the national clearing and settlement system are large and complex. Responsibility for the maintenance of this vital system has been entrusted by the Board of Directors of the CPA to the National Clearings Committee (NCC).

The primary role of the NCC is to maintain an ongoing review of the inter-member procedures, standards and practices for the exchange of paper-based and electronic data within the national clearings and settlement system. The Committee reviews the CPA Rules Manual, the procedures and standards in which govern the exchange, clearing and settlement of payment items, and recommends to the Board of Directors of the CPA, for its approval, necessary or desirable changes to the procedures and standards. The NCC also coordinates inter-member efforts to eliminate operational problems and to increase the efficiency of the national clearing and settlement system.

Every Direct Clearer is entitled to representation on the NCC.

### *(c) The CPA's second objective - to plan the evolution of the national payments system*

The approach to developing the payments system of the future that is embodied in the CPA was the first of its kind in the world, though comparable organisations have now been established in other developed countries. The essence of that approach is that responsibility for planning the evolution of the payments system has been entrusted, not to a central governmental organisation or to a regulated monopoly, but to a private association of interested deposit-taking institutions - some private companies, some cooperative institutions, some governmental entities.

The short to medium-term goals of the CPA are quite evident from the work that the Association has undertaken in recent years to develop the Canadian payments system:

- promoting and extending the use of direct funds transfer for recurring credit payments and electronic pre-authorised credits in general;
- developing a secure, timely and cost-effective funds transfer facility for the making of consumer bill payments;
- developing rules for commercial cash management payments that are effected by means of debit transfers on magnetic tape;
- developing an electronic large-value transfer system (LVTS);
- developing standards and guidelines that specify the basic message formats and that address the security and audit requirements for payments that are effected by means of Electronic Data Interchange (EDI); and
- developing standards and guidelines for integrated circuit or "smart" cards.

None of these initiatives concerns the Direct Clearers alone or, indeed, the members of the CPA alone. The needs and preferences of a wide variety of other financial institutions and non-financial corporations are involved, as are those of consumers. The necessary process of consultation, reconciliation and allocation of responsibility are in progress under the auspices of the CPA.

The Senior Planning Committee (SPC), a standing committee of the Board of Directors of the CPA, has the general responsibility for advising the Board on all matters that relate to planning the evolution of the national payments system.

The terms of reference of the SPC give the Committee four specific responsibilities:

- to identify specific systems development projects;
- to be the principal channel through which the various sectors of the Canadian economy not represented within the CPA - e.g. consumers, retailers, communications common carriers and equipment manufacturers - may express their views in the planning process;

- to identify subjects requiring research by the CPA; and
- to develop policy statements concerning the national payments system for approval by the Board.

The work of the SPC is complemented by that of such ad hoc committees as the Bill Payment Task Force, the EDI Support Group, and the Canadian Smart Card Standard Committee for Financial Institutions Steering Committee.

In addition to regular liaison with a wide variety of individual non-member institutions and organisations, the SPC has, since 1988, held two plenary meetings every year. The plenary meetings serve two purposes: first, to provide representatives of non-member institutions and organisations with an opportunity to express the views of their group in the planning process and, second, to provide the SPC with an opportunity to discuss with the representatives the issues that are currently before the Committee.

A new and important element has recently been added to the consultative process of the CPA by the establishment of a committee in which members of the Board of Directors meet with representatives of the federal Department of Finance to discuss current and prospective developments within the national payments system - e.g. the establishment of an LVTS for Canada - and the possible implications of those developments for public policy.

### *1.4.2 Interac Association*

#### *(a) Background*

The Interac Association was formed in the spring of 1985 to facilitate the exchange of electronic transactions that arise from the use of shared networks. More specifically, the role of Interac is to facilitate the development of shared services that, in turn, support electronic banking and payment services that are offered by its member institutions.

Deposit-taking institutions that are members of the Canadian Payments Association are eligible to be members of Interac. Interac has two types of member: charter members, of which there were nine at the end of 1992, and sponsored members, of which there were nineteen at the end of 1992. Interac counts among its members the leading Canadian chartered banks, cooperative credit institutions, and trust companies. It has been estimated that Interac's member institutions account for over 97% of the debit cards issued in Canada and contribute over 97% of the automated banking machines (ABMs)[5] deployed in Canada to Interac's shared cash dispensing service. It should be noted, however, that there has recently been some public debate about the terms and conditions of access to Interac's shared networks.

Interac is governed by a board of directors that consists of a representative of each charter member and two representatives of the sponsored members. A number of committees report to the Board of Directors, the foremost of which are the Operations, Marketing and Security Committees. The composition of those three committees mirrors that of the Board.

#### *(b) The shared cash dispensing service*

In June 1986, Interac commissioned a national service to exchange transactions originating from shared ABMs. The service permits eligible cardholders of participating Interac member institutions to use their cards and their confidential personal identification numbers (PINs) at

5 In Canada, automated teller machines (ATMs) and cash dispensers are referred to collectively as "automated banking machines".

any participating member's ABM in Canada to obtain cash from either their deposit or credit card accounts.

During the first month of operation, the shared cash dispensing service was used more than 170,000 times. One year later, monthly usage had risen to over 2.7 million withdrawals. During October 1992, over 17.9 million withdrawals were made at shared ABMs by cardholders. The number of ABMs contributed to the shared service has also risen steadily. Just over 2,500 machines were available in June 1986; in October 1992, more than 14,260 were available within the network across Canada. It has been estimated that over 30 million debit and credit cards issued by Interac member institutions are eligible to access the services of the shared ABM network.

### *(c) Interac direct payment service*

Shortly after implementation of the shared cash dispensing service, Interac embarked on a number of studies of electronic funds transfer at the point of sale (EFT/POS). By June 1988, the major business and technical issues had been addressed, and Interac decided to proceed with the development of a new shared service to interface with the networks of member institutions that deliver EFT/POS services to members' debit cardholders and retailer customers.

The new service, known as Interac Direct Payment, enables consumers to use a debit card and PIN issued by an Interac member institution to pay for purchases made at a participating retailer directly from their chequing or savings accounts.

Following a period of development and testing, Interac Direct Payment was implemented as a pilot on 10th October 1990. At the end of 1992, the service was available at more than 2,600 retail locations in the Ottawa-Hull-Gatineau area. Although any eligible debit cardholder may use the service at those locations, the major users have been the more than 450,800 active cardholders within the Ottawa-Hull-Gatineau area. After some twenty-five months of operation, over 6.1 million transactions had been processed on the Interac Direct Payment service in the test area.

Since 1985, a number of Interac member institutions have implemented their own proprietary EFT/POS systems, and most of those have now progressed beyond the pilot stages. It is anticipated that those proprietary networks will be linked to Interac Direct Payment as that service is expanded across the country. On 16th September 1992 the service was expanded into the provinces of British Columbia and Québec. With that expansion, there were over 3.6 million active cardholders in the two provinces who were able to access over 21,900 terminals at over 16,850 retail locations. During the two months following expansion of the service, some 6.4 million transactions were processed in Québec and over 150,000 in British Columbia. Interac's current plans contemplate the inauguration of the service in Alberta during the spring of 1993 and in the two remaining Prairie provinces - Saskatchewan and Manitoba - and northern Ontario during the autumn of 1993, with further expansion planned for 1994.

It has been estimated that more than 18 million debit cards issued by Interac member institutions will be able to participate in the national Interac Direct Payment service.

### *(d) The technical environment*

The shared services and networks of Interac are based on a distributed architecture. Minimum standards for the functionality, operability and security of the shared networks are specified by Interac itself.[6] Some additional standards that pertain to member portions of the overall shared

6 The detailed technical standards that are specified by Interac complement the high-level business standards for networks of shared ABMs and for EFT/POS that have been promulgated by the Canadian Payments Association. The latter standards address, among other things, the issues of privacy, confidentiality and security.

networks are also set by Interac in the interests of ensuring that a consistent interface is presented to cardholders.

The member institutions of Interac are responsible for acquiring or developing interface software and equipment that meets the functionality and security standards that have been established by Interac. Groups of member institutions commonly join together to form consortia to develop appropriate software and hardware for the interface to the shared networks. The services that are offered by a member institution to its customers are always considered to be the proprietary responsibility of the member. In this way, minimum standards for the basic service are implemented in a uniform manner and competitive forces in the marketplace maintained.

Interac contracts, as required, with service suppliers to operate common portions of the shared inter-member networks. However, Interac does not certify or recommend any type or manufacturer of software, equipment or other facility used by its member institutions within their own networks. Each member institution is responsible for acquiring the type of software and equipment that best meets its own needs and that conforms to Interac's standards.

## 2. SUMMARY INFORMATION ON PAYMENT MEDIA USED BY THE PUBLIC

### 2.1 Cash payments

#### *2.1.1 Background*

##### *(a) Coinage*

The Ottawa Mint, established as a branch of the Royal Mint under the United Kingdom Coinage Act of 1870, was opened on 2nd January 1908. On 1st December 1931, by an Act of the Canadian Parliament, it became the Royal Canadian Mint and operated as a branch of the federal Department of Finance. The Mint was established as a crown corporation - i.e. a government-owned corporation - in 1969 by the federal Government Reorganization Act of that year to allow for a more industrial type of organisation and for greater flexibility in producing coin for Canada and other countries. The Mint reports to Parliament through the Minister of Supply and Services.

##### *(b) Currency*

The Bank Act of 1871 laid the foundation for the coordinated issue of currency by chartered banks, and this system continued in effect until 1934. Concurrently with the issue of currency by banks, the federal government issued 25 cent, $1 and $2 Dominion of Canada notes between 1870 and 1935. Large-denomination Dominion "Bank Legal" notes were also issued for use in the clearings between the banks.

In 1934, with the creation of the Bank of Canada, the sole responsibility for the issue of paper currency was transferred to the new institution, although the withdrawal of chartered bank currency was spread over a fifteen-year period. Chartered banks paid over to the Bank of Canada the final balances outstanding in their note circulation accounts as at 31st December 1949, and the Bank assumed the liability.

### *2.1.2 Distribution and handling*

#### *(a) Coin*

Direct Clearers provide the public with Canadian coin. At all their branches, the Direct Clearers always attempt to have an adequate supply of coin to meet the public's needs. However, some branches might find that they are paying out coin, either in cashing cheques or through cash withdrawals by depositors. If, in these circumstances, a Direct Clearer runs low, its central offices replenish their supplies directly from the Mint, which maintains stocks of new coin in depots in major cities across the country.

The federal government will neither buy back nor take back coin that is still fit for circulation. However, the Mint will assist in the exchange of coin between surplus and deficit Direct Clearers, since this is more efficient than having the deficit Direct Clearers order more coin. Direct Clearers ship unfit coin directly to the Mint for redemption and settlement.

#### *(b) Bank of Canada notes*

Direct Clearers are also the main distributors to the public of Bank of Canada notes. Notes that the public finds surplus to its needs will be taken in by deposit-taking institutions and redeposited with Direct Clearers. Unlike coin, surplus notes, even if fit for reissuing, may be returned by the Direct Clearers to the Bank of Canada, either in exchange for other denominations or for immediate credit to their accounts. The principal reason for this difference between notes and coin is that notes are a liability of the Bank. The Bank must, therefore, redeem its liability and take back notes that are not wanted by either the Direct Clearers or the public, even though they may be fit for reissue.

The Bank of Canada also redeems unissuable notes - i.e. notes that are too soiled or worn or otherwise unfit for further circulation. Each branch of a Direct Clearer, in handling notes, is expected to sort out the unissuable notes and parcel them up in accordance with instructions issued by the Bank. Each branch then ships its parcels of unissuable notes directly to the nearest Bank of Canada Agency, which processes the notes using high-speed equipment.

Notes still fit for circulation that are turned in to the Bank of Canada are processed, held and then reissued as the need arises. The Bank also arranges for the supply of new notes, buying them from two privately owned printing companies and issuing the notes in response to orders received from the Direct Clearers.

### *2.1.3 Usage*

Although there is a wide variety of payment media available to Canadians, it would appear that notes and coin continue to be the most common and frequently used means of effecting everyday small-value transactions. Unfortunately, there are no data or other information on either the number or the value of cash payments.

Data on the value of coin and Bank of Canada notes in circulation are presented in Table 4.

## 2.2 Non-cash payments

### *2.2.1 Transferable deposits*

Until the mid-1950s, chartered banks offered individuals only one type of deposit account, the so-called "ordinary or regular savings account", on which they reserved, but typically

waived, the right to require fifteen days' notice of withdrawal. Because a growing number of cheques were being issued on these accounts, the banks introduced personal chequing accounts. These accounts differed from the ordinary savings account in that no interest was paid on them and that encashed cheques were returned to the issuer along with a monthly or quarterly statement.

Competition among deposit-taking institutions for transferable deposits has intensified during the past twenty-five years. Deposit-taking institutions have introduced innovations such as personalised cheques, monthly statements, bank-by-mail plans, demand and chequable savings accounts featuring the daily calculation of interest, and the more widespread use of overdraft facilities. Over time, fewer and fewer deposit-taking institutions are offering free chequing.

Data on Canadian transferable deposits are presented in Table 2.

### *2.2.2 Cheques and other paper payment instruments*

#### *(a) Background*

The legal framework for cheques and other paper payment instruments consists primarily of the federal Bills of Exchange Act, the common law, the Canadian Payments Association Act, and the agreement between a deposit-taking institution and a customer.[7]

*(i) The Bills of Exchange Act*

The federal Bills of Exchange Act represents the legislative source of the legal framework that governs cheques and other bills of exchange. It was passed by Parliament in 1890 and is derived from the British Bills of Exchange Act of 1882. The Canadian version, it should be noted, has remained in substantially the same form since its last major revision in 1906.

*(ii) The common law*

The common law represents the judicially developed source of the legal framework for cheques and other paper payment instruments and, together with commercial law, is specifically incorporated into the Bills of Exchange Act by Section 10 of that Act. Some of the fundamental principles that govern the use of cheques and other bills of exchange are derived from the cases decided by the courts, including those in the United Kingdom.

*(iii) The CPA Rules Manual*

Within the broad framework provided by the Canadian Payments Association Act and the clearing by-law of the CPA (see Section 1.4.1 above and Section 3.1.1 below, respectively), the CPA Rules Manual sets out the rules - i.e. the procedures and standards - that govern the daily operations of deposit-taking institutions in the national clearing and settlement system.

The rules facilitate the exchange of cheques and other payment items between deposit-taking institutions because they establish when the participating institutions will be reimbursed and will be able to return these items to the presenting institution. These rules touch upon many aspects that affect the treatment of cheques and other payment items, including provisions that:

- determine what items may be entered into the national clearing and settlement system;
- set out which items may be returned by branches or by data centres;

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7 In the Canadian context, "other paper payment instruments" include travellers' cheques, postal money orders, claim and reimbursement drafts, and bank settlement vouchers.

- set out the time limits for the exchange or return of items through the system; and
- govern the participation of Indirect Clearers - i.e. deposit-taking institutions that do not participate directly in the clearing and settlement process.

*(iv) The agreement between a deposit-taking institution and a customer*

Most deposit-taking institutions require a customer, on opening an account, to sign some kind of standard agreement. The agreement, which is often referred to as the "operation of accounts agreement", covers a variety of subjects, including the following:

- the authority to charge accounts;
- service charges;
- lost instruments;
- agent for collection;
- the waiver of certain rights;
- cheque forms;
- the authority to return an item; and
- verification of the statement of account.

***(b) Usage***

Cheques and other paper payment instruments continue to be, in terms of value, the single most important means of payment used by Canadians to effect non-cash payments, accounting for an estimated 98.8% of the total value of all such payments during 1992. In terms of volume, however, cheques and other paper payment instruments have declined sharply in importance relative to other cashless payment instruments. The volume of paper-based transactions grew throughout the 1980s but, in contrast with card-based and electronic transactions, at a diminishing rate. Moreover, in both 1991 and 1992, the estimated number of paper-based transactions fell below that of the previous year.

### *2.2.3 Electronic instruments*

Both direct debit arrangements - typically referred to as "pre-authorised debits" - and direct credit arrangements - usually referred to as "direct deposit" or "direct funds transfer systems" - are being used increasingly in Canada. They are confined mainly to recurring, fixed-amount payments such as insurance premiums, mortgage payments, utility bills, and rent in the instance of debits and as salaries, annuities and, increasingly, governmental payments in the instance of credits.

Direct debit and credit payments can be effected by the clearing of paper vouchers or by exchanging magnetic tapes. Paper vouchers are still occasionally used for debits, while magnetic tapes are generally used for direct credit payments.

Pre-authorised debits began in Canada with the introduction of the original Pre-Authorised Payments (PAP) Plan by chartered banks during the 1950s. The Plan was designed to collect contractual and recurring payments for a company from its clients. The Plan was to be used exclusively for fixed-amount and fixed-period payments such as insurance premiums and mortgage instalments.

With the establishment of the Canadian Payments Association (CPA) in 1980, it became necessary to adapt the PAP mechanism, which was founded upon an interbank indemnity agreement, to the statute-founded environment of the CPA and, at the same time, to address certain anomalies.

The PAP mechanism was beginning to be used for the interchange of transactions that would not normally have been expected to fall under the procedures, such as the debiting to consumer accounts of transactions through automated banking machines and point-of-sale terminals and corporate cash management transactions. The CPA's Board of Directors issued a policy statement in March 1985 that clarified the scope of the PAP Plan and subsequently approved new procedures for pre-authorised debit payments. The key modifications included:

- bringing the Plan under the umbrella of the CPA, enabling all CPA member institutions to enter pre-authorised debits into the national clearing and settlement system;
- limiting the amount of consumer debits, with a separate facility for higher-value payments;
- requiring authorisation from the customer to cover periodic debits for a specified amount, with reasonable latitude for normal adjustments; and
- protecting the customer and the system as a whole through standardised documentation and conditions governing the dispute of an item by a payer.

The direct funds transfer system (DFTS) is the computerised pre-authorised credit transfer system. Until 1983, the system was operated in accordance with operating rules that had been agreed upon between the chartered banks and the federal government on the basis of more general procedures and standards for the exchange of financial data on magnetic tape. Since 1983, however, the system has continued to operate using the equivalent rules of the CPA and had been open to participation by all Direct Clearers.

Each Direct Clearer that participates in the pre-authorised debit and direct deposit systems registers with the CPA those of its data centres at which it is prepared to receive computer-readable files. There are six tape exchange points in Canada, each located in a major centre and serving the surrounding area. Virtually every branch of every deposit-taking institution in Canada can receive files addressed to it through one of the tape exchange points. Each such branch has been allocated a distinguishing number on the CPA's Financial Institutions File, the computer data base of all branches and offices of deposit-taking institutions in Canada. The value transferred by the direct deposit system is collected through an offsetting debit entry in the CPA's Automated Clearing Settlement System (ACSS) (see Section 3.1.2 below).

It should be noted that, in Canada, the development of the pre-authorised debit and direct deposit systems eliminated the need for the establishment of automated clearing houses of the type found in many other developed countries.

### *2.2.4 Cards*

#### *(a) Bank credit cards*

The two bank credit card plans[8] permit cardholders to obtain cash advances at the branches of all the member deposit-taking institutions of each plan and to charge purchases at the outlets of all participating merchants. Cardholders are billed once a month and have the option of paying the whole amount or an instalment. It has been estimated that over half of Canadian cardholders pay their bills in full each month, while the remainder make monthly payments. The plans that are offered by individual card-issuing deposit-taking institutions do differ; however, in most cases, if the entire amount outstanding is paid within the grace period, the length of which varies, no interest charge is made, except for cash advances. Interest on cash advances is charged from the

8 Although VISA and MasterCard have, for some time, been issued in Canada by non-bank deposit-taking institutions as well as by chartered banks, they are customarily referred to as "bank credit cards" in Canada and other countries and, accordingly, are so referred to in the present chapter. The two bank credit card plans are administered by private contract, not under procedures and standards of the Canadian Payments Association.

moment the amount is posted to the cardholder's credit card account. User fees are charged by most card-issuing institutions.

Bank credit cards are used extensively by consumers both as a means of payment and as a form of credit. The most recent data indicate that at 31st October 1992 there were 24.4 million VISA and MasterCard cards in circulation in Canada, compared with 11.6 million cards at the end of October 1982. The growth in the amounts charged on bank credit cards has also been substantial. The gross dollar volume of transactions and advances increased from Can.$ 13.4 billion during the twelve-month period ended 31st October 1982 to Can.$ 48.1 billion during the twelve-month period ended 31st October 1992. Given that approximately 639.9 million sales vouchers were processed during the latter period, the average dollar value of each transaction was about Can.$ 69.30. These trends attest to the considerable importance of bank credit cards in personal finance.

In Canada, bank credit cards, and credit cards generally, can be considered to be a "mature" product. Accordingly, the main thrust of the marketing efforts of deposit-taking institutions has been to gain market share. This intensely competitive environment helps to explain the following six important recent developments:

- the installation of terminals at an increasing number of merchant outlets to speed up the authorisation process and to reduce credit card fraud by eliminating merchant floor limits[9] and providing more timely information on lost or stolen cards;
- the move to electronic draft capture to contain the direct operating costs of card-issuing deposit-taking institutions by increasing processing efficiency;
- the introduction of premium cards to meet the needs of the "up-scale" and business markets;
- affinity group marketing;
- the introduction of such product enhancements as frequent flyer points and cash rebates; and
- the establishment of alliances between large, non-financial corporations and card-issuing deposit-taking institutions to offer discounts to the cardholders of special bank credit cards that bear the corporations' names.

### *(b) Debit cards*

In Canada, as in other developed countries, the principal function of the debit card is to provide the customer of a deposit-taking institution with access to banking and payment services through such devices as automated banking machines and point-of-sale terminals.[10] The debit card also serves, typically in conjunction with a personal identification number (PIN), to identify the cardholder and the cardholder's entitlement to services.

Proprietary debit cards have been issued to eligible customers by all the large deposit-taking institutions and by many smaller ones as well. It has been estimated that there were some 18.5 million debit cards in circulation at the end of 1992.

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9 Each merchant is given a so-called "floor limit", typically Can.$ 75, on individual credit card purchases. If a purchase exceeds the specified floor limit, the merchant is required to obtain credit authorisation.

10 For more on automated banking machines in Canada, see Section 2.2.5 below. Recent Canadian developments with respect to electronic funds transfer at the point of sale are presented in Section 1.4.2 above.

### *(c) Retailer cards*

A number of large Canadian retailers issue their own proprietary or "in-store" credit cards to their customers and are finding that their credit card operations are a powerful merchandising tool to build customer loyalty. For example, in the face of strong competition from discount chains, traditional large retailers are seeking new incentives to keep customers returning to their stores. Many now offer discounts or rebate programmes based on credit card purchases. Moreover, traditional retailers are now paying closer attention to cardholder demographics as well and are ensuring that store promotions are included in the monthly statements that are sent to their "average" cardholders. They have also been particularly aggressive in signing up new cardholders.

## *2.2.5 Automated banking machines*

### *(a) Background*

The first cash dispenser was installed in Canada by a large chartered bank in 1969, followed somewhat later, in 1972, by the first automated teller machine (ATM), again installed by a large chartered bank. The introduction of cash dispensers and ATMs, which, in Canada, are referred to collectively as "automated banking machines" or ABMs, by deposit-taking institutions during the late 1960s and the early 1970s was probably premature in terms of public demand for such machines and also with respect to both the cost and availability of on-line technology and facilities at that time. However, with the increasing exploitation by deposit-taking institutions during the late 1970s and early 1980s of the possibilities inherent in computerised systems for offering new services to customers at times and locations convenient for them, the number of ATMs installed by deposit-taking institutions began to grow rapidly. This was followed somewhat later, from 1986, by a second wave of installations of cash dispensers.

As at 31st January 1993 there were 14,576 ABMs installed by deposit-taking institutions in Canada, compared with 5,269 at the end of January 1988.

All large and several medium-sized deposit-taking institutions have proprietary ABM networks. As at the end of 1992 there were, in addition to the shared ABM networks operated by credit union centrals and federations of caisses populaires, also ten other such shared networks operating in Canada.

### *(b) Operations*

The ATMs in current use are conceptually simple devices that permit the customer of a deposit-taking institution who has an access card - either a bank credit card or debit card issued by the deposit-taking institution concerned - and a personal identification number (PIN) to withdraw notes either from an account or as a cash advance against a credit card line of credit. The customer can also make deposits, verify the status of an account, effect a number of types of transfer between accounts, and pay bills.

Cash dispensers are even simpler devices and, accordingly, a customer can use them only to withdraw notes and, in some instances, to make balance inquiries and inter-account transfers.

Although most ATMs have been installed either in the banking halls or lobbies or on the outside walls at branches of deposit-taking institutions, the installation of ATMs at remote locations - e.g. at airports and shopping malls - has become increasingly common. On the other hand, cash dispensers have, since their resurgence in popularity, been installed almost exclusively at remote locations. However, these remote locations are usually different from those where ATMs have been installed - e.g. gasoline stations and grocery stores.

### *(c) Usage*

Customer acceptance of both cash dispensers and ATMs has developed quite rapidly in Canada since the early 1980s. Not only are more customers of deposit-taking institutions using the machines, but customers are also using them more frequently and for a wider range of transactions.

It has been estimated that some one billion transactions were effected at ABMs during 1992, compared with 656.6 million during 1988. Moreover, between 50 and 60% of the customers of deposit-taking institutions are believed to use the machines currently and, of those customers, fully a third use the machines "regularly" - i.e. at least four times a week.

That ABMs are also being used to effect a wider range of transactions is shown by changes in the so-called "transactions mix". For example, it has been estimated that, during the early 1980s, cash withdrawals accounted for between 80 and 85% of all ABM transactions; that percentage was approximately 74% during 1992.

### *(d) Recent developments*

Although the emphasis of the ABM programmes of deposit-taking institutions will remain on providing customers with convenient access to cash and other commonly used services, more sophisticated services are being implemented. These new services include: passbook updating; statement printing; the dispensing of traveller's cheques; the purchase of securities; and the making of loan applications.

## 2.3 Recent developments

There have been noteworthy developments with respect to payment media used by the public in three areas - telephone banking; electronic data interchange (EDI); and smart cards.

In recent years, a number of large Canadian deposit-taking institutions have introduced services that permit their customers to make balance inquiries, to effect inter-account transfers, to pay bills, and to obtain information about current interest rates by means of touch-tone telephones.

As a result of several successful pilot projects involving Canadian deposit-taking institutions and their corporate clients and of developmental work carried out within the Canadian Payments Association (CPA), on 18th November 1992 the Board of Directors of the CPA approved Draft Standard 023 - Standards and Guidelines Applicable to Electronic Data Interchange (EDI) Transactions. The Standard sets out the minimum standards and guidelines for the movement of credit-driven electronic funds transfers and the accompanying payments-related information between participating Canadian deposit-taking institutions using EDI. Also, late in 1992, the Board of Directors approved EDI payments as items acceptable for clearing and operational procedures for the clearing and settlement of EDI payment items by participating deposit-taking institutions. At the present time, six large Canadian deposit-taking instituting are participating in the exchange of EDI payment items.

Several smart-card applications have been tested by Canadian deposit-taking institutions on a limited scale.

In early 1991, a smart-card steering committee was established by the CPA. The steering committee reports to the Senior Planning Committee of the CPA's Board of Directors and has the following responsibilities:

- to develop smart-card standards for payment applications and to adapt, wherever practical, existing international smart-card standards;

- to develop standards that will facilitate the interoperability of payment applications; and

- to promote the acceptance of the proposed smart-card standards by the Canadian Standards Organization and the International Organization for Standardization.

The membership of the smart-card steering committee consists not only of the representatives of the member institutions of the CPA but also of representatives of the federal government and of the Advanced Card Technology Association of Canada, who serve in an advisory capacity. There are two task forces under the steering committee - one to specify smart-card payment applications and another to address security requirements.

The smart-card steering committee and its task forces are mainly concerned with the operational implications of the potential payment applications of smart cards. However, smart cards have the capacity to serve a number of other applications. From the perspective of the CPA, therefore, the principal issue is to determine precisely what matters fall under the jurisdiction of the CPA in order to address such issues as the authentication of users, audit trails, settlement, and the responsibilities and liabilities of CPA member institutions in the context of the payments system.

## 3. INTERBANK EXCHANGE AND SETTLEMENT CIRCUITS

### 3. 1 The national clearing and settlement system

Canada's national clearing and settlement system is, in the opinion of many observers, one of the most effective and efficient paper-based systems in the world. One indicator of the system's effectiveness and efficiency is the universal practice among Canadian deposit-taking institutions of giving most customers immediate credit for cheques and other payment items deposited with them.

#### *3.1.1 Background*

The national clearing and settlement system is operated by the Canadian Payments Association (CPA). The Canadian Payments Association Act provides that the CPA may "... arrange the exchange of payment items at such places in Canada as the Association considers appropriate..." The Act also provides that the CPA's Board of Directors may "... make by-laws respecting clearing arrangements and related matters... (by-laws) respecting settlements and related matters... (and) subject to the by-laws... such rules respecting clearing arrangements and the settlement of payment items as it considers necessary". By-laws, but not rules, become effective only when approved by the federal Cabinet.

The national clearing and settlement system has two objectives: first, to transmit negotiable instruments from the place and institution at which they are deposited to the place and institution on which they are drawn and, second, to facilitate the settlement of the clearing balances generated by the movement of the funds represented by these instruments. The clearing by-law (By-law No. 3 of the Association), which received Cabinet approval on 16th December 1982, and the rules that have been approved by the CPA's Board of Directors govern how the various deposit-taking institutions that offer deposits transferable by order to a third party cooperate to achieve these objectives.

The contents of the clearing by-law can be divided into three types of subject matter:

- the organisational structure at Regional Settlement Points (RSPs) - e.g. the formation and management of Regional Clearing Associations;

- the general procedures for exchanging payment items and settling the claims thereby created - e.g. the classes of payment items acceptable for clearing, the different ways in which member institutions can participate in the clearings, and the procedures necessary

to effect final settlement daily at the Bank of Canada. These general procedures are complemented by the specific ones contained in the CPA Rules Manual;

- the definition of the rights and obligations of member institutions - e.g. the criteria for direct participation in the clearings, the conditional nature of the exchange of certain payment items, and the provisions for default, either on the part of a Direct Clearer or on the part of a deposit-taking institution for which it is acting as clearing agent.

As important as the clearing by-law and rules are, mutual confidence among the Direct Clearers as well as among CPA member institutions generally is important to the smooth functioning of the national clearing and settlement system. It is useful, therefore, to outline the different ways in which mutual confidence has been established and will be maintained in the future.

First and foremost is the section of the Canadian Payments Association Act respecting financial stability, which stipulates that every member institution either be a member of the Canada Deposit Insurance Corporation or the Credit Union Central of Canada or have deposits made with it insured or guaranteed under a provincial enactment that ensures inspection of its affairs.

Second, certain amendments were made to the Bank of Canada Act in conjunction with the 1980 revision of the Bank Act that authorise the Bank of Canada to accept deposits from non-bank members of the CPA and provide the Bank with the same broad powers to make advances to these deposit-taking institutions as to bank members of the Association. Accordingly, all Direct Clearers have operational relationships with the Bank of Canada and direct access to central-bank credit.

Third, Direct Clearers are required by the clearing by-law to report to the relevant regulatory authority all instances in which an Indirect Clearer needs to make sizable and repeated borrowings for the purposes of settlement. (This particular provision was adopted after consultation with the federal and provincial regulatory authorities.)

It is important to note, however, that the CPA is not a guarantor of its member institutions and that the Association does not have a mandate concerning the liquidity of its members or other prudential matters.

In summary, the clearing by-law and rules have been drafted with a view both to ensuring efficiency and equity within the national clearing and settlement system and to providing a sufficient degree of flexibility to allow for the system's future development.

### *3.1.2 The clearing and settlement processes*

The clearing process begins when a payments item acceptable for clearing is deposited at a branch of a deposit-taking institution. The items are bundled and totalled, collected by courier, and delivered to the institution's nearest data centre if the institution is itself a Direct Clearer or to its agent's if it is not. (The highly automated data centres that Direct Clearers maintain across the country and the Automated Clearing Settlement System (ACSS) that is operated by the CPA are the backbone of the national clearing and settlement system.[11]) This work starts at midday on the day of deposit. The items are then checked, amount encoded using magnetic ink, and sorted into "on-us" items and those items drawn on other Direct Clearers. At this stage, as many items as possible are microfilmed for tracing and security purposes. Items drawn on other Direct Clearers are bundled together with control listings, picked up by courier, and delivered to the data centres of those other Direct Clearers.

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11 The ACSS performs the tasks of logging each Direct Clearer's deliveries of payment items to and receipts from other Direct Clearers, of determining the "due-to" and "due-from" balances, as well as of confirming these balances with the Bank of Canada by means of an on-line, interactive computer/communications network. Each Direct Clearer has access to the network via microcomputers located in its data centres, which are used to prepare and to transmit messages to other Direct Clearers describing its outgoing shipments of items to them. Other microcomputers located in the cash-management areas of each Direct Clearer display the institution's net clearing gains or losses resulting from the exchange of items.

This exchange of items begins around 6 p.m. each day, rises to a peak late in the evening, and slows down again around midnight. The ACSS records the net clearing gains and losses resulting from the exchange of items after each delivery of items is logged on the ACSS terminal of the delivering Direct Clearer. Direct Clearers that are receiving items verify the contents of the deliveries and may contest them.

A cut-off time for the exchange of payment items is established for each RSP by the Regional Clearing Association. That time may vary from RSP to RSP and by type of item, but it is typically around midnight, local time. After the cut-off time, items exchanged between Direct Clearers are not, with certain limited exceptions, included in the figures for settlement at the Bank of Canada until the following clearing cycle.

Payment items received by a data centre drawn on branches of the same Direct Clearer in areas served by other centres are, wherever possible, also being moved by air courier that evening. However, most Direct Clearers have implemented automated systems whereby information on "on-us" items deposited in one region can be stripped from the items and transmitted, via high-speed communications lines, to data centres in other regions serving the branches on which the items are drawn, thus allowing the physical items to follow later without affecting the float time. After midnight, the data centre will fine-sort "on-us" items drawn on branches within its own region, post these items to the customers' accounts, and produce updated branch reports.

The settlement process begins at approximately 8.30 a.m. (Ottawa time) on the following day, when several regular and mutually-agreed-upon inter-Direct-Clearer transactions are effected via the ACSS - e.g. the drawdown and redeposit of balances of the federal government by the Bank of Canada, in its role as the government's fiscal agent, at each Direct Clearer.[12] At 9.30 a.m. the "preliminary" net clearing gain or loss of each Direct Clearer is available to the institution from the ACSS. Between 9.30 a.m. and 11 a.m. bilateral reopenings of the clearings may take place, via the ACSS, to handle corrections, provided that both Direct Clearers concerned agree. Shortly after 11 a.m. the "final" net gains and losses are available from the ACSS. At 1.30 p.m. (Ottawa time) the Bank of Canada obtains each Direct Clearer's "national standing" - i.e. net gain or loss - from the ACSS in the form of a specialised statement and adjusts the balances of the Direct Clearers on its own books, under the previous day's date, thus effecting the ultimate transfer of funds between Direct Clearers. At approximately 4 p.m. (Ottawa time), following any final adjustments, the Bank establishes the closing balances of each Direct Clearer as at the end of the previous day. Final settlement, therefore, takes place retroactively.[13]

### *3.1.3 Usage*

During a typical weekday evening some 10.6 million payment items are processed by the data centres of Direct Clearers. During 1992 approximately 2.4 billion items were posted to over 50 million demand and chequable savings accounts at deposit-taking institutions across the country. Of these items, about 2 billion had been exchanged and settled for between Direct Clearers, the remainder being "on-us" items.

The national clearing and settlement system also handles a wide range of payment items that are not drawn on accounts maintained at deposit-taking institutions. These items include: federal government payments, which are cleared and settled for through the Bank of Canada and which account for about 10%, by volume, of all the items handled by the system; postal and other money orders; grain payment tickets; and travellers' cheques. Finally, about 20% of the items deposited at the

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12 The drawdown and redeposit of the balances of the federal government are also a key element in the day-to-day implementation of monetary policy. For more on the implementation of monetary policy, see Section 5.3.1 below.

13 Largely in anticipation of the implementation of an electronic large-value transfer system (see Section 3.3 below), the time at which the clearings are settled will be advanced to noon (Ottawa time) beginning on 20th January 1994.

branches of deposit-taking institutions are drawn on their own customers' accounts and can, therefore, be processed internally without being entered into the national clearing and settlement system.

The total volume of payment items that pass through the national clearing and settlement system annually has continued to increase over the past five years, rising from 1.9 billion items during 1998 to 2.2 billion during 1992. These flows of payment items are divided into a number of different streams, some of them paper payment instruments - e.g. small and large cheques - some of them electronic - e.g. magnetic tape debits and automated-banking-machine (ABM) and point-of-sale (POS) interchange transactions. While the flows of paper payment instruments remain larger, in terms both of volume and value, than the flows of electronic items, during 1991 and 1992 the flow of all paper items fell below that of the previous year. In contrast, the flow of all electronic items continued to grow at a rapid rate, increasing from 8.8% of the total volume of all the payment items that passed through the national clearing and settlement system during 1988 to 19.5% during 1992.

Data on the volume and value of the payment items that were handled by the national clearing and settlement system between 1988 and 1992 are presented in Table 8 and Table 9 respectively.

## 3.2 Structure, operation and administration of major large-value systems

### *3.2.1 Background*

The flow of large-value payments in Canada - i.e. all payments of Can.$ 50,000 and above - averaged some Can.$ 68.1 billion (US$ 56.4 billion) per day during 1992, representing 93.4% of the value recorded by the Automated Clearing and Settlement System (ACSS). The volume of large-value payments in Canada amounted to some 27,500 items per day on average during 1992. This flow of large-value payments can be divided into three broad categories of payments: first, international payments, which accounted for approximately one-quarter of the value of the total; second, payments that reflected transactions in the Canadian securities markets, which accounted for about 20% of the value of the total; and, third, a heterogeneous flow of commercial and governmental payments. International payments, which are now often netted, were typically sent via the Interbank International Payment System (IIPS). The payments that are associated with securities market transactions generally take the form of certified cheques. However, the anticipated introduction of the multilateral netting of such payments within The Canadian Depository for Securities Limited (see Section 4.2.1 below) could significantly reduce both the value and the volume of these payments over the coming years. Lastly, the heterogeneous flow of large commercial and governmental payments employs a variety of payment instruments, principally the paper cheque. These payments are cleared and settled for in the manner described in Section 3.1.2 above. The CPA is currently developing an electronic credit transfer system that will gradually come to carry the great majority of large-value payments in Canada (see Section 3.3 below). The present section, however, focuses on the IIPS, which is the only operational large-value transfer system in Canada at the present time.

The purpose of the IIPS is to facilitate correspondent banking transactions, third-party international transactions, third-party domestic payments of large value, and the settlement of transactions in the domestic interbank deposit market. All transactions are denominated in Canadian dollars.

The IIPS began operations in October 1976. Since that time there has been a migration from the use of telex to the use of S.W.I.F.T. messages, and the number of participants has increased to include certain Canadian subsidiaries of foreign banks and non-bank Direct Clearers.

The average annual rate of growth of IIPS transactions has been estimated to have been about 17% since 1988. The average daily volume, as surveyed in 1992, was about 7,000 payments, or some 1.8 million transactions per year. The average value per payment was about Can.$ 5 million

(US$ 4.1 billion). Approximately Can.$ 10 trillion (US$ 8.3 trillion) is transferred via the system annually.

### *3.2.2 Major legislation, regulations and policies*

There are a number of Acts, regulations and procedural rules that govern, directly and indirectly, the operations of the IIPS. The major ones are the Canadian Payments Association Act (see Section 3.1.1 above), the clearing by-law of the CPA (see Section 2.2.2 above), the Automated Clearing Settlement System Users' Guide of the CPA, the Standards and Procedures Manual of the Canadian Bankers Association (CBA), and the Rules Governing Advances to Financial Institutions of the Bank of Canada.

The rules that govern participation in the IIPS stipulate that participants must be S.W.I.F.T. users within Canada. Participants become members of the CBA's IIPS Direct Participants' Group, which establishes operating procedures for the IIPS. (Settlement procedures are established in significant part pursuant to the CPA's clearing by-law.) There is also a volume criterion - viz. that participants send at least 50 outgoing payment messages per day. No separate criteria are applied to the Canadian subsidiaries of foreign banks that wish to participate in the system.

Transactions that flow through the IIPS are restricted in principle to payments of at least Can.$ 50,000 in the case of domestic third-party payments. Other eligible payments are not subject to a value restriction. The deadline for the submission of payments is 2.30 p.m. for third-party payments and 4 p.m. for interbank payments.[14]

### *3.2.3 Participants*

There are no owners of the IIPS. The operations are spread among the twenty-three direct participants that follow the various rules and procedures of the system.

The direct participants in the IIPS are: the Bank of Canada; the seven chartered banks that are Direct Clearers; thirteen Canadian subsidiaries of foreign banks; a trust company; and La Caisse centrale Desjardins du Québec. There are also forty-four indirect participants, forty-two of which are chartered banks and two trust companies.

The role of deposit-taking institutions in the IIPS is to facilitate credit transfers and to participate in the settlement process. The clearing house is the ACSS of the CPA; the other principal service provider is S.W.I.F.T., which carries virtually all the payment messages.

### *3.2.4 Types of transaction handled*

Of the approximately 7,000 messages that flow through the IIPS daily, the majority are from correspondent banks. In many instances, these messages reflect non-resident, third-party payments for Canadian exports and the purchases of securities by non-residents. Between 100 and 200 messages per day relate to the domestic interbank deposit market, and at least 500 are domestic third-party items. All these transactions begin as credit transfer messages

### *3.2.5 Operation of the transfer system*

As noted in Section 3.2.3 above, the participants in the IIPS use S.W.I.F.T., with telex backup, to send credit transfer messages. Under the traditional settlement procedures, which are now being used less and less often, the receiving participant creates a paper document called an

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14 The times for the submission of payments are "the local times at the receiving IIPS point or the beneficiary account point, whichever is earlier".

"inter-member debit voucher" and delivers it in the regular daily exchanges of all payment items to the sending participant. Under this procedure, one voucher is created for each transfer. Such vouchers are delivered to the sending participant in batches, the value and volume counts of which are entered into the ACSS. Five large chartered banks have, since late 1992, been netting IIPS messages bilaterally.[15] The net "payee" bank creates a debit voucher in the net amount calculated and delivers it in the regular daily exchanges of all payment items to the "payer" bank. The Bank of Canada debits or credits the settlement account of each Direct Clearer in accordance with the ACSS results on the following afternoon at about 4 p.m. (Ottawa time) for value the preceding day.

It is expected that the IIPS will function smoothly. However, if the system were not available for a few hours, liability would be minimal so long as payments were processed on the appropriate value date. If the system were not available until after the value date, interest claims would be made under the relevant CPA rule.

### *3.2.6 Transactions-processing environment*

The credit transfers that are processed through the IIPS begin in electronic form and end in paper form. The level of technology varies from the sometimes manual production of inter-member debit vouchers to the relatively high degree of automation within the ACSS. Each transfer does, however, involve an electronic S.W.I.F.T. message.

The typical IIPS transaction begins with a non-resident payer sending a message to a foreign correspondent bank, which in turn sends the message to the Canadian sending participant, usually a chartered bank. The sending participant then transmits the message to the Canadian receiving participant, which, under one of the procedures for the exchange and settlement of IIPS messages, creates the appropriate inter-member debit voucher and sends it to the sending participant via the ACSS for settlement. The transaction is credited to the Canadian receiver of the payment on the value date and at a time of day that reflects the internal accounting cycle of the receiving participant.

### *3.2.7 Settlement procedures*

The rules that govern settlement within the IIPS are contained in the clearing by-law of the CPA and in sections of the CPA Rules Manual and the ACSS Users' Guide.

Unlike many large-value payment mechanisms in other developed countries, finality does not exist within the IIPS. Under the clearing by-law all paper payment items, including inter-member debit vouchers, must be returned by a defaulting sending participant in the day's clearing cycle. Availability of the payment to the receiver varies from participant to participant; however, funds are generally made available to the payment recipient during regular business hours on the value date.

If a payment has to be revoked, the procedures for the return of an interbank debit voucher are defined in the clearing by-law; however, there has been no experience with the return of IIPS payments.

Credit is implicitly generated within the IIPS when the receiving participant releases funds to a payee while still awaiting final settlement following the evening delivery of the inter-member debit voucher to the sending participant. These credit-creation processes are not always monitored within the day at the present time. Moreover, the Bank of Canada could extend credit to the

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15 The agreements between IIPS participants for the bilateral netting of messages are, from a legal perspective, seen both as robust and as providing novation.
Recent amendments to the federal Bankruptcy and Insolvency Act and to the Canada Deposit Insurance Corporation Act support the enforceability of the netting of financial contracts by exempting listed contracts from a stay of creditors.

sending participant, should it be overdrawn at the end of the clearing cycle on the subsequent business day.

The Bank of Canada would generally grant credit to a participant if it incurred a substantial unforeseen loss during the clearing cycle that would result in the Direct Clearer either being overdrawn or having a negative cumulative excess computed settlement balance at the end of an averaging period. The loan would be made retroactively at about 3 p.m. (Ottawa time) on the business day following the value date. The loan would be large enough to eliminate the overdraft or negative cumulative settlement balance on the part of that Direct Clearer. All such loans have to be fully collateralised and typically are for only one business day.[16]

Each participant in the IIPS is exposed to credit risk amounting to the value of its receipts during the 24-hour period between the exchange of payments and the completion of retroactive settlement on the next business day. In a default situation, that exposure could be prolonged.

### *3.2.8 Pricing policies*

There are no references to pricing in the rules and regulations of the IIPS. The participants pay S.W.I.F.T. message fees and terminal costs; they also incur costs in the creation of the inter-member debit vouchers and the physical delivery of the vouchers and the costs associated with bilateral netting, where applicable. Participants pay for the ACSS indirectly through their contributions to the annual budget of the CPA and, similarly, for the costs related to the work of the CBA. The Bank of Canada incurs no additional direct costs but contributes its share of the CPA's budget. The Canadian deposit-taking institutions that use a direct participant as an agent and foreign correspondent banks negotiate their fee arrangements periodically with one of the direct participants. Such arrangements are shaped by market forces. Third-party payers pay transactions fees that are also determined by market forces.

### *3.2.9 Credit and liquidity risks*

#### *(a) Credit risk*

Credit risk is generated within the IIPS as gross claims on other sending participants accumulate throughout the day. Those claims may not in all cases be monitored by the receiving participants. In normal circumstances the overnight credit risk may be increased, reduced or eliminated by other - i.e. cheque-related - payment flows involving other participants. In a general default situation, however, the overnight credit risk could only be increased by the flows of other types of payment, because of the requirement to reverse payments made by cheques drawn on the defaulting deposit-taking institution.

To control credit risk, some of the participants now monitor bilateral net positions during the day. However, each participant must wait until the following morning to obtain the more relevant bilateral position based on the exchanges of all types of payments item. In addition to monitoring, there are other controls on credit risk. For example, the overnight loans by the Bank of Canada are collateralised, typically at the cost of Bank Rate.[17]

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16 For further background, see Donna Howard, "The Evolution of Routine Bank of Canada Advances to Direct Clearers", *Bank of Canada Review*, October 1992.

17 The Bank Rate is the minimum rate at which the Bank of Canada makes short-term advances to members of the Canadian Payments Association. During the period from November 1956 to 24th June 1962 and since 13th March 1980, the Bank Rate has been set at one-quarter of 1% above the weekly average tender rate on three-month Treasury bills. At other times, however, it has been administered directly by the Bank of Canada and changed from time to time.

***(b) Liquidity risk***

Liquidity risk has, on rare occasions, been generated within the IIPS by sporadic deficiencies in the supporting telecommunications infrastructure. It has also been created by receiving participants producing erroneous (or failing to produce) inter-member debit vouchers. The liquidity risk is managed by reopening the clearings and by ad hoc administrative actions by the Bank of Canada. Minimisation of liquidity risk is the responsibility of the comptrollers, cash managers and administrative staffs at each of the receiving participants.

### 3.3 Main projects and policies being implemented - the large-value transfer system

One of the shortcomings of the national clearing and settlement system is that it does not provide "finality of payment". This disadvantage arises from the processing lag in a primarily paper-based system that delays the final settlement of the clearings. Because of this delay, in addition to the potential for dishonoured items, there is a risk that a deposit-taking institution may be declared insolvent and, hence, default on the payments of all its clients. In such a situation, the daily settlement at the Bank of Canada would not take place in the usual way and, in fact, the clearings would have to be largely unwound. This unwinding could, in turn, have very serious consequences for the other deposit-taking institutions and their customers, creating potential "systemic risk" within the national clearing and settlement system.

Certainty and finality of settlement are, accordingly, important objectives of an electronic Canadian large-value transfer system (LVTS), because those conditions would permit deposit-taking institutions to provide finality of payment for the large-value payments of clients. LVTS funds received by customers who are involved in those large-value transactions would no longer be subject to reversal in the event of the failure either of the payer or of the payer's deposit-taking institution. Systemic risk would be reduced because, if a deposit-taking institution were to fail, the extent of a default would be limited in advance and be shared in a predetermined and manageable way. There would be no unwinding of the electronic transactions that move over an LVTS. Consequently, any potential unwinding of payment flows would be limited to the relatively modest residual value of paper-based transactions.

The Canadian Payments Association (CPA) has decided to give priority to creating an electronic payments system for large-value transactions. The Board of Directors of the CPA has agreed that an LVTS should have the following attributes:

- certainty of settlement - the assurance that, at the end of the daily clearing cycle, there will be appropriate transfers of value between the settlement accounts that are maintained by deposit-taking institutions at the Bank of Canada;
- irrevocability of settlement - settlements on the books of the Bank of Canada will never be reversed;
- finality of payment - irreversible credits can be made to the payee at a defined point in time. There will be no returns due to default or participant failure;
- integrity - systemic risk - i.e. the domino effects from the default of one participant - will be confined so that the surviving participants will be able to settle;
- risk control and allocation - although risk cannot be totally eliminated, the maximum total loss resulting from the failure of a participant must be specified in advance and be limited to that amount. Any formula for the allocation of loss among surviving parties must be clearly understood by all CPA member institutions;
- centralised control - a central facility must control the flow of transactions between the participants and ensure that limits are not exceeded.

The current proposal for the Canadian LVTS is based upon a considerable amount of work that was done during 1992 and early 1993 by the CPA. The topics of risk control, access criteria and systems development were addressed. During March 1993 the Board of Directors of the CPA presented the high-level architecture for the LVTS to the four relevant agencies of the federal government - the Department of Finance, the Office of the Superintendent of Financial Institutions, the Canada Deposit Insurance Corporation, and the Bank of Canada - and received support for the approach being proposed.

Settling participants will probably have to satisfy a number of access criteria, including being a member of the CPA, being a S.W.I.F.T. user within Canada, and being technically competent. The CPA has estimated that there might be between twenty-five and thirty settling participants in the LVTS.

With respect to risk control, it is contemplated that the activity of each settling participant within the LVTS would be subject to a multilateral debit cap. The amount of a settling participant's net debit cap would be a function of the amount of collateral that it had put up and the amount of the bilateral lines that had been extended to it by other participants. If a settling participant were to be declared insolvent, a risk-sharing formula would be used to cover any multilateral net debit of the defaulting participant.

The risk-sharing formula that has been proposed by the CPA, and tentatively accepted by the four federal agencies, is a blend of the "defaulter-pays" and "survivors-pay" approaches to risk control. The defaulter-pays portion would be backed 100% by the pledging of high-quality securities before the day's activity began. The survivors-pay portion of the formula would require a deposit-taking institution, in the event of the default of another settling participant, to be responsible for a proportion of the resulting LVTS clearing loss, and this portion would be fully collateralised.

The loss share of each surviving participant would be equal to the amount of the bilateral line that it had extended to the defaulting settling participant divided by the total amount of all bilateral lines that had been extended to the defaulting participant on that day. Consequently, there would be a strong incentive for the settling participants to perform careful credit analyses and to vary their bilateral lines accordingly. In the extreme, a settling participant that was concerned about the viability of another participant would be able to avoid all exposure by not granting a bilateral line to that participant at all. Nevertheless, any settling participant could continue to function in the LVTS on a 100% defaulter-pays basis.

The interaction of the formulas for the multilateral net debit caps and for risk-sharing, together with the collateral requirements, are such that there would always be sufficient collateral and funds to cover the largest possible multilateral net debit of a defaulting settling participant. As a result, each and every LVTS transfer would be irrevocable and would gain certainty of settlement with respect to consequent changes on the books of the Bank of Canada as soon as the transfer had passed the various cap tests. The settlement accounting at the Bank of Canada is expected to take place during the early evening, and it will involve irrevocable entries, as provided for in a new CPA clearing by-law.

Much work still needs to be done to implement an LVTS in Canada. While there is general agreement within both the Board of Directors of the CPA and the federal government on the broad framework for an LVTS, there are still some complex questions of detail to be worked out - e.g. at which point during the daily clearing cycle could collateral that had been pledged be released? These questions are currently being addressed and resolved by sub-committees of the CPA's Board.[18]

18 See Section 5.2.7 below for a summary of the risk-reduction policy of the Bank of Canada.

# 4. SPECIAL USE OF INTERBANK TRANSFER SYSTEMS FOR INTERNATIONAL AND DOMESTIC FINANCIAL TRANSACTIONS

## 4.1 Exchange and settlement systems for international transactions

### *4.1.1 General overview*

Large Canadian deposit-taking institutions, both chartered banks and trust and loan companies, have had an active and extensive presence abroad for many years, and a number of foreign banks have established wholly-owned subsidiaries in Canada since the 1980 revision of the Bank Act. Moreover, Canadian cooperative credit institutions have both business and fraternal links with similar institutions in other countries.

The international transfer of both small and large-value payments is effected primarily through correspondent banking relationships. In some instances those relationships are based upon ownership links, while in others the relationship is a purely commercial one.

The principal means by which large-value payments are transmitted internationally by Canadian deposit-taking institutions is S.W.I.F.T.. In Canada, membership in S.W.I.F.T. is open to those deposit-taking institutions that are also members of the Canadian Payments Association.

### *4.1.2 Retail transactions*

There are several means by which cross-border transactions can be effected by individual Canadians - credit cards issued by Canadian deposit-taking institutions and by certain retailers; international money orders and banker's drafts; travellers' cheques; and the services offered by the Cirrus and Plus networks of automated banking machines. It is also not uncommon for Canadians to use a cheque in US dollars drawn on a Canadian dollar account maintained at a Canadian deposit-taking institution to pay a bill or invoice that has been issued by a US entity. The exchange of such items has been carried out for several years using the US Bulk Exchange system of the Canadian Payments Association.

### *4.1.3 Large-value transfers*

Large-value transfers in Canadian dollars, in settlement of international transactions, take place through the Interbank International Payment System (see Section 3.2 above). Large-value transfers in other currencies take place through clearing and settlement systems abroad by way of correspondent banks that are members of those systems.

The six largest Canadian chartered banks have been working with two US commercial banks and International Clearing Systems, Inc. to establish a multilateral foreign exchange netting facility,[19] subject to the oversight of the Bank of Canada, the Federal Reserve Board and the Federal Reserve Bank of New York.

## 4.2 Exchange and settlement systems for securities transactions

### *4.2.1 The Canadian Depository for Securities Limited*

The Canadian Depository for Securities Limited (CDS) was incorporated in 1970 under federal law as a private company. CDS is owned by some of the principal institutions within the

19 International Clearing Systems, Inc. is a wholly-owned subsidiary of the Options Clearing Corporation.

Canadian financial community, with representatives of major Canadian chartered banks, trust companies and investment dealers each holding one-third of the CDS common shares. The chief objective of CDS is to contribute to the improved efficiency of the financial sector of the Canadian economy through the provision of automated facilities for the clearing and settlement of securities transactions.

At the present time, CDS receives and processes information on debt and equity transactions using a batch-based computer system and sends reports to participants on their delivery and payment obligations, as calculated by CDS. Each participant makes a net payment to, or receives a net payment from, CDS in each of the two daily settlement cycles. Participants can make book-entry deliveries without the physical movement of certificates, which reduces the need for participants to maintain a physical stock of securities certificates, and therefore cuts the costs of safekeeping and record-keeping, and eliminates the messenger and banking costs of certificated deliveries. Deliveries between participants can also be made on a certificated basis, using CDS as a clearing house for physically receiving and delivering envelopes containing securities certificates.

The value of debt and equity securities held on deposit at CDS on 31st October 1992 was Can.$ 465 billion. During 1992 6.7 million transactions involving debt and equity securities were processed through CDS.

The existing system cannot support the processing of money market transactions that involve same-day settlement. Accordingly, towards the end of the 1980s, the strategic direction of CDS for the 1990s included the implementation of a new debt and money market service and of an equity service based on an on-line real-time computer system with modern database architecture. In the new services, securities ownership will be transferred on a transaction-by-transaction basis and payments to and from CDS will be made at the end of the day on a net basis. The major deposit-taking institutions will be involved in the processing of the day-end payments; appropriate risk-containment measures, including the use of collateral, will assure settlement.

Government of Canada domestic marketable bonds will be the first securities to be made eligible for the new Debt Clearing Service (DCS). This first step in the implementation of the DCS will involve the conversion of the positions of all participants, which are currently held in the batch-based system, to the new on-line system. About Can.$ 165 billion will be converted in this manner. Once Canada bonds have been made eligible for the DCS, the plan calls for other types of debt security and money market instruments to follow - Treasury bills, bankers' acceptances, bearer deposit notes, commercial paper, provincial and municipal bonds and notes, corporate bonds, term deposits, and guaranteed investment certificates.

The risk-containment mechanisms that are required by the authorities for the first phase of the DCS (involving Government of Canada bonds) have been agreed to in principle, and these mechanisms will be in place before the DCS start-up for Canada bonds. Some risk-containment measures will need to be enhanced before federal Treasury bills and other types of security are declared eligible for DCS. The risk-containment mechanisms, which include the capping of net obligations and the pledging of collateral by participants to CDS, are intended to protect CDS from the failure of the participant with the single largest net obligation to CDS. In the event of a default, the collateral can be used to ensure settlement of that day's transactions and to cover any losses to the clearing house arising from the default. The introduction of the large-value transfer system (see Section 3.3 above) will probably result in the simplification of the risk-containment procedures within CDS.

Once the DCS has been implemented, it is the intention of CDS to introduce a new Equity Clearing Service (ECS) based on the same technological platform. The current plan is to introduce this service after debt and money market instruments have been immobilised within the DCS.

#### *4.2.2 Trans Canada Options Corporation*

The process for clearing and settlement is essentially the same for all derivatives that are traded on organised exchanges in Canada.

All derivative contracts that are traded on Canadian exchanges are issued by the Trans Canada Options Corporation (TCO), an organisation that was established by the exchanges in 1976 for the purpose of acting as the issuer and primary obligor of and as the clearing facility for transactions in derivatives. A buyer relies upon TCO rather than upon any particular writer (seller) for delivery. Similarly, the obligation of a writer is to TCO rather than to the buyer. TCO has designed procedures for settlement so that, for every outstanding option or futures contract, there will be a writer and a Clearing Member representing the writer.[20]

All trades must be executed by an investment dealer on the floor of an exchange. Once the trade is done, the two dealers meet on the floor to initial the trade and the selling dealer reports the trade using the floor terminal. The settlement period for the payment of the premiums is one day. The matching of trades is done by the exchange and, by initialling the trade, the buyer in essence confirms the trade for settlement.

The trade information is sent by a computer-to-computer link between the exchanges and TCO for processing. TCO processes the trades overnight and puts out a report to the Clearing Members the next morning before the exchanges open. TCO in effect cancels the bilateral agreement between the buyer and the seller of the contract and replaces it by two separate contracts with TCO. In the case of a call option, the buyer of the call is guaranteed delivery by TCO, and the writer of the call agrees to deliver to TCO if the buyer decides to exercise his right.

The clearing and settlement system nets out, for each Clearing Member, the premiums and the margin liabilities to a net amount due to or due by TCO. The payment is due by 8 a.m. in order to precede the opening of the exchanges. The Clearing Members are required to maintain accounts at several chartered banks that are involved in the settlement of TCO contracts. Based upon prior agreements with the banks and the Clearing Members, TCO debits and credits the accounts appropriately. These debits and credits are only accounting entries on the books of the banks; they do not involve an exchange of cheques through the national clearing and settlement system.

## 5. THE ROLE OF THE CENTRAL BANK IN INTERBANK SETTLEMENT SYSTEMS

### 5.1 General responsibilities

#### *5.1.1 Statutory responsibilities*

Apart from the rather general provisions of the Canadian Payments Association Act (see Section 3.1.1 above), there is no specific legislative framework that directly governs the operations of any of the clearing and settlement systems that exist in Canada. Moreover, although that Act requires that an officer of the Bank of Canada be appointed both a Director of the Canadian Payments Association and the Chairman of the Association's Board of Directors, the Bank itself has no specific statutory responsibilities in connection with clearing and settlement systems.

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20 A Clearing Member of the TCO must be a member of the Toronto Stock Exchange, the Montreal Exchange, the Vancouver Stock Exchange, or the Toronto Futures Exchange. No other entities are allowed to use the TCO's clearing and settlement system.

The Bank of Canada does, however, have an obvious interest in the efficiency, reliability and integrity of these systems. Stable and efficient financial markets and smoothly functioning clearing and settlement systems are vital to the efficient conduct of monetary policy by the Bank of Canada. Indeed, it is the Bank of Canada's control over the ultimate means of settlement in the economy that is the crucial lever of monetary policy. This control over settlement balances also means that the Bank of Canada has a responsibility as lender of last resort to the financial system. Clearing and settlement systems, by their very nature, concentrate activity by linking all participants together through a clearing house. As a result, these systems have the potential to transmit problems from one participant to others or, worse still, to other systems and markets and, thus, to threaten the stability of the financial system generally. Problems in a poorly designed clearing and settlement system could lead to large and unexpected requirements for liquidity support from the Bank of Canada.

### *5.1.2 Establishment of common rules*

The rules that govern the operations of each Canadian clearing and settlement system are established by their members through the relevant entity - e.g. the Canadian Payments Association and The Canadian Depository for Securities Limited.

As a Direct Clearer, the Bank of Canada is a member of the National Clearings Committee of the Canadian Payments Association (CPA), which is responsible for maintaining an ongoing review of the inter-member procedures, standards and practices for the exchange of paper-based and electronic data within the national system for the clearing and settlement of payments (see Section 1.4.1 above). The Bank also takes part in the work of other CPA committees that have been established to develop standards, procedures and guidelines for new, typically electronic payment mechanisms - e.g. electronic funds transfer at the point of sale and the Canadian large-value transfer system (see Section 3.3 above). The Bank of Canada is also a direct participant in the Interbank International Payment System (IIPS) and, accordingly, is a member of the IIPS Direct Participants' Group, which is currently responsible for establishing and maintaining the operating procedures for that particular clearing and settlement system (see Section 3.2 above).

The Bank of Canada, in its role as the fiscal agent of the federal government and as a potential participant, has cooperated with major segments of the Canadian financial community in the development of the Debt Clearing Service of The Canadian Depository for Securities Limited (see Section 4.2.1 above).

Finally, the actions of the Bank of Canada with respect to the North American clearing house for foreign exchange transactions had their origins in the "Principles for Cooperative Central Bank Oversight" that were set forth in the Report of the Committee on Interbank Netting Schemes of the Central Banks of the Group of Ten Countries, the so-called "Lamfalussy Report".

### *5.1.3 Audit and supervision of interbank funds transfer systems*

There is no statutory or other requirement in Canada for the audit or supervision of clearing and settlement systems. The Canadian Payments Association Act does, however, require that the Superintendent of Financial Institutions - the supervisor of federally incorporated financial institutions - report annually to the federal Minister of Finance whether or not the Canadian Payments Association is operating in conformity with its Act and by-laws. Moreover, the Superintendent has oversight of the participation of financial institutions in private sector clearing mechanisms.

The Canadian Payments Association, the Canadian Bankers Association and The Canadian Depository for Securities Limited are all incorporated entities, and their accounts are, therefore, subject to an annual financial audit.

## 5.2 Provision of settlement facilities

### *5.2.1 Use of central bank accounts for payment services*

All chartered banks are eligible to open reserve deposit and securities safekeeping accounts with the Bank of Canada.[21] In the instance of a chartered bank that elects to hold its reserves with the Bank of Canada, a deposit account is required for that purpose. (In practice, however, only those chartered banks that are Direct Clearers and a small number of wholly-owned Canadian subsidiaries of foreign banks have opened deposit accounts with the Bank of Canada, the latter largely as a matter of corporate policy.) A chartered bank that elects to hold its reserves with another chartered bank may, however, wish to lodge Government of Canada securities with the Bank of Canada for safekeeping and, accordingly, may open a securities safekeeping account with the Bank.

Although every non-bank deposit-taking institution that is a member of the Canadian Payments Association is eligible to open settlement and securities safekeeping accounts with the Bank of Canada, only those that are Direct Clearers have actually done so.

The Bank of Canada requires formal authority from each deposit-taking institution - bank or non-bank - that wishes to open an account with it. This authority takes the form of a deposit account agreement signed by the officers of the institution in question.

### *5.2.2 Role in gross settlement systems*

All Canadian clearing and settlement systems operate on a net settlement basis at the present time.

### *5.2.3 Relation with netting systems*

The role of the Bank of Canada in the national clearing and settlement system and in the Interbank International Payment System, in addition to being a direct participant, is that of the settlement institution, holding the accounts through which the positions of the other direct participants in the clearings are finally settled.

### *5.2.4 Role in the settlement of securities transactions*

The role of the Bank of Canada in the settlement of securities market transactions is that of the source of final settlement in the payment clearings. Settlement in respect of a securities transaction becomes final when the daily changes are made to the settlement accounts of the Direct Clearers on the books of the Bank of Canada following the daily exchange of payment items.

### *5.2.5 Provision of credit facilities*

The Bank of Canada routinely extends secured loans or advances to Direct Clearers in order to cover temporary deficits in their cash positions.

From 1935, when the Bank of Canada began operations, until the mid-1950s, the use of central-bank credit was rare, since the chartered banks generally maintained cash reserves well in excess of their requirements. During the 1960s, 1970s and 1980s, the Bank discouraged frequent and excessive borrowing through its rules governing advances. The use of advances to cover overdraft positions did, however, increase during the 1980s as non-bank deposit-taking institutions, which were

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21 Chartered banks will no longer be required to hold reserves against their deposit liabilities once a phase-out of statutory reserve requirements has been completed in July 1994.

not subject to reserve requirements, became Direct Clearers and as the level of deposits that chartered banks were required to hold at the Bank of Canada declined. With the movement towards a system with zero required reserves, a new framework for the implementation of monetary policy was introduced on 18th November 1992. Under this new framework, the Bank of Canada no longer restricts the frequency of advances or loans through moral suasion. Instead, price incentives have been incorporated into the framework to encourage the appropriate money market response by Direct Clearers to changes in the supply of settlement balances.[22]

#### *5.2.6 Pricing policies*

The pricing policy of the Bank of Canada is based on the principle of recovering the cost to the Bank of the provision of banking services by charging fees for those services where appropriate.

#### *5.2.7 Risk-reduction policies*

The Bank of Canada believes that three basic components are essential for the establishment of effective arrangements to contain systemic risk within a particular clearing and settlement system.[23] The first component is a ceiling on the net payments debit of each individual participant, so that the risk each participant brings to the system is limited. The second component is the existence of explicit, legally binding rules for the allocation of any losses in the event of the failure of a participant. When such loss-allocation rules are based on the maximum exposure of an individual participant to the other participants in the system, they provide a helpful, additional incentive to limit risk. The loss-allocation rules should also require the pledging of collateral in order to secure liquidity and loss-sharing arrangements so that there is certainty that the settlement of payments will take place at the end of the day, even if a failure were to occur. The third and final component is some form of oversight to monitor participants and to ensure adherence to the ceilings and the loss-allocation rules. It is also untenable for the integrity of a new clearing and settlement system to be based on the presumption that there are participants that, for whatever reason, cannot fail.

### 5.3 Monetary policy and payment systems

#### *5.3.1 Existing relationships*

The objective of monetary policy in Canada is to maintain confidence in the value of the nation's money by fostering stability in the general level of prices. In deciding on monetary policy actions, the Bank of Canada analyses a range of financial and economic variables, including trends in money, credit and total spending, the behaviour of costs and prices, and the ability of the economy to expand production to meet demand.

The Bank of Canada implements monetary policy on a day-to-day basis by controlling the quantity of settlement balances used by the Direct Clearers for the clearing and settlement of cheques and other payment items. The mechanism that is used by the Bank to adjust the quantity of settlement balances involves the transfer of deposits of the federal government between the

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22 For further background, see Donna Howard, "The Evolution of Routine Bank of Canada Advances to Direct Clearers", *Bank of Canada Review,* October 1992.

23 See John W. Crow, "What Makes a Good Payments System?", Comments for a panel discussion by the Governor of the Bank of Canada at the Third Annual Conference of The Canadian Bankers' Association, *Bank of Canada Review*, June 1992, and *idem*, "Clearing and Settlement of Financial Transactions: A Perspective from the Bank of Canada", Notes for Remarks by the Governor of the Bank of Canada at the Eighth Annual Cash and Treasury Management Conference of the Treasury Management Association of Canada, *Bank of Canada Review,* November 1990.

government's account at the Bank of Canada and the accounts it maintains at Direct Clearers. A transfer of deposits from the Direct Clearers to the Bank of Canada reduces, all other things being equal, the supply of settlement balances; a transfer from the Bank to the Direct Clearers increases the supply of balances. By providing a greater (smaller) amount of settlement balances than desired by the Direct Clearers, the Bank of Canada can induce a decrease (an increase) in very short-term interest rates.

The Bank of Canada can also exert a direct influence on interest rates through discretionary sales or purchases of Government of Canada securities. For example, the Bank can affect the overnight rate by offering to buy (sell) securities with an agreement to sell them back (repurchase them) the following day. The Bank of Canada may also buy and sell Treasury bills outright to affect the three-month rate. The changes in the settlement balances of the Direct Clearers that result from these transactions are typically neutralised through the transfer of federal government deposits between the Bank of Canada and the Direct Clearers.

### *5.3.2 Influence of changes in payment systems on monetary policy*

The relationship between the operations of monetary policy and developments within the Canadian payments system is kept under review by the Bank of Canada.[24] For example, when the large-value transfer system (see Section 3.3 above) becomes operational and as paper payment items increasingly migrate to that system, the cash managers of major Canadian deposit-taking institutions will have information much earlier than at present on the clearing gains or losses of their respective institutions, influencing the demanded level of settlement balances that are held by those institutions at the Bank of Canada.

## 5.4 Main projects and policies being implemented

The Bank of Canada is currently involved in three major initiatives - the development of the Canadian large-value transfer system (see Section 3.3 above), the development of the Debt Clearing Service of The Canadian Depository for Securities Limited (see Section 4.2.1 above), and the establishment of a multilateral foreign exchange netting facility.

24 For further background on the implementation of monetary policy in Canada, see Donna Howard, "The Evolution of Routine Bank of Canada Advances to Direct Clearers", *Bank of Canada Review*, October 1992, and Bank of Canada, Discussion Paper No. 3, "The Implementation of Monetary Policy in a System with Zero Reserve Requirements", 1st May 1991, published in the *Bank of Canada Review*, May 1991. (Revised 6th September 1991; marginal revisions published in the *Bank of Canada Review*.)

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Table 1

**Basic statistical data**

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Population (millions): | | | | | |
| *year-end* ..... | *26.0* | *26.4* | *26.8* | *27.2* | *27.5* |
| GDP (CAD billions) ..... | 605.9 | 650.8 | 671.0 | 676.0 | 688.5 |
| GDP per capita ..... | 23,303.8 | 24,651.5 | 25,037.3 | 24,852.9 | 25,036.4 |
| Exchange rate (domestic currency vis-à-vis USD): | | | | | |
| *year-end*[1] ..... | *1.1925* | *1.1585* | *1.1599* | *1.1555* | *1.2709* |
| *average*[2] ..... | *1.2309* | *1.1842* | *1.1668* | *1.1458* | *1.2083* |

[1] Closing spot rate for the year. [2] Average noon spot rate for the year.

Table 2

**Settlement media used by non-banks**

(at year-end, not seasonally adjusted, in millions of Canadian dollars)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Notes and coin ..... | 17,934 | 19,108 | 19,777 | 21,051 | 22,790 |
| Narrow money supply ($M_1$) ..... | 40,177 | 41,215 | 40,431 | 42,180 | 45,374 |
| *Memorandum item:* | | | | | |
| Broad money supply ($M_2$+) ..... | 396,512 | 453,924 | 496,048 | 531,318 | 556,114 |
| Transferable deposits[1] ..... | | | | | |
| *of which held by:* | | | | | |
| *households* ..... | *90,947* | *98,475* | *97,787* | *103,950* | *108,560* |
| *corporate sector* ..... | *287* | *508* | *471* | *386* | *382* |
| *other*[2] ..... | *19,263* | *18,496* | *18,382* | *17,173* | *18,408* |

[1] Canadian dollar deposit liabilities only. [2] Including non-deposit-taking financial institutions.

Table 3

**Settlement media used by credit/deposit-taking institutions**

(at year-end, in millions of Canadian dollars)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Reserve or settlement balances held at central bank | 2,239 | 1,864 | 1,721 | 1,433 | 1,201 |
| Reserve or settlement balances held at other deposit-taking institutions[1] | 160 | 149 | 139 | 118 | 112 |
| *Memorandum items:* | | | | | |
| Required reserves | 5,523 | 5,454 | 5,391 | 5,466 | 5,225 |
| Institutions' borrowing from central bank[2] | 168 | 62 | 79 | 298 | 155 |

[1] Statutory reserves held by chartered banks at other chartered banks under the terms of reserve-holding agreements. Excludes settlement balances held by non-bank Indirect Clearers at their clearing agents. [2] Advances to members of the Canadian Payments Association.

Table 4

**Banknotes and coin**

(at year-end, not seasonally adjusted, in thousands of Canadian dollars)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Total banknotes and coin outstanding | 21,032,474 | 22,092,574 | 22,969,595 | 24,481,429 | 25,609,234 |
| Coinage | 1,761,296 | 2,112,385 | 2,241,369 | 2,285,703 | 2,369,270 |
| Denomination of banknotes:[1] | | | | | |
| *1,000 dollars* | *1,237,059* | *1,343,758* | *1,380,135* | *1,512,989* | *1,764,341* |
| *500 dollars* | *23* | *23* | *23* | *23* | *23* |
| *100 dollars* | *6,674,151* | *7,274,605* | *7,676,995* | *8,470,370* | *9,446,389* |
| *50 dollars* | *3,102,066* | *3,306,316* | *3,436,616* | *3,649,557* | *3,768,243* |
| *25 dollars* | *46* | *46* | *46* | *46* | *46* |
| *20 dollars* | *7,325,716* | *7,578,850* | *7,936,798* | *8,199,334* | *8,117,219* |
| *10 dollars* | *1,296,739* | *1,295,574* | *1,166,303* | *1,158,192* | *1,104,404* |
| *5 dollars* | *725,851* | *708,192* | *785,781* | *891,388* | *798,979* |
| *2 dollars* | *317,654* | *376,987* | *402,933* | *418,493* | *430,334* |
| *1 dollar* | *340,255* | *195,350* | *171,534* | *168,164* | *166,383* |
| *Other* | *12,873* | *12,873* | *12,873* | *12,873* | *12,873* |
| Banknotes held by deposit-taking institutions[2] | 4,428,136 | 4,352,603 | 4,972,428 | 5,389,586 | 4,640,831 |
| Total banknotes outside deposit-taking institutions | 16,604,338 | 17,739,971 | 17,997,167 | 19,091,843 | 20,968,403 |

[1] Value of all notes outstanding at the end of the year. [2] Value of notes held by chartered banks. Excludes value of notes held by non-bank deposit-taking institutions.

Table 5

**Institutional framework**

(at end-1992)

| Categories | Number of institutions | Number of branches | Number of transferable deposit accounts (millions) | Value of transferable deposit accounts (CAD millions) |
|---|---|---|---|---|
| Central bank ..... | 1 | 9 | . | . |
| Chartered banks ..... | 68[1] | 7,764 | . | 80,557 |
| Local credit unions and caisses populaires ..... | 2,615 | 3,919 | . | 14,355 |
| Trust and loan companies ..... | 98[2] | 2,022 | . | 11,383 |
| Governmental savings institutions ..... | 2[3] | 174 | . | 2,264 |
| Post Office ..... | . | . | . | . |
| *Memorandum item:* | | | | |
| Branches of foreign deposit-taking institutions .. | | . | | |

[1] Six operate nationwide. [2] Only a few operate nationwide and not all accept transferable deposits. [3] Operate only in Alberta or Ontario.

Table 6

**Cash dispensers, ATMs and EFTPOS terminals**[1]

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Cash dispensers and ATMs: | | | | | |
| Number of networks ..... | 40 | 40 | 40 | 40 | 40 |
| Number of machines[2] ..... | | | | | |
| ***Total*** ..... | *6,300* | *9,120* | *11,730* | *13,175* | *14,596* |
| *of which:* | | | | | |
| *Owned by member institutions of the Canadian Payments Association* ..... | *6,176* | *8,970* | *11,708* | *13,154* | *14,576* |
| *Owned or operated by other entities* ..... | *124* | *150* | *22* | *21* | *20* |
| Volume of transactions (millions): | | | | | |
| ***Total*** ..... | *656.6* | *755.3* | *786.9* | *941.5* | *1,024.8* |
| *of which*: | | | | | |
| *Withdrawals* ..... | *461.7* | *536.7* | *560.1* | *689.6* | *757.4* |
| *Deposits* ..... | *91.0* | *105.8* | *110.9* | *122.4* | *124.0* |
| *Bill payments* ..... | *25.8* | *22.1* | *25.2* | *28.4* | *32.6* |
| *Inter-account transfers* .... | *32.5* | *37.8* | *36.4* | *44.3* | *50.6* |
| *Balance inquiries* ..... | *45.6* | *52.9* | *54.3* | *56.8* | *60.2* |
| Value of transactions (CAD billions): | | | | | |
| *Withdrawals* ..... | *27.2* | *33.3* | *35.8* | *44.8* | *50.7* |
| *Deposits* ..... | . | . | . | . | . |
| *Bill payments* ..... | *1.9* | *1.7* | *1.9* | *2.1* | *2.8* |
| *Inter-account transfers* .... | . | . | . | . | . |
| *Balance inquiries* ..... | . | . | . | . | . |
| EFTPOS: | | | | | |
| *Number of networks* ..... | *4* | *7* | *10* | *11* | *11* |
| *Number of terminals* ..... | *873* | *4,287* | *9,250* | *13,300* | *29,600* |
| *Volume of transactions (millions)* ..... | *0.4* | *2.4* | *3.3* | *10.3* | *30.3* |
| *Value of transactions (CAD billions)* ..... | *0.0*[3] | *0.1* | *0.2* | *0.5* | *1.6* |

[1] All figures, other than those for the number of cash dispensers and ATMs owned by member institutions of the Canadian Payments Association, are estimates. [2] As at 31st January of the following year. 3 Insignificant.

Table 7

**Number of payment cards in circulation**

(at year-end, in millions[1])

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Debit cards issued by deposit-taking institutions | 14.0 | 15.0 | 16.3 | 17.5 | 18.5 |
| Credit cards issued by deposit-taking institutions[2,3] | 19.4 | 20.4 | 23.2 | 24.3 | 24.4 |
| Cheque guarantee cards issued by deposit-taking institutions | . | . | . | . | . |
| Cheque guarantee cards issued by retailers or by third parties | . | . | . | . | . |
| Credit cards issued by retailers or by third parties | 100.0 | 100.0 | 115.0 | 120.0 | 125.0 |

[1] All figures, other than those for credit cards issued by deposit-taking institutions, are estimates. [2] As at 31st October. [3] Between 50 and 60% of the credit cards issued by deposit-taking institutions can also be used by eligible cardholders to obtain cash from either their deposit or credit card accounts at automated banking machines.

Table 8

**Payment instructions handled by selected payment systems: volume of transactions**[1]

(in millions)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| National clearing and settlement system: | | | | | |
| *Small cheques* | *1,775.4* | *1,794.8* | *1,824.3* | *1,798.0* | *1,758.4* |
| *Large cheques (over CAD 50,000)* | *8.8* | *8.0* | *7.4* | *7.5* | *6.8* |
| *Unqualified*[2] | *11.0* | *12.3* | *11.9* | *12.3* | *11.0* |
| *Tape clearings*[3] | *6.0* | *6.7* | *6.4* | *5.8* | *3.2* |
| *EDI* | *0.0* | *0.0* | *0.0* | *0.0* | *1.6* |
| *Magnetic tape credits* | *54.9* | *66.5* | *77.3* | *87.2* | *98.7* |
| *Magnetic tape debits* | *47.9* | *59.0* | *76.7* | *97.2* | *122.1* |
| *Shared ABM networks* | *61.4* | *90.2* | *132.2* | *169.8* | *201.4* |
| *Point of sale* | *0.0* | *0.0*[4] | *0.4* | *2.1* | *6.0* |
| ***Total*** | *1,965.4* | *2,037.6* | *2,136.5* | *2,180.0* | *2,209.0* |
| Interbank International Payment System | 0.8 | . | . | 1.6 | 1.8 |

[1] Owing to the rounding of figures, components may not always add to the total shown. [2] Payment items either that have been returned principally because of insufficient funds in the payer's account or because of stop-payment orders or that do not meet the standards and specifications for MICR-encoded documents of the Canadian Payments Association. [3] Payment items that have had the relevant information stripped from them following sorting. The information is exchanged between Direct Clearers on magnetic tape on a bilateral basis at a limited number of Regional Settlement Points. The physical items are exchanged subsequently. [4] Insignificant.

Table 9

**Payment instructions handled by selected payment systems: value of transactions**[1]

(in billions of Canadian dollars)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| National clearing and settlement system: | | | | | |
| *Small cheques* | 969.9 | 1,023.4 | 1,058.6 | 1,015.0 | 1,014.6 |
| *Large cheques (over CAD 50,000)* | 13,609.4 | 15,576.4 | 16,242.2 | 16,939.3 | 17,125.0 |
| *Unqualified*[2] | 12.6 | 14.7 | 25.0 | 39.4 | 17.2 |
| *Tape clearings*[3] | 5.1 | 6.5 | 6.5 | 6.0 | 3.7 |
| *EDI* | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 |
| *Magnetic tape credits* | 54.6 | 67.9 | 83.7 | 102.6 | 126.4 |
| *Magnetic tape debits* | 9.7 | 14.4 | 18.3 | 24.0 | 31.9 |
| *Shared ABM networks* | 3.6 | 5.6 | 8.4 | 11.0 | 13.4 |
| *Point of sale* | 0.0 | 0.0[4] | 0.0[4] | 0.1 | 0.5 |
| ***Total*** | 14,665.0 | 16,709.0 | 17,442.9 | 18,137.6 | 18,333.8 |
| Interbank International Payment System | 3,500 | . | . | 7,500 | 10,100 |

[1] Owing to the rounding of figures, components may not always add to the total shown. [2] Payment items either that have been returned principally because of insufficient funds in the payer's account or because of stop-payment orders or that do not meet the standards and specifications for MICR-encoded documents of the Canadian Payments Association. [3] Payment items that have had the relevant information stripped from them following sorting. The information is exchanged between Direct Clearers on magnetic tape on a bilateral basis at a limited number of Regional Settlement Points. The physical items are exchanged subsequently. [4] Insignificant.

Table 10

**Transfer instructions handled by securities settlement systems: volume of transactions**

(for the twelve-month period ended 31st October)

| | 1989 | 1990 | 1991 | 1992 | 1993 |
|---|---|---|---|---|---|
| Number of trades reported to CDS[1,2] (millions) | 6.5 | 5.8 | 5.4 | 6.7 | 9.9 |
| *Memorandum item:* | | | | | |
| Value of eligible securities[3] (CAD billions) | 134 | 251 | 379 | 465 | 594 |

[1] The Canadian Depository for Securities Limited. [2] Consists of trades reported from the Toronto Stock Exchange and the Montreal Exchange and transactions between CDS member institutions. [3] Par value of debt securities plus market value of equity securities on deposit at CDS as at 31st October.

Table 11

**Transfer instructions handled by securities settlement systems: value of transactions**

(for the twelve-month period ended 31st October, in trillions of Canadian dollars)

| | 1989 | 1990 | 1991 | 1992 | 1993 |
|---|---|---|---|---|---|
| Value of settlement amounts (not nets) of trades[1] ..... | | | | | |
| ***Total*** ..... | . | . | . | . | *15.9* |
| *of which:* | | | | | |
| *Government of Canada domestic marketable bonds* ..... | . | . | . | . | *13.7* |
| *other* ..... | . | . | . | . | *2.2* |

[1] Consists of trade values reported from the Toronto Stock Exchange and the Montreal Exchange and both sides of transactions between CDS member institutions.

Table 12

**Indicators of use of various cashless payment instruments: volume of transactions**

(in millions; all figures are estimates)

| **Instruments** | **1988** | **1989** | **1990** | **1991** | **1992** |
|---|---|---|---|---|---|
| Cheques and other paper payment instruments issued ..... | 2,161.4 | 2,186.2 | 2,220.0 | 2,188.3 | 2,135.5 |
| Payments by credit card ... | 736.4 | 820.0 | 887.7 | 926.7 | 959.0 |
| Payments by debit card at the point of sale (EFTPOS) ..... | 0.4 | 2.4 | 3.3 | 10.3 | 30.3 |
| Paper-based credit transfers ..... | . | . | . | . | . |
| Paperless credit transfers | 91.7 | 101.9 | 117.9 | 133.0 | 151.0 |
| *customer initiated*[1] ..... | *25.8* | *22.1* | *25.2* | *28.4* | *32.6* |
| *interbank/large-value direct credits* ..... | . *65.9* | . *79.8* | . *92.7* | . *104.6* | . *118.4* |
| Direct debits ..... | 57.5 | 70.8 | 92.0 | 116.7 | 146.6 |
| **Total** ..... | 3,047.4 | 3,181.3 | 3,320.9 | 3,375.0 | 3,422.4 |

[1] Bill payments initiated at automated teller machines.

Table 13

**Indicators of use of various cashless payment instruments: value of transactions**

(in billions of Canadian dollars; all figures are estimates)

| Instruments | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Cheques and other paper payment instruments issued | 17,516.5 | 19,943.9 | 20,798.8 | 21,599.7 | 21,792.0 |
| Payments by credit card | 44.3 | 55.3 | 59.7 | 62.5 | 66.4 |
| Payments by debit card at the point of sale (EFTPOS) | 0.0[1] | 0.1 | 0.2 | 0.5 | 1.6 |
| Paper-based credit transfers | . | . | . | . | . |
| Paperless credit transfers | 67.4 | 83.2 | 102.3 | 125.2 | 154.4 |
| *customer initiated*[2] | *1.9* | *1.7* | *1.9* | *2.1* | *2.8* |
| *interbank/large-value direct credits* | *65.5* | *81.5* | *100.4* | *123.1* | *151.6* |
| Direct debits | 11.7 | 17.3 | 22.0 | 28.8 | 38.3 |
| **Total** | 17,639.9 | 20,099.8 | 20,983.0 | 21,816.7 | 22,052.7 |

[1] Insignificant. [2] Bill payments initiated at automated teller machines.

Table 14

**Participation in S.W.I.F.T. by domestic institutions**

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Members | 13 | 13 | 14 | 14 | 15 |
| *of which: live* | *12* | *13* | *14* | *14* | *13* |
| Sub-members[1] | 23 | 25 | 28 | 29 | 28 |
| *of which: live* | *21* | *23* | *26* | *27* | *27* |
| Participants[2] | 0 | 0 | 1 | 1 | 1 |
| *of which: live* | *0* | *0* | *0* | *1* | *1* |
| Total users | 36 | 38 | 43 | 44 | 44 |
| *of which: live* | *33* | *36* | *40* | *42* | *41* |
| *Memorandum items:* | | | | | |
| Total S.W.I.F.T.: | | | | | |
| *members* | *1,581* | *1,697* | *1,812* | *1,963* | *2,074* |
| *sub-members* | *1,228* | *1,315* | *1,469* | *1,607* | *1,738* |
| *participants* | *27* | *37* | *63* | *78* | *91* |
| *users* | *2,836* | *3,049* | *3,344* | *3,648* | *3,903* |

[1] Domestic users sponsored by members abroad. [2] Participants are not shareholders in S.W.I.F.T. and their message traffic over the network is restricted.

*Source*: S.W.I.F.T.

Table 15

**S.W.I.F.T. message flows to/from domestic users**

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Total messages sent ..... | 5,846,993 | 6,754,350 | 7,579,453 | 8,420,902 | 9,200,133 |
| *of which:* | | | | | |
| *category I*[1] ..... | *1,259,143* | *1,415,240* | *1,492,352* | *1,721,023* | *1,971,465* |
| *category II*[2] ..... | *2,209,954* | *2,479,377* | *2,754,512* | *3,028,624* | *3,241,260* |
| *of which:* | | | | | |
| *sent/received to/from domestic users* ..... | *1,730,221* | *2,043,229* | *2,298,169* | *2,544,210* | *2,808,125* |
| Total messages received ..... | 5,251,393 | 6,103,467 | 7,043,854 | 7,960,221 | 8,541,677 |
| *of which:* | | | | | |
| *category I*[1] ..... | . | . | . | . | *2,463,012* |
| *category II*[2] ..... | . | . | . | . | *3,444,189* |
| *Memorandum item:* | | | | | |
| Global S.W.I.F.T. traffic .. | 255,142,610 | 298,780,982 | 332,895,932 | 365,159,291 | 405,540,962 |

[1] Category I: customer (funds) transfers. [2] Category II: bank (funds) transfers.

*Source*: S.W.I.F.T.

**Methodology and sources used for the compilation of Tables 12 and 13**

The estimates of the volume and value of transactions effected by cheque and other paper payment instruments, paperless direct credit and direct debit are based on data generated by the Automated Clearing Settlement System of the Canadian Payments Association. The volume and value of transactions effected by credit card are estimated on the basis of data on the dollar sales and the number of sales vouchers processed for the two bank credit card plans that are collected by the Canadian Bankers Association. The estimates of the volume and value of EFTPOS transactions are taken from an informal annual survey of EFTPOS developments carried out by the Bank of Canada. Finally, the volume and value of bill payments initiated at ATMs are estimated on the basis of data on the volume of all types of transaction effected at cash dispensers and ATMs of chartered banks collected by the Canadian Bankers Association, figures from a semi-annual census of cash dispensers and ATMs conducted by the Canadian Payments Association, and an estimate of the average value of a bill.

# PAYMENT SYSTEMS IN FRANCE

# Table of contents

## INTRODUCTION

Two main features distinguish the French payment system. The first is its homogeneous legal framework, provided especially by the Banking Law of 24th January 1984, which gives credit institutions the exclusive right to issue and administer payment media. The second is the major role played by cheques within a highly diversified range of cashless payment media.

The administration of payment media has become an industry in its own right, notably in terms of the scale of the investments being made to modernise the exchange and settlement systems. The administration of more than 9 billion cashless payments a year calls for wholesale processing and represents about 35% of the banks' activities and overhead expenses.

This activity is in the throes of far-reaching change: it grew by 10% annually during the most recent years, five times more than the GDP. Over the past ten years, considerable efforts have been made to reduce the cost of bank intermediation. Prominent among these have been measures to promote the automation of payment media, which now accounts for 52% of cashless payments, and the rationalisation of interbank exchange circuits.

Investment in modernisation of exchange circuits over the past decade has lowered processing costs in constant franc terms. Today, automation-related productivity gains have, for the most part, been achieved in respect of all payment instruments except cheques; 94% of the latter continue to be exchanged physically. So the last main project to be undertaken in order to progress the modernisation of the French payment system is the dematerialisation of cheques in interbank exchanges.

Finally, in keeping with the recommendations of the report of the Committee on Interbank Netting Schemes on minimum standards for payment systems, the Banque de France has embarked on consultations with the banking industry to implement a risk-prevention programme for interbank settlements.

## 1. INSTITUTIONAL ASPECTS

### 1.1 General legal aspects

Banking activities and the conditions in which they are carried out in France are governed by the Banking Law of 24th January 1984.

Only credit institutions may conduct banking operations, including the issue and administration of payment instruments as a regular element of their business.

A handful of institutions not included within the scope of the Banking Law (namely the Treasury, the Post Office, the "Caisse des Dépôts et Consignations" (deposit and consignment office) and the Banque de France) may also conduct banking operations and consequently provide payment services.

The Law of 16th July 1992 completed and amended the 1984 Banking Act, introducing the provisions of the second directive on banking and the principle of mutual recognition into French law. Henceforward, credit and finance institutions established in any European community member state are free to set up branches or offer banking services in France.

From now on, these branches will be supervised by the authorities of the country where the head office is located.

### *1.1.1 Representative bodies*

Credit institutions are collectively represented vis-à-vis the public authorities through a two-tier system:

- firstly, institutions which are not members of banking networks (see Section 1.2.1 (b)) subject to special legal status must belong to a professional association acting in the general interest such as the "Association Française des Banques" (French Bankers' Association) for banks, or the "Association Française des Sociétés Financières" (French Association of Finance Companies) for certain finance companies, for example. In the case of banking networks, this task is performed by their central body;
- secondly, the central bodies of banking networks and professional associations mentioned above are affiliated to the "Association Française des Etablissements de Crédit" (AFEC - French Association of Credit Institutions), which represents all credit institutions, provides information to its members and the public, studies all issues of common interest and prepares relevant recommendations with a view, where appropriate, to promoting cooperation between networks. It may also devise and administer services of common interest.

### *1.1.2 The "Conseil National du Crédit" (CNC - National Credit Council)*

The CNC is chaired by the Minister of the Economy, Finance and Budget, while its vice-chairman is the Governor of the Banque de France. The CNC performs a consultative role and serves as a forum for discussion of broad monetary and credit policy. It also studies the conditions in which the banking and financial system operates.

This body serves as a forum for very broad consultation between the representatives of all parties involved in the economic and financial life of the country. As regards payment instruments, it has studied the new electronic payment instruments, focusing in particular on the legal and international aspects of payment cards.[1]

### *1.1.3 Regulatory committees*

There are three of these:

- the "Comité de la Règlementation Bancaire" (Banking Regulations Committee) lays down, in particular, general regulations applicable to credit institutions (on credit policy), security standards to be complied with, rates and terms for financial operations, and regulations governing the setting-up of networks;
- the "Comité des établissements de crédit" (Committee of Credit Institutions) is primarily responsible for taking all decisions concerning individual credit institutions, such as granting a licence or giving specific authorisations or exemptions;
- the "Commission Bancaire" (Banking Commission) is responsible for supervising credit institutions. It is chaired by the Governor of the Banque de France and its Secretariat is staffed by Banque de France personnel. The Banking Commission has a mandate to oversee credit institutions' compliance with regulations governing their industry, to examine their operating conditions and ensure the quality of their financial structure, and to enforce compliance with the rules of professional conduct. The Banque de France is

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1 This work has given rise to several reports, including "Aspects européens et internationaux des cartes de paiement" (European and international aspects of payment cards) (March 1988) and "Nouveaux travaux sur les cartes de paiement" (Further studies on payment cards) (October 1990).

responsible for organising and conducting on-the-spot inspections of credit institutions on behalf of the Commission.

## 1.2 Financial intermediaries that provide payment services

### *1.2.1 Credit institutions*

According to the 1984 Banking Law, these are divided into the following broad categories:

*(a) Banks (or "commercial banks")*

These are all-purpose institutions with full authorisation to engage in a very broad range of activities. In particular, they perform all types of banking operations - notably taking all types of deposits and carrying out related operations such as foreign exchange transactions, and marketing securities and financial products.

Among the 238 banks under French majority control,[2] three stand out in terms of their size, namely the "Banque Nationale de Paris" (BNP), "Crédit Lyonnais" and "Société Générale". These three alone operate more than half of the full-time branches of all commercial banks and take more than 50% of the funds collected by them. There have been nineteen state-owned banks since the end of 1987,[3] including two of the three major banks, namely BNP and Crédit Lyonnais.

Foreign banks have a strong presence in France, with 181 institutions under foreign control,[4] i.e. more than 44% of all banks established in France. 46% of these foreign banks (eighty-three institutions) have their home base in other member countries of the European Community.

*(b) A series of structured networks of banks* comprising the mutual banks ("Banques Populaires", "Crédit Agricole", "Crédit Mutuel"), cooperatives, conventional savings banks (as opposed to the "Caisse Nationale d'Epargne" (National Savings Bank), which is run by the Post Office), and the municipal credit banks, which are also authorised to receive all types of deposits but whose banking activities are limited in certain respects by the legislation or regulations governing them.

These network banks do not usually compete with the others in the same network because each of them operates within an exclusive territorial area. At the national level, central bodies covered by the Banking Law of 24th January 1984 are responsible for organising the networks and providing members with administrative, technical and financial assistance. They also have a supervisory role.

*(c) Finance companies*

Except where specifically exempted, these are not allowed to take deposits from the public for less than two years and are further restricted in their activities in accordance with their basic

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2 These are banks established in metropolitan France and Monaco - 231 have their registered office in France and are incorporated under French law, seven have their head office in the Principality of Monaco and operate under the Monegasque Law, nineteen banks are established in the French Overseas Departments and Territories and are not included in the statistics referred to in this study.

3 Under the Privatisation Law of 6th August 1986 nineteen of the thirty-eight banks previously belonging to the public sector were privatised.

4 Seven of these are established in Monaco and incorporated under Monegasque Law.

status. There are 908 such institutions. Their chief business is either lending or securities trading operations.

***(d) Specialised financial institutions*** are entrusted by the state with a permanent public interest mission and, except incidentally, may not engage in banking operations other than those pertaining to that mission.

### *1.2.2 Other institutions*

A certain number of institutions or bodies administer accounts and carry out banking operations although they are not covered by the Banking Law. Among these are the Post Office and "Trésor Public" (Treasury).

#### *(a) Post Office*

The Post Office's financial services play a significant role in the French financial system, with 9.4 million sight accounts (most of them held on the books of the "Centres de Chèques Postaux" - Postal Cheque Centres) and 22.7 million time accounts (managed by the "Caisse Nationale d'Epargne" - National Savings Bank).

#### *(b) Trésor Public (Treasury)*

The Treasury's receiving and paying officers manage bank accounts for customers (886,000 sight accounts) and carry out a certain number of banking operations.

## 1.3 The role of the central bank

In addition to its general supervisory role (see Section 5), the Banque de France was involved in the field of payment instruments by virtue of the legal responsibilities vested in it by the 1973 Law. This role has been strengthened by its new statutes, promulgated on 4th August 1993. The new law states that the Banque de France "shall ensure the smooth operation and the security of payment systems" (Article 4) and shall have the "sole right of issue of banknotes accepted as legal tender within metropolitan France" (Article 5). These missions are recognised by the new statutes as being part of the fundamental missions of the Central Bank.

### *1.3.1 Cash payments*

The Banque de France alone is empowered to issue banknotes which are accepted as legal tender in metropolitan France,[5] and it circulates coin on behalf of the Treasury.

The Banque de France itself designs and prints banknotes, replaces worn or damaged notes and detects forgeries. Through its 211 branches, it circulates banknotes and coin, and ensures that the needs of the public are met in both quantitative and qualitative terms.

The central bank is currently modernising the manufacture of the different banknotes in order to improve their quality and prevent forgery, and the series of notes in circulation is expected to be renewed entirely in the coming years.

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5 Its geographical competence is confined to the territory of metropolitan France. While the notes distributed by it also circulate in French Overseas Departments, they are issued to the public in these territories by the institutions that hold the privilege of issuing currency in the Overseas Department.

### *1.3.2 Administration of accounts*

The Banque de France administers the account of the Treasury and accordingly has responsibility for Treasury payments and for the collection of receivables.

One or more current accounts are opened in its books in the names of credit institutions. In particular, these receive entries relating to the interbank funds transfer systems, for which the Banque de France is in all cases the settlement agent and in most cases also the clearing agent.

It may also open accounts in the name of brokerage firms or other bodies, its statutes allowing it broad discretion in this area.

The Banque de France manages about 80,000 accounts which are held by the Treasury, credit institutions, enterprises belonging to the public sector (Electricité de France, SNCF, etc.) and private customers of which the majority are employees of the Banque de France, and some private enterprises. The opening of new accounts for private customers and private enterprises is now limited by the new statutes but the Banque de France may continue to manage existing accounts of its private clientele.

### *1.3.3 Administration of interbank exchange systems*

The Banque de France is in charge of the management of all 102 provincial clearing houses, the "ordinateurs de compensation" (computer clearing centres), the "Système Interbancaire de Télécompensation" (interbank teleclearing system) accounting system, the "Centres régionaux d'échange d'images-chèques" (regional cheque record exchange centres) and SAGITTAIRE (see Section 3.1.2). The computer clearing centres system, managed by the Bank of France for twenty-four years, is at the present time being closed and replaced by the SIT.

## 1.4 The role of other private and public sector bodies

Apart from CNC (see Section 1.1.2), several bodies have been established to study problems arising from the evolution of the payment system, primarily from a technical point of view and from that of standardisation. The Banque de France plays an active role in these bodies.

The main bodies concerned are:

- the "Comité Français d'Organisation et de Normalisation Bancaires" (CFONB - French Committee for the Organisation and Standardisation of Banking Practice), chaired by the Banque de France. This Committee works through a large number of working groups, studying issues of common interest relating to the simplification of banking operations, and to the rationalisation and codification of methods and documents used by banks;
- several "Groupements d'Intérêt Economique" (GIE - Economic Interest Groups), notably the S.W.I.F.T. users' group in France, the GSIT (Interbank Teleclearing System Group) (see Section 3.1.2 (d)) and the "Groupement des Cartes Bancaires" (Bank Card Consortium) which exists to study, standardise and promote the National System for Payments by Cards and combat fraud (see Section 2.2.6).

## 2. SUMMARY INFORMATION ON PAYMENT MEDIA USED BY NON-BANKS

### 2.1 Cash payments

The amount of currency in circulation in the metropolitan territory (France and Monaco) at the end of 1992 was Fr.fr. 255.5 billion, of which banknotes accounted for Fr.fr. 237.3 billion and coin for Fr.fr. 18.2 billion. Both these components are legal tender, but the acceptance of coin is compulsory only within certain limits.

There were five denominations of banknotes (20, 50, 100, 200 and 500 francs) and nine types of coin (5, 10, 20 and 50 centimes, 1, 2, 5, 10, 20 and 100 francs[6]) in fiduciary circulation at the end of 1992.

The percentage of cash in circulation in the $M_1$ monetary aggregate has tended to stabilise at around 15% (15.7% in 1991 and 15.5% in 1992), while its share in $M_3$ continues to decline very slowly (6.20% in 1987 and 4.70% in 1992), and is now moving towards an equilibrium level.

The annual number of cash transactions is not known precisely. According to the latest estimates in 1988, there were approximately 22 billion transactions worth more than Fr.fr. 10 at shops and for services alone (excluding motorway tolls and administrative payments). So cash payments clearly prevail in terms of number (more than 75% of all payments), while in value terms their share represented slightly over 2% in 1988.

The importance of this type of payment varies depending on the nature of the trade. As a rough guide, 38% of cash transactions take place in the retail food trade, 7% in supermarkets and 13% in hotels and restaurants.

Customers use two principal means of cash withdrawals:

- by using a card in one of the 17,400 Automated Teller Machines or cash dispensers. 660 million withdrawals were recorded in 1992, representing a total value of Fr.fr. 298 billion. 541 million of these (i.e. Fr.fr. 234 billion) were carried out using interbank cards i.e. cards bearing the "Groupement des Cartes Bancaires" (Bank Card Consortium) logo (see Section 2.2.6). All the automatic cash dispensers installed outside banks can be accessed by the 21 million cards issued by this Consortium's members. For reasons of security, a standard withdrawal ceiling of Fr.fr. 2,000 per seven-day period has been set, but the card-issuing institution may raise this ceiling; moreover, since 1st July 1990, ATMs and cash dispensers have been operating on-line. Other cards, issued by banks to give access to specific services provided by them, allow holders to withdraw cash from their own ATMs and cash dispensers; an estimated 115 million withdrawals were made via these cards;
- by writing cheques (approximately 264 million in 1992 for an average amount of approximately Fr.fr. 1,679[7]).

The current volume of cash in circulation is not expected to vary substantially in the foreseeable future. Two main trends are forecast: on the one hand, the density of the network of ATMs and cash dispensers installed is likely to bolster the use of banknotes; on the other hand, the foreseeable development of token or prepaid cards is likely to curtail the use of cash for small local payments notably for parking, tollbooth or automatic telephone-type machines.

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6 Silver 100 franc coins are used very little for payments.

7 These figures also include cash withdrawals from conventional bank branches by means of bank cards (or "emergency withdrawals").

## 2.2 Non-cash payments

Customers of banks and quasi-banking institutions enjoy access to a broad range of instruments. The cheque predominates despite increasing recourse to automated payment instruments to the detriment of traditional "paper-based" forms.

The body of statistics used as a basis for the comments on cashless payment instruments covers both operations carried out through the official exchange circuits[8] and those that are not carried out in that way,[9] regardless of whether they are issued by banks or quasi-banking institutions (e.g. postal cheques). Data on the latter have been obtained by means of a sample survey, so the figures should be treated as approximate.

Most of the payment instruments described below are considered to be "universally accepted", i.e. the paying institution is bound to accept them when presented to it in the exchange system. Certain particular features may nevertheless exist, depending on the nature of the receiving account (for example, certain savings accounts may not accept direct debits). There are, moreover, certain "non-universally accepted" operations, which are accepted only by prior agreement between receiving and presenting banks. For the time being, this chiefly concerns exchanges of truncated cheques and bank card payments.

### *2.2.1 Cheques*

The cheque is the most widely used cashless payment instrument in France: approximately 4.8 billion cheques were written in 1992,[10] i.e. 50.8% of all cashless payment instruments.

Nevertheless, the rate of growth of payments by cheque has slowed down since 1982, and even declined in absolute value terms in 1987 for the first time in the history of this payment instrument. This slowdown is attributable primarily to the very rapid growth in the use of cards for face-to-face payments and, to a lesser extent, to the use of automated payment media (direct debits and interbank payment orders) for remote payments.

However, bank customers still exhibit a clear preference for cheques. The traditional success of this instrument is mainly due to its simplicity of use, the fact that no charge is made, and the fact that it lends itself to all types of use. For example, it can be used by companies and government agencies as well as by individuals. Although it is not possible to distinguish the amount issued by each of the categories with precision, an estimated 1 billion cheques were written by the first two categories combined and 3.8 billion by the last in 1992.

Individual bank account holders write approximately 120 cheques per year. It is estimated that 52% of cheques written in France are for amounts less than Fr.fr. 300.

Face-to-face payments and remote payments account for 3.3 and 1.5 billion operations respectively, according to available estimates.

Efforts by the banking industry have significantly lowered the cost of cheques:

- processing and forwarding procedures have been modernised by the introduction of magnetic character reading technology (standard CMC7) and the use of reader-sorter machines;

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8 The Paris Clearing House, the provincial clearing houses, the regional cheque exchange centres, the Banque de France, the computer clearing centre and the Interbank Teleclearing System.

9 Instruments exchanged directly between networks or within the same group, as well as within a single institution.

10 The total number of cheques issued also includes the 227 million cash withdrawals from bank branches, most of which are made by means of cheques made out to the account holder.

- the major networks have adopted the principle of non-circulation of cheque forms in their internal organisation: only the cheque details are now circulated in computerised form. This "truncated cheque" circulation procedure is still marginal in interbank exchanges: although the SIT (Interbank Teleclearing System) technically permits the continuous exchange of truncated cheques via the SNEIC ("Système National d'Echange d'Images-Chèques" - National Cheque Record Exchange System), the project has been blocked by the banking industry since November 1989 for the following economic and financial reasons:

- paperless collection will generally reduce execution and settlement times; this will affect institutions differently depending on whether they are presenters or drawees;

- the terms applied to customers, particularly major customers,will tend to come into line with interbank settlement lags;

- the administrative organisation of interbank exchange circuits has been simplified.

When processed via an official interbank exchange, the cheque may be:

- presented physically through a clearing house (94%); interbank settlement lags for presentation on D day are set at:

  D + 1 when the cheque is presented through a clearing house to which the drawee branch belongs (joint procedure instituted in October 1980);

  D + 3 when the cheque is not presented through the territorially competent clearing house (optional "outside-area" exchange procedure introduced in February 1984);

- paperless (6%); the data record containing particulars needed to enter the cheque is exchanged through the CREIC ("Centres Régionaux d'Echanges d'Images Chèques" - Regional Cheque Record Exchange Centres); the interbank settlement lag, generally D + 1, is set by agreement among the centre's members.

Cheques may be presented either directly by the receiving bank, the drawee institution or via a collecting agent (third-party bank or Banque de France) which then seeks collection through the clearing system. Cheques are generally free of charge for both drawer and receiver, which means that their administration by credit institutions represents a substantial expense. However, attempts by banks to bill for the use of cheques have generally come to nothing, notably due to the hostility of consumers' associations demanding something in return, and particularly the payment of interest on sight deposits, which is prohibited by a regulation.

The sharp rise in the number of dishonoured cheques, notably resulting from the growth of cashless payments in recent decades, has induced the Government and Parliament to intervene on several occasions. The "Fichier Central des Chèques" (FCC - Central Cheque Register), administered by the Banque de France, forms the heart of the prevention system, centralising all information relating to payment incidents and to bank or court-ordered prohibitions. It is systematically consulted by account-holding associations before issuing the first cheque book to a new customer. The 3rd January 1972 Act, later modified by the 3rd January 1975 Act, had introduced a procedure whereby persons writing cheques with insufficient funds were prohibited from holding a cheque book and writing out cheques for one year.

Although the number of dishonoured cheques reported by the banks to the FCC has declined in 1991 (- 0.6%) after several years of continuing growth, it still remains high. The macroeconomic impact of this phenomenon is limited, insofar as the number of cheques that remain definitively unpaid may be estimated at approximately one-thousandth of the total number of cheques exchanged between banks. However, it affects certain categories of economic agents in particular, notably shopkeepers, and the mass of litigation entailed seriously overloads the courts and auxiliary services.

This situation has called for the further intervention by the authorities in order to tighten up existing systems of prevention and sanctions, and to provide greater protection for victims of dishonoured cheques. A bill to adapt and strengthen security with regard to cheques and payment cards was thus drawn up in consultation with the various parties concerned and became Law on 30th December 1991. Essentially, the Law, put in force on 1st June 1992, provides for:

- stronger preventive measures: the Banque de France systematically informs banks of prohibitions placed on their customers by any other bank; this prevents persons who have been prohibited from using cheque books, but who hold several accounts, from continuing to write cheques drawn on a bank other than the one that reported the incident;
- a mechanism to encourage persons who dishonour their cheques to settle up: such persons may be removed from the FCC at any time (and thus regain their entitlement to write cheques), by honouring the cheque in question together with payment of a penalty depending on the initial amount of the cheque. Conversely, the person will remain on the register for ten years unless he or she honours the cheque, whereas under the former law the prohibition on writing cheques automatically expired after one year.

Moreover, the new law has enlarged the role of the "Fichier National des Chèques déclarés volés ou perdus" (FNCV-national register of cheques reported stolen or lost), which came into operation in January 1991. This database was developed within the framework of joint venture between the "Conseil National du Commerce" (national retail trade council) and the Banque de France, under whose authority it operated. It allowed shopkeepers and providers of services to combat cheque fraud by enabling them to verify whether or not the cheques received in payment had been reported stolen or lost to the police (or the "gendarmerie") or to the account-holding institutions.

The Act of 30th December 1991 (mentioned above) stated that the database would also register the references of closed accounts and the account numbers of persons who had been prohibited from using cheque books and gave legal status to the Banque de France database on stolen cheques. The new law states:

- that all account-holding institutions must report the stop payment orders that they receive on lost or stolen cheques, along with account closures;
- the details of all the accounts held by persons subject to bank-imposed or court ordered cheque-writing bans to be entered into the database;
- the database is now called the Fichier National des Chèques Irréguliers - FNCI (National Register of Irregular Cheques) and it can be consulted by anyone wishing to verify cheques they receive.

The chief purpose of this register is to provide shopkeepers, suppliers of goods and services, and even individuals with an effective means, by addressing this register, of reducing their losses related to dishonoured cheques, which is a source of considerable losses to the retail sector. It also strengthens the effectiveness of efforts to combat crime relating to stolen cheques, by supplying information on complaints received to the law enforcement authorities. To ensure that the information compiled is as reliable and comprehensive as possible, the register is continuously updated by the Banque de France, with the data of the FCC, the account-holding institutions and the police and "gendarmerie". The register covers both metropolitan France and the Overseas Departments. About 15 millions requests are expected in 1993 and between 120 and 150 million in 1996.

### *2.2.2 Bills of exchange*

Approximately 160 million bills of exchange are processed by banks each year. The use of this instrument as a settlement medium between companies and its popularity among them are due in particular to the widespread use of suppliers' credit in France.

Bills of exchange are issued either as electronic bills of exchange or as electronic promissory notes, or in the form of a conventional paper bill of exchange or promissory note. The electronic bill of exchange and electronic promissory note systems were designed to rationalise and automate the collection of bills of exchange. Money is exchanged between banks not in paper form but on magnetic media, through a computer clearing centre (see Section 3.1.2 (b)) or the SIT (see Section 3.1.2 (d)). Prior to each payment date, the payer receives a list of bills for which payment is due. He transmits his instructions to the paying agent by returning the list appropriately annotated.

Since 1987, moreover, conventional paper bills of exchange may, if the payer has no objection, be converted to electronic form. The amounts are then collected under the same conditions as the LCRs[11] and BORs[11] once the information has been entered. This reform has boosted the number of bills exchanged on automated media from 35.7% in 1987 to 92.5% in 1992.

The bills of exchange are settled between the banks two working days after their exchange through a clearing house and five working days after their exchange through the computer clearing centre or the SIT.

In general, no charge for these operations (except where the paying bank provides additional services) is levied on the drawee of the bill of exchange or writer of the promissory note. On the other hand, a commission is charged by the collecting bank, which must pay an interbank commission to the paying bank in the case of LCRs and BORs.

### *2.2.3 Credit transfers*

With 1.5 billion operations in 1992, credit transfers rank third behind cheques and cards by number of transactions. They account for 15.6% of exchanges. These statistics cover both bank transfers and postal transfers.[12]

For the most part, this instrument is used for payments made by companies, government agencies and local authorities. Credit transfers are used very little by individuals.

Until recently, only recurrent credit transfers (such as the payment of salaries, for example) were automated, while ad hoc payments (such as those to suppliers) were exchanged on paper-based media. This distinction is tending to disappear as credit transfers are becoming increasingly used as exchanges on magnetic media, and in 1992 more than 95% of all operations were automated.

Ordinary transfers (without value date) are settled on the day of presentation. On the other hand, credit transfers for payment at due date are presented two or three days in advance of interbank settlement.

Ordinary transfers are generally made at no charge. Nevertheless, the sender may have to pay any ancillary charges in case of telegraph or telex transmission. When exchanged through a computer clearing centre or the SIT, an interbank commission is charged on due-date credit transfers. This commission varies according to the due date and is paid by the sending bank to the receiving bank.

Moreover, automation of credit transfers increasingly relies on data links, giving birth to new formulas such as "teletransfers" (initiated by the company or from computer terminals designed for general public use, such as ATMs or videotex), which are expected to expand significantly (see Section 2.2.8).

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11 LCR "Lettre de Change Relevé" and BOR "Billet à Ordre Relevé" are automated bills of exchange.

12 Credit transfers represent a high percentage (70.2%) of total cashless instruments in value terms, but this figure has little significance owing to the very high value of transfers made for cash management purposes.

### *2.2.4 Direct debits*

Introduced in 1967, the direct debit ("avis de prélèvement" in France) still accounts for a relatively small proportion (no more than 8.5%) of all cashless payment instruments (by number of transactions). This instrument is used notably by bodies whose claims are of a recurring nature, such as bills for electricity, gas, telephone, water, etc., and for monthly income tax payments.

Despite the advantages that it presents for the banks (in terms of relatively low processing costs, being fully automated), for originating companies (simplifying their accounting administration and allowing them to collect money on their initiative), as well as for individuals (by simplifying the physical act of payment), this procedure is now tending to stabilise after fairly rapid initial growth.

A series of modifications were introduced in October 1985 in order to stimulate the use of this instrument. Changes included the creation of "accelerated" direct debits with shorter settlement times than ordinary debits, and the adoption by the banking industry of a regularisation procedure to allow payers, on certain conditions, to contest a payment and obtain cancellation of the entry.

Initiators of direct debits must be approved by a bank, which in turn requests a "Numéro National d'Emetteur" (NNE - national sender number) for direct debits from the Banque de France, on its own responsibility.[13] The initiator must as well obtain a signed pre-authorisation from the debtor and has to send it to the debtor bank.

Before transmitting the direct debit order to his bank for collection, the sender must notify the payer of the amount and date of the debit (by sending an invoice, for example), to enable the latter to make sure that there are sufficient funds in his account or contest the order if he so wishes.

Direct debits are settled two or four days after their exchange through the computer clearing centre or the SIT (see Section 3.1.2), depending on whether they are "accelerated" or ordinary debits. Except in the case of direct debits initiated in payment of tax demands, collection of the direct debit gives rise to payment of a commission by the paying bank to the collecting bank. As a general rule, a commission on collection is charged to the creditor entity by the collecting bank.

### *2.2.5 The interbank payment order (TIP)*

The "Titre Interbancaire de Paiement" (TIP - interbank payment order) was introduced in February 1988 to replace the "Titre Universel de Paiement" (universal payment order). It differs from the direct debit in that the payer is required to signal his agreement to each payment, as with a cheque. He does so by signing the TIP form, which is sent by the creditor at the same time as the corresponding invoice. The form is then processed automatically by the thirteen banks currently authorised for the processing of this payment instrument.

The record of the data appearing on the TIP is then presented to a computer clearing centre or to the SIT. The payers' banks receive the records through the same channel, allowing them to debit their customers' accounts without having to verify the payment orders, which are kept by the authorised centres.

This new instrument is practical from the payer's point of view, leaving him full control over the operation; it is simple and efficient for the creditor, allowing him to rationalise and optimise the collection of receivables; and it is productive from the banks' point of view as it lends itself to fully automated processing. As a modern payment instrument, the TIP combines the advantages of the direct debit with those of the cheque, without any of their drawbacks; it is expected gradually to replace certain remote payments made by cheque and could evolve towards a totally paperless procedure with the development of telepayment techniques; 44 million Tips were exchanged in 1992.

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13 An NNE can be granted to a non-resident body provided it holds an account with a credit institution established in France.

### *2.2.6 Card transactions*

#### *(a) Main categories of cards in use*

There are three main categories of cards in use in France:

- bank cards, which are issued by credit institutions acting either individually or through the Bank Card Consortium; the cards are issued to bearers holding an account with these issuing institutions. There were 21.1 million interbank cards, known as "Cartes Bancaires" (CB - bank cards), in circulation at the end of 1992. Approximately 14,1 million of them[14] also allow payment to be made in shops abroad (affiliated to either VISA or Eurocard/MasterCard);
- travel and entertainment cards, issued by bodies which do not, in principle, hold funds on deposit, but which have credit institution status in France within the meaning of the aforementioned Banking Law of 1984, which authorises them ipso facto to issue payment instruments to their customers;
- retailer cards (an estimated 20 million) issued by retailers or suppliers of services in order to secure customer loyalty and, in some cases, grant credit facilities. The credit is repaid by debiting the customer's bank account, to which the card issuer does not have direct access.

However, once such cards are used to obtain credit, or where they can be used at outlets other than the issuer's own shops, the card must be issued by a credit institution, even if the retailer's name generally features prominently on the card.

The following paragraphs focus exclusively on bank cards, which are used for the majority of payment transactions and for a large majority of cash withdrawals from automatic cash dispensers.

#### *(b) National system for payments by card*

In July 1984, the banks belonging to the "Groupement Carte Bleue" together with the "Crédit Agricole" and the "Crédit Mutuel" signed a draft agreement with a view to developing a national system for payments by card, and decided to form the Bank Card Consortium ("Groupement Cartes Bancaires") in order to implement it.

##### *(i) The nature of the cards*

Bank cards are debit cards[15] which generally allow the bearer the benefits of deferred payment, retail transactions being debited to the holder's account in the month following the date of the operation. Cash withdrawals from automatic cash dispensers are debited upon receipt of the corresponding transaction by the account holder's bank.

Since 1988 bank cards have gradually adopted the magnetic stripes and micro-processor technology. This latter technology consists of inserting a micro-processor into the card (known as a chip card), allowing this payment instrument to perform five functions in total security: card authentication, identification of the cardholder by means of a Personal Identification Number, certification of the transaction, quantification of data and control over the flow of transactions. By the end of 1992, all cards contained a micro-processor.

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14 452,000 of the 14.1 million international cards are "prestige" cards.

15 Although French bank cards are debit cards, banks may grant credit facilities to their customers on the accounts to which the bank cards are attached.

*(ii) Retail payments*

1.4 billion bank card payments were made in 1992, representing 15% of all cashless transactions in that year. 21 million cards allow their holders to pay for purchases at almost 520,000 French retail outlets affiliated to the system. The retailers are equipped with electronic terminals (320,000 electronic point-of-sale terminals at the end of 1992), or manual printers (200,000 at the end of 1992) to record the transactions. 90% of payments in 1992 were made via an electronic terminal.

Shopkeepers affiliated to the system enjoy guaranteed payments under certain conditions (in particular they must request prior authorisation from a payment centre in the case of transactions above a certain amount). Since the end of 1992, any transaction carried out in the absence of verification of the confidential code at the point of sale is deemed "subject to execution" even if authorised: in other words, payments are no longer guaranteed.

The nationwide adoption of the confidential code verification procedure - through increasingly widespread use of chip cards - necessitates the modernisation of retailers' equipment: they have to install mixed electronic payment terminals capable of using the chip's functions and reading the contents of magnetic stripes (particularly for foreign cards).

Card payments were collected in accordance with a complex procedure administered by the interbank processing centres. From 1995, they are progressively exchanged through the SIT (see Section 3.1.2 (d)).

With regard to pricing, cardholders pay an annual fee to the issuing institution which varies according to the services attached to the card (cash withdrawals only, national or international payments, immediate or deferred debit). Retailers are charged a commission proportional to the amount of the transaction, this commission being freely negotiated between each bank and its customers.

For each payment made by bank card, the retailer's bank pays to the cardholder's bank a service commission known as a "Commission Interbancaire de Paiement" (interbank payment commission). This commission is designed to cover the expenses borne by the cardholder's bank in processing the operation and contributing to security measures, and to cover the risk incurred in guaranteeing payment.

*(iii) Outlook*

Motivated primarily by a desire to reduce the level of card-related fraud, the Banking Card Consortium has focused on the nationwide introduction of the chip card and on the direct assumption by the banks of certain functions hitherto performed jointly by the banking community, and in particular the authorisation function within the banking Card Consortium.

This policy has been followed by an important reduction in the amount of card-related fraud. In 1992, for the second consecutive year, the amount of fraud has decreased (- 22%) despite an increase of the total amount of card payments (+ 8,7%).

### *2.2.7 Interbank networks accessible to customers*

These are primarily the following:

- services provided by Automated Teller Machines (ATMs): requests for new cheque books, teletransfers between two accounts of the same account holder at the same institution, and consultation of account movements and balances, etc., are generally available only to the particular institution's customers (or to customers of the network or group);
- cash withdrawals by means of card, other than interbank withdrawals:

- telematics services (see Section 2.2.8);
- the use of EDIFACT messages in bank/company relationships.

Despite the increasing number of experiences or projects regarding non-banking EDI (relationships between enterprises, between enterprises and administrations, and even between the Banque de France and enterprises for the statistical documents and statements needed for setting up the balance of payments), the French banks are still cautious on common initiatives to be taken in this field. Generally, the banks consider that the banking supply of EDI services is depending on each bank's own strategy vis-à-vis its customers, and that it must not restrict in any way the other banks, nor need important mutual investments.

The CFONB and many banks participate in the activities of EDIFRANCE, created in 1989 as a common structure for the various EDI groups in France; as soon as 1988, the CFONB even set up a developing group for the development of EDIFACT messages between banks and enterprises which became, under the name of EDIFINANCE, the first officially aknowledged "Sectoral Operational Group".

Furthermore, aware of the need of enterprises' treasurers to have additional information on settlements, the CFONB has just decided to create a standard "EDI Transfer" that could be exchanged in the current systems; it will provide the receiving customers with specific zones for references, which would respect EDIFACT standards. These new operations will be accepted in the SIT in April 1994.

### *2.2.8 Recent developments*

These are principally the following:

#### *(a) Access to public telephone boxes*

58% of public telephone boxes now in place work exclusively with chip cards,[16] issued by France Telecom (either prepaid cards or subscriber cards with deferred payment, with phone calls charged to the subscriber's account) or bank cards;

#### *(b) Prepaid cards*

Alongside the above-mentioned telephone card (which is a single purpose card) together with a number of similar projects (concerning the Paris Metro, airlines, etc.), a wide range of municipal card projects are currently in progress, involving approximately 18% of towns of more than 10,000 inhabitants. These cards will provide access to various municipal services such as parking, school canteens, leisure activities, transport, day-care centres, sports amenities, etc. Some projects of electronic purse are presently under review. Banque de France recently stated publicly that, according to the 1984 Banking Law, the issue of multi-purpose prepaid cards is equivalent to a banking operation, and that the issuer must therefore be approved as a credit institution by the Committee of Credit Institutions (see Section 1.1.3).

#### *(c) Telematics services available to individuals and companies*

The 6.3 million videotex terminals (known as "Minitels") currently in place (at end-1992) give their users access to the home-banking services now provided by most major banks. Several

16 From a technological point of view, these cards are to a large extent specific to public telephone box installations. Ultimately, the aim is to enable bank cards equipped with micro-processors to be used in public telephone boxes, as is already the case with certain call boxes in France.

individuals and professional users were subscribers to "banking and financial" services at the end of 1992. The "general public" services essentially allow subscribers to consult account balances and track recent account movements, to consolidate different accounts, and to consult financial and stock market information. Business services are more extensive and also include treasury management assistance products (including remote loading of account movements onto the treasurer's computer facilities, and initiation of transfers between predetermined accounts of the same company).

Regardless of whether they are intended for individuals or businesses, these services are billed according to the duration of connection time and are also subject to a monthly subscription fee.

However, the combined use of a videotex terminal with a magnetic stripe bank card as a means of initiating a debit (by typing in the card number manually), although accepted by certain bodies (some mail order firms for example), is not satisfactory from the security point of view. Consequently, the banking industry and leading billers have undertaken numerous studies since 1989 in order to ascertain more precisely the demands of the various parties, and to work out technical solutions leading to satisfactorily secure telepayment procedures.

These studies have resulted in:

- the definition of two types of payment: payment of bills, or post-payment (electricity, etc.), and ordering of goods or services, or prepayment (mail order, travel tickets, etc.);
- the recommendation of a hierarchy of levels of security appropriate to each payment context (security is less of a problem where there exists a separate contract between user and supplier), emphasising the use of chip cards and a special reading device to verify the authenticity of the card and the confidential code where a high level of security is required;
- proposals to use existing payment instruments (bank cards, credit transfers, debits) to make these payments.

The various telepayment scenarios have been reviewed by the CFONB (see Section 1.4) and two new instruments are to be launched in 1993:

- the TEP "Titre Electronique de Paiement" (Electronic Payment Order), which follows a direct debit scheme with the payee giving his approval for each payment using telematic means;
- the TVR "TéléVirement Référencé" (Identified Teletransmitted Order), credit transfer through telematic means whose reference number enables the creditor to identify the operation when receiving it.

## 3. INTERBANK EXCHANGE AND SETTLEMENT CIRCUITS

### 3.1 General overview

#### *3.1.1 Internal circuits in institutions or groups of institutions*

There are two main categories of exchanges within the general funds transfer system: those that pass through the official circuits governed by interbank agreements or conventions, and those that are channelled through so-called "unofficial" circuits governed by bilateral inter-institutional agreements.

Most banking organisations have their own remote data links. In the case of groups or networks, these generally consist of two levels, one local, the other nationwide. These arrangements generally handle truncated cheques drawn on the institution's, group's or network's branches under a

procedure which abolishes the internal circulation of cheque forms and which has been adopted by most major banks. Together with the automated instruments, internal to the institution, the group or the network, accounting information is also provided.

It is estimated that 20% of cashless payments are not routed via the official circuits described below: viz. 39% of the total number of credit transfers exchanged, 9% of bills of exchange, 23% of direct debits and 20% of cheques. A fair proportion of these involve two accounts (payer and payee) on the books of a single institution: expressed in terms of the number of instruments sent, the share of such items is an estimated 17% of cheques, 21% of direct debits and 35% of credit transfers. Electronic exchanges between institutions belonging to the same group or network (intra-group exchanges) involve a smaller proportion of payments (approximately 1.7% of all electronic credit transfers initiated and fewer than 3% of direct debits).

### *3.1.2 Interbank circuits and networks*

The present organisation of the French payment system may be classified as follows:

- Retail payments

  Clearing houses, computer clearing centres, regional cheque record exchange centres, SIT-interbank teleclearing system and the Bank Card Consortium processing centres.

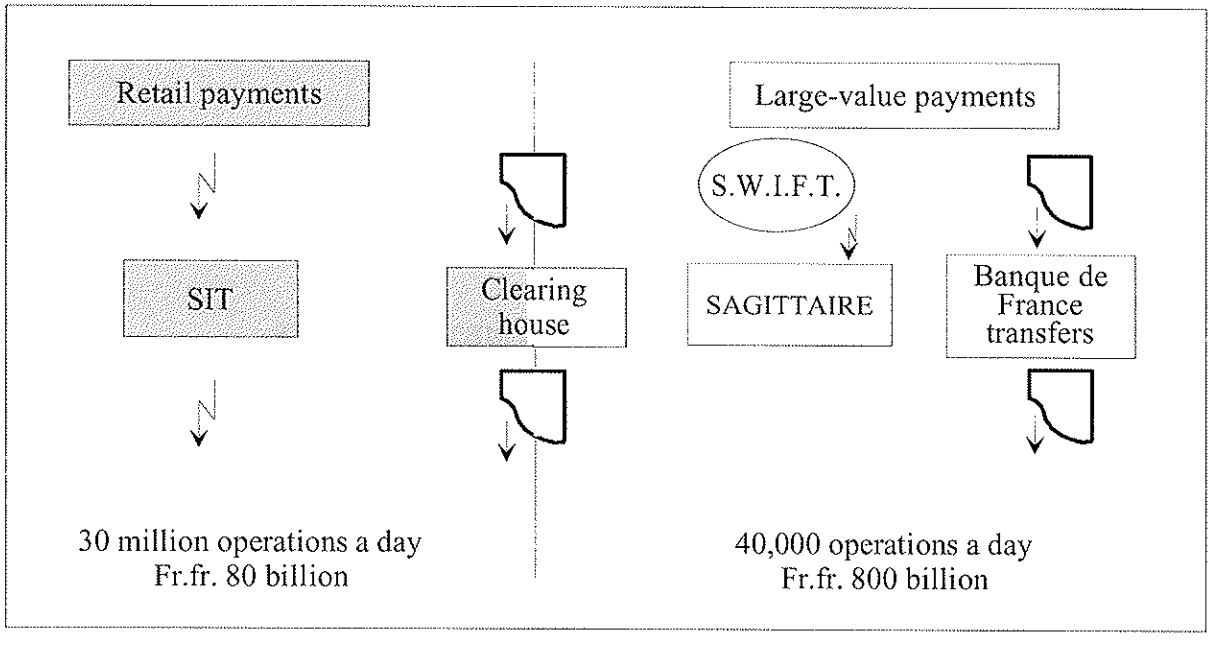
- Large-value payments

  Paris Clearing House, SAGITTAIRE, Banque de France credit transfers.

  These account for the bulk of the instruments that banks exchange among themselves.

Chart 1

**Interbank circuits in France**



### *(a) The clearing houses*

Following a series of reforms designed to simplify administrative procedures, official exchanges of paper-based instruments (mainly cheques, credit transfers and bills of exchange) are conducted through one of the 104 clearing houses:

- the Paris Clearing House ("chambre de compensation des Banquiers de Paris") for Paris and its surrounding area, placed under the authority of an interbank consortium. In addition to the exchange of payment items presented by customers, this clearing house is used for the settlement of cash operations of sometimes very high value (see Section 3.2.1);
- 102 provincial clearing houses under the authority of the Banque de France and operating on its premises; these are located in the capitals of the "départements" and in ten other major localities;
- the Principality of Monaco, under the authority of the "Banque Centrale Monégasque de Crédit".

Overall, 3.7 billion items were presented in 1992, representing a total value of Fr.fr. 55,192 billion (including 3.6 billion cheques for a total of Fr.fr. 11,582 billion).

All institutions, on which cheques are drawn or at which bills of exchange are payable, are bound by regulations to participate in the clearing houses, through an agent in certain cases. In practice, this means all banks, the Treasury, the Post Office and the Banque de France.

Clearing house sessions are held every working day, with one daily session between 11 a.m. and noon for the provincial houses, and two sessions (at 10 a.m. and 4 p.m.) for the Paris Clearing House.

Certain exchanges (credit transfers) are subject to same-day settlement, while others (cheques and bills of exchange) are settled only after an agreed period of time. For each clearing house, members' net balances, calculated at the end of the session, are entered daily into the accounts administered locally by the Banque de France.

Amounts arising from credit balances become final only at the end of the Banque de France accounting day, when all debtor members have assembled the funds needed to clear their debit position. Failing this, the clearing operations may be cancelled by application of a revocability clause governing the exchanges. The clearing is then repeated, this time without the defaulting member.

Under regulatory or contractual provisions, payment instruments must be presented to a specified clearing house, depending on their place of payment. For cheques, however, which represent 97.3% of all instruments exchanged, a specific procedure called the "outside-area cheque exchange agreement" has been in place since 1984: the presenting bank may exchange the outside-area cheques at the clearing house of its choice, irrespective of the place of payment. This procedure allows cheques to be presented for collection as close as possible to their place of encashment. It leaves the drawee institution the choice of the optimum method of routing cheques to the paying branch, notably by eliminating the circulation of cheque forms inside its institution. The settlement time has been set at three working days from the date of presentation (compared with one day for inside-area cheques) in order to offset this transfer of administrative work to the drawee bank.

Banks that have signed the outside-area cheque exchange agreement but are not represented at any of the 104 clearing houses may ask the Banque de France to receive the cheques on their behalf and to forward them. This function is performed by the "Joint Collection Service", which simply acts as an intermediary between the presenting bank and the drawee bank; it does not guarantee finality of the payment. The leading credit institutions are members of the outside-area cheque exchange agreement. In 1992, 811 million cheques, or 22% of all cheques cleared, were handled under this procedure.

*(b) "Ordinateur de compensation" (computer clearing centres)*

The network of computer clearing centres, which is designed to cover the entire country, began operations in Paris in 1969. It was decentralised (between 1976 and 1985) to eight other centres: Lyon, Strasbourg, Rennes, Nantes, Lille, Marseille, Bordeaux and Toulouse. The computer clearing centres are administered by the Banque de France.

With the exception of truncated cheques, all categories of instruments subject to automated interbank exchange (credit transfers, direct debits, interbank payment orders, electronic bills of exchange, withdrawals from cash dispensers, and bank card transactions) are accepted. Credit transfers and direct debits account for 76% of all items exchanged.

In 1992, the centres handled more than 1.8 billion items (credit transfers, direct debits, cash dispenser withdrawals, electronic bills of exchange, interbank payment orders and card payments) totalling Fr.fr. 7,661 billion, or 24% in number and 12% in value, respectively, of all official interbank exchanges.

To allow for continuous exchanges via direct data links between banks and in order to reduce transmission times for operations, the industry decided to set up the SIT.

It has been planned that the computer clearing centres would continue to operate for a transitional period until the SIT becomes fully operational during 1993. The banking industry considers that there is only room in France for a single nationwide interbank exchange system. At mid-1993, only the Paris centre was still operating, while the province computer centres had all been progressively closed.

*(c) The "Centres Régionaux d'Echanges d'Images-Chèques" (CREIC - regional cheque record exchange centres)*

These centres are located in nine major cities,[17] of which eight had a computer clearing centre. The CREICs are administered by the Banque de France and allow their members to exchange cheque data on magnetic media without physically transferring the forms, which are kept by the presenting institution.

Apart from the Banque de France and the Post Office, only institutions with a regional or local organisation currently belong to these centres. Between them, they transmitted more than 231 million forms in 1992, representing 6% of all cheques exchanged.

*(d) "Système Interbancaire de Télécompensation" (SIT - interbank teleclearing system)*

At the proposal of the Banque de France, it was agreed in 1983, within the framework of the Working Party on Payment Media, to establish a new national system for the exchange of high-volume payment instruments based exclusively on telecommunication links.

The goals were:

- to reduce transmission and processing times for interbank payments in order to guarantee performance dates;
- to permit dematerialisation of "continuous" exchanges;
- to reduce the cost of interbank exchanges.

The work of implementing the system is being carried out by an interbank group called GSIT (Economic Interest Grouping for the Interbank Teleclearing System), formed in June 1983. The

17 Rennes, Strasbourg, Metz, Nantes, Lille, Bordeaux, Toulouse, Marseille and Lyon.

Banque de France is a member of the GSIT and an ex officio member of its decision-making and research bodies.

The SIT represents a major step forward in the French payment system. It involves the entire banking community and is designed to permit the exchange of all high-volume payment instruments. The SIT is a network of decentralised and bilateral exchanges directly linking the different credit institutions' data-processing centres. It transfers data via the TRANSPAC public packet-switching network. The exchange of payment media between originating and receiving credit institutions automatically triggers the forwarding of accounting messages, which are transmitted to the accounting centre administered by the Banque de France.

The SIT began operations on 29th May 1990 with a pilot network, on which institutions exchanged relatively small volumes of transactions. Deployment of the SIT began in February 1991 and the switch from the Ordinateur de Compensation to the Système Interbancaire de Télécompensation (SIT) began in 1992. This changeover is being made in a programme of phased computer clearing centre closures. All automated low value payments will be handled by the SIT, except for card payments, and truncated cheques. which will be handled later.

*(i) Participation in the SIT*

Rules concerning participation in the SIT are as follows:

- all banking institutions presenting or receiving payments eligible to the SIT must participate in the SIT, as a direct or an indirect participant:
  - direct participants: their number has been set at twenty-five in view of the system's technical and organisational capabilities. To qualify as a direct participant, an institution or group of institutions must have a volume of payments representing at least 0.20% of volumes exchanged annually via the SIT, and must be able to show a level of solvency recognised as commensurate with the degree of risk that its failure would entail for the other direct participants. The responsibilities of direct participants are both financial and technical and extend to the institutions they represent;
  - indirect participants: these present and receive payments via a direct participant;
- as an exception the institutions exchanging annually less than 5,000 automated payments eligible to the SIT can ask for one of the following statuses:
  - ENASIT (non-SIT member institutions): they receive their operations, as the participants, under their own bank code; on the other hand, with the exception of the rejected receipts, they present their payments as a client, using the bank code of another institution participating in the SIT;
- SIT unknown: they present and receive their payments if any as a client, under the bank code of an other institution participating in the SIT.

*(ii) Operating rules*

Each participant has one or more processing centres whose terminals serve as access points to the network and are exclusively dedicated to the SIT. These terminals are connected to all of the joint centres (administration, accounting and back-up). Each terminal comprises two logical units, the SI (Sending Installation) and RI (Receiving Installation), which communicate with those of the SIT and the other participants.

The SIT joint centres perform precise functions. The administration centre monitors the network, controls the flow of operations, and maintains the overall coherence and security of the software. The accounting centre manages accounts relating to exchanges. It is administered by the

Banque de France. The back-up centre is the final standby for receiving institutions. The network is designed to support approximately 250 terminals.

*(iii) The organisation of an accounting day*

The SIT operates twenty-two hours a day from Monday to Saturday. SIT working days start at 8 a.m. and end at 6 a.m. the following day. During the working day, all network members are obliged to receive the interbank operations addressed to them. Closing time for same-day settlement is 1.30 p.m.

SIT accounts are closed at the end of each accounting day, and net balances for debiting and crediting to the accounts of system participants are transmitted to the Banque de France at that time.

*(iv) Protecting the SIT against systemic risk*

As part of the risk-reduction programme embarked upon by the Banque de France (see Section 5.3), discussions are now in progress regarding possible arrangements to protect the SIT from interbank exchange-related risks.

Settlement will not be effected on a multilateral net basis (one settlement of each participant's position vis-à-vis the system), but on a bilateral net basis (settlements of each participant's positions vis-à-vis each other participant) through TBF transfers (as soon as TBF becomes operational), consequently within the framework of an interbank settlement system protected against systemic risks (see Section 3.3).

Moreover, during the course of the day, one or more intermediate accounting balances are drawn up in order to settle payments already exchanged. This practice makes possible a measure of certainty of settlement early in the day, and permits potential difficulties encountered by a direct participant in settling its SIT entries to be foreseen (and consequently prevented).

As conventional protective measures such as prior guarantees (posting of cash or securities as collateral) and loss-sharing agreements have been rejected, the following possible solutions are currently being considered to complement this mechanism:

- limitation of risk exclusively to direct participants: direct participants undertake to settle, at a due date, the payments sent or received by them on behalf of their indirect participants;
- each direct participant undertakes to settle bilateral accounts within clearly defined limits:
  - vis-à-vis each of the other direct participants, each sets ceilings below which settlement occurs automatically;
  - each retains the right to suspend these credit lines, but only for a limited period, at the end of which either the two institutions concerned renegotiate automatic settlement ceilings, or the SIT governing body decides to withdraw one of the two institutions from the system.

## 3.2 Structure, operation and administration of major large-value systems

There are three circuits for wholesale payment transfers in France: the Paris Clearing House, SAGITTAIRE and Banque de France Credit Transpac System. Large-value operations handled by these systems will be taken over by the new Banque de France Transfer (TBF) System once it becomes operational (see Section 3.3).

### *3.2.1 The Paris Clearing House*

The Paris Clearing House handles the exchange, on the one hand, of payment items presented on behalf of customers (concurrently with the other 103 clearing houses) and, on the other hand, of large-value payments stemming either from interbank market operations or from transactions in connection with international transfers. These payments are presented in the form either of "avals de trésorerie" (cash transfer authorisations)[18] or of "virements de trésorerie" (cash transfers), the latter medium alone being used for international payments.

At the end of each session, members' net balances are recorded in the institutions' accounts administered by the Banque de France. Credits are not final before 6.30 p.m. on the same working day, when all the debtor members have covered their debit positions. Failing this, the netting is repeated without the defaulting member, whose debit entries are then deleted by the Banque de France. There has never been any occasion to invoke this revocability clause to date.

### *3.2.2 Sagittaire*

"Système Automatique de Gestion Intégrée par Télétransmission de Transactions avec Imputation de Règlement Etranger" (automated system for the integrated handling and settlement of foreign transactions by means of telecommunication).

SAGITTAIRE has handled the settlement of payments relating to international transfers in French francs since 1984 and is currently the only automated system in France for the transfer of wholesale payments. It is designed to extend the logic of S.W.I.F.T. for international payments to the national level in order to permit the processing and automation of all phases in the execution of international transfers.

SAGITTAIRE is administered by the Banque de France, which also participates directly in the exchanges in its capacity as a receiving member. Relations between SAGITTAIRE and each member are governed by bilateral conventions with the administrator.

3,316,475 messages representing a total amount of Fr.fr. 59,219 billion were processed in 1992. SAGITTAIRE is open to credit institutions operating in France that are members of the S.W.I.F.T. network. Foreign banks may only join through their subsidiaries or branches in France. Currently, sixty-three banks are members of SAGITTAIRE, and five of them account for 52% of payments sent and 54% of payments received.

S.W.I.F.T. is the message transmission network. The SAGITTAIRE system receives transfer orders from members in S.W.I.F.T. format. The orders are recorded in shadow-accounts on receipt, and credit notifications are addressed to the recipients, also in S.W.I.F.T. format. Messages are final, in the sense that the sender may not cancel a transfer once initiated. The only way to correct a transfer initiated by mistake is for the recipient to send a payment in the reverse direction.

SAGITTAIRE's exchange day, i.e. the period during which orders are recorded, begins at 8 a.m. and ends at 5.30 p.m. Orders sent after 5.30 p.m. are stored by S.W.I.F.T. and processed at the start of the next exchange day. SAGITTAIRE's accounting day starts at 1 p.m. on D-1 and ends at 1 p.m. on D, which means that transfers sent after 1 p.m. on D, regardless of whether they are processed during the same exchange day or at the start of the following exchange day, are only entered in the accounts on D+1. The net positions of members are drawn up after the close of the accounting day, then debited or credited on the books of the Banque de France. However, transactions do not become final until cut-off time and all the debit positions are covered.

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18 Cash transfer authorisations (avals de trésorerie) may be regarded in the first place as an acknowledgement of debt presented on the borrower's initiative to the clearing system, sufficient to debit the lender's account and, at loan maturity, as the lender's netting receipt sufficient to debit the borrower's account. They are due to be transformed into electronic credit transfers by 1993 in order to permit routing via the Banque de France Transfer system.

Exchanges conducted through SAGITTAIRE can be revoked by the Banque de France: if at the end of the day a bank is not sufficiently in funds to clear its debts, the central bank may cancel certain transfers. In the event of transfers being cancelled, this is done automatically in reverse chronological order, and the initiating and receiving members are notified immediately. However, there has never been any occasion to revoke a transfer since SAGITTAIRE has been in operation.

SAGITTAIRE is backed up by a data-processing centre external to the Banque de France. In the event of an incident in the main centre, it takes a maximum of four hours for the standby system to cut in, so that it may be necessary temporarily to exchange "virements de trésorerie" through the Paris Clearing House.

The fees charged to users of the system are calculated to include depreciation of the investment and operating costs, together with message transmission charges borne by the Banque de France.

#### *3.2.3 Banque de France credit transfer system*

The Banque de France credit transfer system is mainly used by banks after the closure of the clearing houses for late operations or to adjust their balances at the central bank.

The system permits transfers of funds between current accounts in Paris or in the Banque de France branches.

The payments are posted on an operation by operation basis and the Banque de France can reject a payment order at the end of the day in case of overdraft in the account of the issuer.

### 3.3 Main projects and policies being implemented

The organisation of the French payment system is currently under review with the implantation of a risk-reduction programme and the creation of the TBF system. The future organisation can be described as follows:

#### *3.3.1 Legislative, regulatory and political measures*

Under its risk-prevention programme (see Section 5.3), the Banque de France is currently implementing a gross settlement system called TBF ("Transferts Banque de France" - Banque de France Transfers), which is being prepared in 1994. This system will specialise in large-value payments, with the benefit of "on-line" administration of current accounts on the central bank's books; subject to intraday debit ceilings backed by guarantees, it will settle immediately the amounts debited/credited between banks' accounts.

#### *3.3.2 Participants*

All credit institutions holding a current account in the books of the Banque de France will be entitled to participate in the TBF system. The TBF service will comprise two functions: its main function will be to record transactions in accounts opened with the Banque de France and to monitor account positions on the books of the Banque de France; the other, subsidiary, function will be to permit direct access to the Banque de France Customers' Server, which allows credit institutions (notably small and medium-sized ones) to monitor their cash positions with the Banque de France in real time.

### *3.3.3 Types of transactions*

The TBF system will handle all types of credit transfers, regardless of their nature (cash and customer operations) and their amount. It will not accept any other type of transaction. Its primary purpose will be to permit the exchange of wholesale payments (approximately 30,000 movements a day representing about Fr.fr. 800 billion).

### *3.3.4 Operation of the system*

The TBF system is a real-time gross settlement system which will be fully automated and will utilise telecommunication links. The service will be open for extended working hours. Each transaction will give rise to a check on the funds available in the issuer's current account (credit balance or, failing that, debit balance up to the authorised intraday debit ceiling) and will be placed in a pending queue if these limits are exceeded. The computer will conduct a continuous sweep throughout the accounting day in order to process the maximum number of payments. Orders may not be executed in their order of arrival. Furthermore, and in order to facilitate the flow of exchanges and avoid any excessive build-up of intraday overdraft requirements, the Banque de France will perform optimisation routines at agreed set times in order to maximise the number of payments entered in the accounts at any given time (for example, at the start of the day for payments notified the previous day). These optimisation routines will be performed on all payments in an institution's queue, regardless of whether its accounts are administered by the Banque de France in Paris and/or in the provinces.

### *3.3.5 The technical environment*

No specific network will be required in order to send messages through the TBF, and it has been decided to use S.W.I.F.T. as the message carrier. But, because of the need for dual information circuit whenever a payment order is to be issued, the S.W.I.F.T. network will handle a special circuit, known as "T circuit". It will operate as follows:

- the payment message will be transmitted to the beneficiary bank;
- a copy of the payment message will be routed to the Banque de France;
- the message and the copy will be equally secured by "authenticators" calculated on the basis of bilateral keys.

In view of the international context, with increasing interdependence between payment systems, messages will be conducted in conformity with international interbank standard (ISO).

### *3.3.6 Settlement procedures*

Any current account opened in the name of a credit institution at the Banque de France in Paris or the provinces will be eligible to record TBF orders as well as other types of entry (debits or credits prepared by the Banque de France, cash withdrawals, etc.). The Banque de France will assess continuously, and on a consolidated basis, the position of accounts opened in its books in an institution's name before proceeding to debit or credit an operation.

To allow for the concern expressed by credit institutions as regards operational constraints, several types of message will be available, depending on whether operations are to be executed on arrival within the available ceiling (guaranteed or non-guaranteed, see Section 3.3.8) or from a time set by prior agreement between the banks. A money market agreement is planned, which will lay down rules of conduct between institutions in order to regulate financial flows on a satisfactory basis.

The accounting day will close as follows:

- up until the first accounting closure, called "CUT-OFF 1", messages will be executed on the basis of currently available balances (credits, or debit ceilings), except where notified to the contrary by the sender and the recipient (in which case the message will be deleted);
- prior to CUT-OFF 1, an optimisation routine will be carried out, after which debit ceilings (both guaranteed and non-guaranteed) will be deleted; no further increase in debit balances will be permitted;
- during the adjustment period, i.e. between CUT-OFF 1 and CUT-OFF 2 (which will signal the end of the accounting day), only those messages intended to clear debit balances or execute payments in the queue at CUT-OFF 1 will be accepted.

Finally, at CUT-OFF 2, messages that have not been recorded in the accounts will be deleted by the Banque de France. These cancellations will give rise to penalties, without prejudice to damages between participants, for which the institution initially responsible for the default will be held liable. In the exceptional event of the Banque de France maintaining a debit balance at the second CUT-OFF, overnight overdrafts will be subject to punitive interest and may result in a downward revision of the non-guaranteed debit ceiling of the defaulting institution on the following accounting day.

### *3.3.7 Pricing*

The principles on which services offered by the Banque de France through the TBF system are to be priced are still under review.

### *3.3.8 Management of credit and liquidity risks*

Prior to executing any transaction, the Banque de France will systematically verify the availability of funds. This entails ensuring that the payment comes within the limits of the guaranteed or non-guaranteed debit ceilings.

However, because the immediate introduction of the new limitation represented by the ceiling mechanism may result in certain payments being left pending, the Banque de France has opted to introduce the system gradually.

As soon as the accounts have been debited and credited (from which time the funds transfer will be final), the funds will be made available to the receiving institution.

*(i) The intraday ceiling mechanism*

The Banque de France will provide intraday debit facilities, which may be partially uncollateralised.

This debit ceiling may be increased by the provision of guarantees such as securities pledged as collateral, standby letters of credit, or a risk mutualisation arrangement. With the exception of securities pledged as collateral, these types of guarantees will be included in the calculation of prudential ratios, according to procedures and principles of allocation currently being worked on.

There will be no maximum limit on additional facilities backed by securities pledged as collateral, but the Banque de France reserves the right to limit the level of overdrafts backed by the other forms of guarantee, or to cancel them, at its discretion and in the light of the institution's situation.

A fee for using the non-guaranteed portion of the intraday debit ceiling is currently being considered according to procedures which have yet to be defined in consultation with the banking industry.

Moreover, the guaranteed portion of the debit ceiling (on which it is not intended to charge an intraday fee at any time in the future) will always take precedence over the non-guaranteed portion.

### *3.3.9 Implementation*

Implementation of the TBF system began in February 1992 and will proceed in four stages:

*(i) Stage 1 real-time accounting (February 1992)*

The first phase of the risk reduction programme was completed last year in February. It consists of a new data processing system making it possible to manage current accounts in real time. The first element of the TBF system, the accounts server, is presently operational.

This significant change means that interbank settlements can now be declared final on the same day whereas in the previous system transactions were only declared final on the following morning. Thanks to an access in real time to their accounts at the central bank the banks are informed of operations already settled.

However, given the fact among others that a number of credit transfers are still being made on paper, real-time management is still not being used to its fullest extent. Therefore, no strict cap can be put on debit positions in the course of the day. Nevertheless a substantial reduction of risk has already been obtained by a reduction of settlement lag.

*(ii) Stage 2 dematerialisation (by the first half of 1995)*

The two servers (accounts server and telecommunication server) will be fully operational. During this stage a complete dematerialisation of large-value payments will be realised and operations which are presently exchanged and netted in SAGITTAIRE will be transferred to the new system.

*(iii) Stage 3 cap reduction (date to be announced)*

Intermediate phase in which all payments are to be credited and debited in real time, subject to a progressive lowering of intraday debit ceilings to the level deemed desirable by the Banque de France in the target system. It will allow observation of the operation of the queuing system and to assess the effectiveness of the optimisation routines. Irrevocability will occur at CUT-OFF 2 at the latest.

*(iv) Stage 4 target (date to be announced)*

Completion of implementation of the risk-reduction programme, creating an environment of irrevocability for all payments to be settled on the central bank's books. The payments will become final during the day as soon as they are settled.

The future organisation of the French payment system may thus be classified as follows:

- Retail payments:

  Clearing houses, SIT-interbank teleclearing system and the regional cheque record exchange centres;

- Large-value payments:

  TBF (Banque de France Transfers).

## 4. SPECIAL USE OF INTERBANK TRANSFER SYSTEMS FOR INTERNATIONAL AND DOMESTIC FINANCIAL TRANSACTIONS

### 4.1 Exchange and settlement systems for international transactions

The French payment system is characterised by a high degree of international activity, the payment exchanges generated being concentrated on a small number of participants. The S.W.I.F.T. network now has a paramount role in this respect. It handles not only the bulk of international transactions, but also French franc payments connected with international operations (see Section 3.2.2). Finally, as regards retail payments, there is a system for the exchange of French franc and foreign currency cheques issued abroad, and several collection circuits for bank card operations.

#### *4.1.1 An internationally open, yet concentrated system*

Almost half of the banks established in France are active internationally, since there are at present 218 users of S.W.I.F.T.; 40% of them are foreign-controlled institutions. As indicated by S.W.I.F.T. statistics, the French banks' international activity is in fact greater than that of foreign banks in France; this explains why France holds 9.35% of S.W.I.F.T.'s capital, whereas traffic originating from France represents only 7.5% of the network's total traffic.

Based on balance-of-payments figures, it is estimated that approximately ten banks generate 80% of correspondent banking revenues in France, the top four alone accounting for 65%. S.W.I.F.T. traffic statistics also illustrate this degree of concentration, since ten or so banks account for two-thirds of the traffic (sent and received), the top four alone accounting for 43%.

#### *4.1.2 Retail payments*

Internationally, low-value face-to-face payments nowadays are made chiefly in cash, by cheque or by bank card. The majority of remote payments are made by cheque. The developing technique of file transfer is expected to bring substantial improvements to the latter kind of payments.

##### *(a) Cash exchanges*

There has been a considerable increase in concentration of manual exchanges of foreign banknotes between banks in recent years, both through the merger of the largest operators and through sub-contracting to these same wholesalers some of the major banks' small-scale activity. Currently, more than three-quarters of such exchanges are handled by a single institution, the remaining one-quarter being shared among fewer than ten institutions.

### *(b) Exchange of card-backed payments by foreign cardholders in France and by French cardholders abroad*

Each card-issuing network has its own circuit for the collection of payments representing transactions abroad.

For VISA and Eurocard/MasterCard transactions abroad by holders of cards issued by French networks belonging to the Bank Card Consortium (see Section 2.2.6), or in France by holders of cards issued abroad, the circuits are identical. A single organisation specific to each issuing network acts as the international interface. For VISA this operates through the "Centre National Carte Bleue", and for Eurocard/Master-Card through the "Centre Eurocard". These Centres perform a preliminary clearing within the framework of bilateral collection exchanges between the countries concerned, notably VISANET for the VISA network and ENESS for the Eurocard/MasterCard network.

The proceeds of uniform eurocheques are collected similarly. eurocheques written in France by foreigners, and those written abroad by national customers, are exchanged via national exchange centres. After processing, they are transmitted to the addressee banks via the usual national circuits.

### *(c) Exchanges of cheques written abroad*

Following a decision of 1st June 1988, holders of French franc accounts are free to use their cheque books for payments abroad in either French francs or foreign currencies.

In view of the very small number of items, no specific circuit has been set up to exchange French franc cheques written abroad. The cheques are routed via the clearing houses, where the receiving foreign bank's correspondent bank presents them to the payer bank.

There are, however, specific procedures for the exchange of foreign currency cheques written abroad.

An organisation for the exchange of foreign currency denominated cheques drawn on French franc accounts has been in operation in Paris since June 1988. Membership consists of the thirteen largest institutions or networks. The exchange agreement relates to cheques denominated in currencies listed on the official Paris market and received by French banks in their capacity as correspondents of foreign receiving banks.

Physically, the cheques are presented to the payer institution via the Paris clearing house. Payment is made outside the cheque exchange circuit, between the payer bank and its foreign correspondent by the fourth day following the exchange at the latest. This correspondent in turn then pays the addressee's bank. In 1992, approximately 376,000 cheques totalling approximately Fr.fr. 15 billion were exchanged through the organisation. Most of the cheques exchanged were for trade payments between companies, which accounts for their high average amount (Fr.fr. 40,000).

With regard to foreign currency cheques drawn on foreign currency accounts, a recommendation issued by the CFONB (French Committee for the Banking Practice Organisation and Standardisation) of 17th May 1988 invites banks to present these cheques to the payer banks by mail, stipulating payment by S.W.I.F.T. message, or by telex nine working days at the latest after the date on which the cheque was sent.

*(d) File transfers*

In line with the above, French banks are playing an active part in new S.W.I.F.T. developments: five of them are involved in the pilot S.W.I.F.T.-EDI experiment, and others, motivated by a desire to reduce costs by processing their high-volume international operations more efficiently, have played a particularly active role in the definition of two new S.W.I.F.T. services - "Interbank File Transfer" (IFT) and "Bulk Payments". These two, when combined, will permit the exchange of this type of payment in the form of standardised file transfers. Pending the introduction of these new facilities, certain French banks - in particular the "Caisse Centrale des Banques Populaires", as part of the "Confédération Internationale du Crédit Populaire" - have established procedures with their principal correspondents for the exchange of high-volume payments on magnetic media (credit transfers, direct debits, etc.).

### *4.1.3 Wholesale payments*

SAGITTAIRE (see Section 3.2.2) is the only automated system that handles French franc payments in connection with international transfers. Customer payments represent roughly one-quarter of the total number of payments (approximately 3,400 out of a daily total of around 13,300), but account for only 3.5% of their total value (approximately Fr.fr. 13 billion a day out of a total of around Fr.fr. 237 billion a day). The average unit value of a customer payment via SAGITTAIRE is therefore approximately Fr.fr. 4 million (compared with an average of Fr.fr. 22 million for interbank payments handled by SAGITTAIRE). The proportion of low-value customer payments is tending to decline following a reform in 1989 of the rules governing the reporting of transactions for balance-of-payments purposes, whereby, certain low-value "international" payments in French francs (credit transfers, electronic bills of exchange, etc.) were allowed to be handled via computer clearing centres and SIT.

### *4.1.4 ECU payments*

*(a) ECU-denominated accounts*

The Banque de France has held ECU-denominated accounts on its books since 1989. Foreign deposits and withdrawals are made through a French ECU-clearing bank that holds an account in the name of the Banque de France.

*(b) Système Intégré de Règlement-livraison en Écus (SIRE-Integrated ECU Payment System)*

The Banque de France has set up a delivery vs. payment system for ECU-denominated securities in response to the Treasury's wish to issue bills in ECUs and to enhance the safety of ECU transactions on the Paris market.

The SIRE system has made it possible to give same-day value for payments in ECU securities transactions handled by two delivery-versus-payment systems operating in Paris. These systems are SATURNE, which currently handles fixed rate Treasury notes (BTANS) denominated in ECUs, and RELIT, which handles long-dated bonds (OATs) denominated in ECUs for the time being.

The main features of the SIRE systems are:

- it uses the TBF system. The credit transfers across ECU-denominated accounts held with the Banque de France are posted in real time, after checking that the sender's balance can cover the payment being made. This makes immediate finality of payment possible;

- the exchanges made through the delivery-versus-payment systems are also final and irrevocable. The Banque of France informs both delivery-versus-payment systems of each participant's "purchasing power" before chaining starts;
- the link to ECU clearing is made though a clearing bank. This makes it possible for SIRE participants to obtain same-day value for their ECU funds when they reinvest them through the clearing. They can also receive funds through the same circuit, but finality of payment only occurs after the BIS clearing is over at about 4 p.m.

#### *(c) ECU clearing safety*

The Banque de France has offered a liquidity facility for ECU clearing participants since September 1991. This facility makes it possible for a clearing participant in a short position at the end of the clearing to use the balance of its ECU-denominated account as collateral for an overnight ECU loan from another clearing participant.

The Banque de France is also planning a securities-backed facility that could take one of two forms:

- an arrangement in which the Banque de France is merely the depository institution for the securities pledged by the short clearing participant to the long participant making the ECU loan;
- an arrangement under which the Banque de France is an intermediary between the lender and the borrower, the latter having put up securities as collateral for the Banque de France through the SATURNE or the RELIT systems, see Section 4.2.2. This type of system would require the opening of an ECU-denominated account in the name of the Banque de France on the books of the BIS. The general meeting of the EBA agreed to an amendment to this end in its clearing rules.

### 4.2 Exchange and settlement systems for securities transactions

#### *4.2.1 Institutional framework*

The French capital markets have expanded considerably since 1983. This evolution has been encouraged by the authorities. In particular, new instruments (negotiable debt instruments, futures, traded options) and new markets (MATIF,[19] MONEP,[20] etc.) have been created, while new exchange systems (RELIT and SATURNE) have been introduced.

There is now a broad range of instruments in use:

- equities, fungible Treasury bonds (OAT) and other bonds whose initial life is more than seven years are traded on organised (official) markets;
- negotiable debt securities, with maturities ranging between ten days and seven years, issued by the Treasury (Treasury bills), credit institutions (certificates of deposit and certificates issued by specialised institutions and finance companies) and companies (commercial paper), are traded on over-the-counter markets that form the (non-exclusive) interbank element of the money market. The SATURNE system provides the financial community with modern conditions for processing transactions in negotiable debt instruments;

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19 "Marché à terme international de France".

20 "Marché des options négociables de Paris".

- futures and traded options, each on their specific market: MATIF for financial futures, and MONEP for traded options on securities;
- other instruments traded on the financial market, including interest rate swaps, future rate agreements, caps, floors, collars, etc.

### *4.2.2 Exchange and settlement systems*

#### *(a) RELIT ("Règlement-Livraison de Titres" - securities settlement and delivery system)*

The RELIT system became operational at the end of 1991. It has replaced all of the different settlement circuits hitherto in place on the French market. The new system matches trades automatically and makes daily entries in securities and cash accounts, based on the principle of delivery versus payment.

The system guarantees simultaneous cash settlement and delivery of securities within a maximum of three working days after the date of the trade or redemption ("liquidation") for securities transacted on an organised market. It is then up to SICOVAM ("Société Interprofessionnelle pour la Compensation des Valeurs Mobilières"), the only central depository body since the general dematerialisation of securities and implementation of a book-entry system, to proceed with the chaining of transactions at the due settlement date. During this process, securities are delivered insofar as they are available on the vendor's securities account, and insofar as the buyer has lodged a sufficient guarantee with the Banque de France, which is responsible for the cash leg of the transaction. The transactions thus processed are irrevocably recorded in the securities account (with SICOVAM) and the cash account (with the Banque de France). In the event of an insufficiency of securities or cash, the transactions are suspended and reprocessed in subsequent days' chainings.

The guarantee provided to its members by the "Société de Bourse Françaises - SBF" (French Stock Exchange Association) which manages the Stock Exchange underlies this arrangement. The SBF guarantees its members settlement in cash or delivery of securities in case of counterparty default. Membership of this guarantee mechanism, currently reserved for brokerage firms, will shortly be extended to other market participants.

#### *(b) SATURNE*

In September 1988, the Banque de France put in place a settlement system for operations in Treasury bills called SATURNE ("Système Automatisé de Traitement Unifié des Règlements de créances Négociables" - system for the standardised processing of settlements of negotiable claims), designed to improve the security and speed of settling transactions in these bills. SATURNE was subsequently expanded to include operations in other categories of negotiable debt instruments, i.e. certificates issued by specialised financial institutions and financial companies, certificates of deposit and commercial paper (subject, for the last two categories, to a minimum underlying pool of Fr.fr. 100 million and an initial life of six and three months respectively). During the course of 1992, the SATURNE system has been unconditionally opened to all French franc negotiable short-term debt instruments and to foreign currency denominated securities.

In 1992, SATURNE sharply increased its activity: 126,904 transactions relating to Treasury bills (+ 15.5%) were settled, for a total amount of Fr.fr. 10,200 billion (+ 96%). These figures do not include repurchase agreements involving Treasury bills (Bons du Trésor) within the framework of repurchase tenders and negotiated repurchase agreements with the Banque de France.

There are approximately 350 participants in the system: credit institutions, brokerage firms, insurance companies and pension funds, foreign central banks and international financial institutions, together with CEDEL and Euroclear. Each negotiable debt instrument current account is divided into several sub-accounts, in order to distinguish between the account holder's own securities

and those held for its different categories of customer (mutual funds, insurance companies, non-residents, etc.).

*(i) Transactions processed*

The system records operations conducted within the settlement procedure (e.g. securities against cash, including repurchase agreements, and securities transfers without cash payments).

It also serves to process a broad variety of loans of securities in response to the needs and wishes of contracting parties, e.g. unsecured loans; loans collateralised by cash or securities; securities-backed loans, akin to swaps of securities of different types and/or maturities; and loans against cash. SATURNE's operations are confined for the time being to institutions' over-the-counter operations (either directly among themselves or via specialised market-making bodies as intermediaries).

In the case of repurchase agreements with delivery of securities and securities loans, SATURNE processes and arranges them through to repayment at maturity. Where required, securities and cash movements are generated automatically by the system, as are cash movements corresponding to interest payments.

Finally, since 15th September 1990, SATURNE has been used to settle deliveries of repurchase agreements involving Treasury bills within the framework of repurchase tenders and negotiated repurchase agreements with the Banque de France (see Section 5.4.2).

With the integration of negotiable medium-term bills denominated in francs and ECUs, the SATURNE system was extended to handle all negotiable debt instruments. The system now handles foreign currency denominated transactions involving these securities, but it only processes the securities transfers and therefore does not provide payment vs. delivery.

*(ii) Operating principles*

The system is based on the principle of dual notification. Regardless of the type of transaction, each contracting party must transmit a notification to SATURNE, after which SATURNE matches the two notifications before recording the transaction definitively. After each matching, the transaction is settled in one of the three daily chainings (and one "catch-up" chaining at the end of the afternoon), when the counterparties' accounts are verified for sufficient funds or securities. Cash movements arising from SATURNE are recorded at same-day value in the accounts held in the books of the Banque de France. If the vendor is found to be in default of delivery after the final chaining of the day, a penalty is applied, which is automatically debited from the latter's cash account and credited in full to the buyer's account. The existence of several daily chainings, and the possibility provided by SATURNE of settling operations with same-day value, gives a temporarily defaulting participant a chance to obtain the missing securities on the market. Thus only a tiny proportion of all transactions actually give rise to penalties.

*(iii) Irrevocability*

Under the risk-reduction programme (see Section 5.3) movements of securities in SATURNE will be irrevocable. In particular, cash settlements to be credited to and debited from members' current accounts will be given priority over all other settlements. If a member is unable to settle his transactions, he will be prohibited from buying in subsequent chainings until his account has been settled.

*(c) MONEP and MATIF*

Transactions on the MATIF and MONEP are cleared multilaterally via a clearing house, MATIF SA and SCMC ("Société de Compensation des Marchés Conditionnels" - Options Markets Clearing Company) respectively, which are substituted as counterparty to each transaction, thus ensuring irrevocability at the close of the day's session. To avoid incurring risks, the two clearing houses make daily margin calls in respect of the transactions recorded by them.

More than 55 million transactions were exchanged in 1992 on the MATIF (+ 48% per year). At the end of 1992, MATIF ranked fourth among the seven main financial futures markets.

The development of the MONEP has continued in terms of total value of operations in 1992 (+ 15.6%), while for the first time since the creation of this market, the number of transactions declined slightly (- 5.5%).

## 5. THE ROLE OF THE CENTRAL BANK IN INTERBANK SETTLEMENT SYSTEMS

### 5.1 General responsibilities

The Banque de France plays a major role in the field of payment media and interbank settlement systems:

- by virtue of its new statutes, pursuant to the Law of 4th August 1993, it is vested with the task of overseeing the payment systems (see Section 1.3);
- through the decisive influence that it wields through its market operations and through its central position in the payment system in its dual capacity as administrator (of joint services on behalf of the financial community) and as operator (through the scale of the operations it performs on behalf of the Treasury and institutional clients);
- by virtue of the special interest it takes in the intrinsic soundness of the payment system and in efforts to combat fraud;
- lastly, under the Banking Law of 24th January 1984, only credit institutions subject to regulation and supervision (in which the central bank plays a paramount role) are entitled to offer payment services to customers.

The Banque de France has consistently promoted measures to modernise the French payment system. Consequently, it has played an active role in reforms, carried out in consultation with the banking industry, designed to lower the cost of bank intermediation by automating payment media and rationalising payment circuits.

#### *5.1.1 Rule-making*

The entire body of regulations applicable to the banking system contributes to the security of settlement systems, for example by defining balance-sheet ratios designed to guarantee the solvency of institutions, and by overseeing interbank risks. The task of framing these regulations is performed by the "Comité de la Réglementation Bancaire" (see Section 1.1.3).

There are few regulations regarding interbank payment and settlement systems. The existing rules are contractual in nature and are laid down by a number of interbank consultative and standardisation bodies such as the CFONB (see Section 1.4), the "Groupement des Cartes Bancaires" (see Section 2.2.6), the SAGITTAIRE Executive Committee (see Section 3.2.2) and GSIT (see

paragraph 3.1.2 (d)). The Banque de France is represented in these bodies (it chairs the CFONB), where its role as the central bank and banker of the Treasury gives particular weight to its views.

In addition, since the late 1970s the Banque de France has played a very active role in the field of payment and settlement systems.

Firstly, in 1978, the Interministerial Committee on Information Technology invited the Banque de France to undertake studies and implement programmes to promote the automation of financial transactions in the banking and financial sectors, in liaison with Government authorities.

Secondly, in January 1979, the Government asked the Banque de France to form and run a working party to study the rational and coherent development of payment instruments. Its terms of reference included laying down general rules to be observed by banks for exchanges of paperless money, and setting up an interbank data transmission system to promote automated exchanges and provide banks with equal access to electronic resources.

The membership of this Working Party on Payment Media consists of representatives of the main parties concerned and is chaired by the Governor of the Banque de France.

Thirdly, in April 1983, the Ministry of the Economy, Finance and the Budget gave a fresh stimulus to discussions on this subject and gave the Banque de France an operational mandate:

- to devise practical, technical and financial procedures for setting up a data transmission network;
- to make precise recommendations to permit rapid growth in the flow of automated payments and hence optimum utilisation of this network.

Since its formation, the Plenary Group on Payment Instruments has conducted a large number of studies resulting in an interbank consensus in a number of major decisions, including the setting-up of the SIT.

This working party continues to play a strategic role in policy-making with regard to payment and settlement systems, in the observation of trends and in setting medium and long-term goals, and coordinates the work with trade and industry bodies.

Finally, by virtue of the general terms of reference laid down by its statutes, the Banque de France, like most central banks in the developed countries, is seeking to strengthen the intrinsic soundness of financial systems through greater control over the risks to which they are exposed. After a detailed study on the prevention of risk arising in payment systems and in the processing of wholesale transfers, it announced in April 1990 its intention to implement a programme to guarantee successful execution of interbank settlements in order to lower the level of credit risk significantly (see Section 5.3).

### *5.1.2 Audit and control*

There is no specific procedure whereby the central bank oversees compliance with rules directly or indirectly concerning interbank exchange and settlement systems, over and above the general supervision undertaken by the Banking Commission and the general task of oversight of the payment system vested in the central bank by its statutes (see Section 1.1.3).

On the other hand, the Banque de France regularly performs audit procedures for the interbank exchange and settlement systems which it administers. It pays particularly close attention to maintaining continuity of service.

## 5.2 Provision of settlement facilities

### *5.2.1 Use of current accounts*

Credit institutions do not have accounts especially earmarked for interbank settlements. The Banque de France administers accounts in the name of each institution, whose close-of-day balance is taken into account when determining compulsory reserves. All direct transactions between the banks are recorded in these accounts, together with the settlement of balances arising from netting systems (and, in future, gross settlements relating to TBF (see Section 3.3)).

Indeed, the Banque de France, which also is the only institution to hold accounts in its books in the names of all banking and financial institutions, is the point through which all payments between institutions or to/from the Treasury must pass, regardless of whether the operations are for their own account or are settlements on behalf of customers.

### *5.2.2 The role of the Banque de France in gross settlement systems*

#### *(a) Local credit transfers between accounts*

To make transfers within a single locality, the main account holders can use special forms called "Banque de France credit transfers", used mainly for settlements initiated by banks and stockbrokers on their own account. In Paris, where the number of transfers is particularly large and involves substantial sums, these credit transfers are not handled by the Paris clearing house, but are transmitted directly by the recipient to the Banque de France, which makes the necessary transfers of funds between the initiator's and recipient's accounts.

In the provinces, where "Banque de France credit transfers" are fewer and the amounts involved smaller, these payments may also be transmitted and settled through the clearing system.

The "Banque de France credit transfers" are entered in the recipient institution's account on receipt, but they remain revocable and may be returned to the sender's account, if the sender has insufficient funds to enable it to settle at the close of accounting day. The funds are thus not made available to the recipient institution definitively until the close of the accounting day.

"Banque de France credit transfers" are the principal medium for interbank transfers and are scheduled to disappear with the introduction of the TBF system (see Section 3).

#### *(b) Urgent out-of-town credit transfers*

The Banque de France provides an urgent out-of-town credit transfer service for its account holders, allowing the recipient institution's account to be credited on the books of any of its branches or sub-offices via the use of telecommunication links. This service is used primarily by credit institutions for large-value cash transfers, either within a given network, or between different institutions, and for urgent credit transfers requested by business customers. Funds must be available prior to the transfer, which is final upon execution. This service is also scheduled to disappear with the introduction of the TBF system.

### *5.2.3 Relations with net settlement systems*

The Banque de France acts as settlement agent for the net settlement exchange systems.

In order to exercise greater control over the risks incurred by it in this respect, the Banque de France has redefined its role in the interbank exchange and settlement process, giving priority attention to those segments of the process that are particularly sensitive in terms of central bank risk.

The data transmission function does not fall specifically within the ambit of the central bank. In the SIT, which is replacing the system of computer clearing centres, this function is performed by an interbank consortium.

The "clearing agent" function needs to be carried out within a minimum regulatory framework. It may therefore be performed either by the central bank, giving it control over the process leading to the recording of settlements on its books, or by an outside supplier subject to rules laid down by the central bank, and over which the latter has a right of oversight.

The "settlement agent" function falls within the exclusive preserve of the central bank, the body charged with the general task of overseeing the payment system and the banking system.

### *5.2.4 Its role in the settlement of securities transactions*

SATURNE

Within the framework of its responsibility for the administration of Treasury bills held on current accounts, vested in it by an Ordinance of 1945, the Banque de France introduced a system of delivery against payment for these securities in 1988; in 1989 and 1990 the system was extended to other negotiable claims (bills issued by specialised financial institutions and finance companies, certificates of deposit and commercial paper). The central bank administers the system and acts as settlement agent (see Section 4.2.2 (b)).

RELIT

The RELIT system commenced operations on 16th November 1990 and is intended to replace all of the delivery and settlement channels currently in operation on the French stock exchange market. Because delivery of securities by the RELIT system is final, the Banque de France, acting as settlement agent, will make cash settlement irrevocable by virtue of pledge of collateral into an escrow account. Moreover, it will provide specific assistance to the French Stock Exchange Association, the inter-brokerage firms' clearing house (see Section 4.2.2 (a)).

### *5.2.5 Credit facilities*

At present, because current accounts are under normal circumstances not monitored during the day, credit institutions are able to enjoy implicit intraday overdrafts, arising from payments made. Moreover, on an exceptional basis, and for the accounts of credit institutions only, the central bank allows non-guaranteed overdrafts at the close of the accounting day, but these carry heavy penalties in the form of an interest rate.

However, since the end of 1992, credit institutions enjoy the possibility to deposit securities as a pledge in case of an exceptional debit position at the end of the day. According to that scheme, for the purpose of computation of interests paid on collateralised debit positions at the end of the day, as well as for the monitoring of reserve requirements, account is taken of the consolidated balance of all the accounts included in the "perimeter of consolidation" of a given institution.

In the future TBF system (stage 4), with the systematic monitoring of current accounts during the day, to avoid impairing the flow of payments, intraday overdrafts will continue to be accepted by the Banque de France, but they will be limited by predefined binding ceilings. These ceilings will have to be backed by guarantees in whole or parts, depending on the central bank's preassessment of the individual risk of the credit institution. The non-guaranteed portion of the overdraft, if any, may be interest-bearing.

### *5.2.6 Pricing policy*

#### *(a) General remarks*

The new statutes (see Sections 1.3 and 5.1) state explicitly that all services offered to the Treasury or third parties "shall be remunerated in order to cover the expenses incurred by the Banque de France". The Banque de France will therefore in due course define the conditions and tariffs applicable to the Treasury, the account of which and all related transactions have been managed free of charge up to now (with the exception of those operations given to the Banque de France by the Treasury[21] for the account of its own clients, which were already charged for in the past). In contrast, interbank fees charged by banks were always forwarded to the Treasury (except for those operations emitted for the collection of taxes which are free of interbank commissions).

Those operations undertaken for the account of credit institutions, enterprises belonging to the public sector and private enterprises have always been charged for to square their cost.

#### *(b) Principles for the charges in interbank systems*

It has to be stated that in France the banking community has agreed on interbank fees (see above) for several payment instruments. In addition, charges for the participation in the different exchange systems may apply.

*(i) Exchanges (see also Section 3.1.2)*

*SIT*

The Banque de France does not itself operate the SIT, but serves as settlement agent to the system. This service is free of charge. But the participants (and thus also the Banque de France as a participant) are charged per operation.

*SAGITTAIRE*

Fees charged by the Banque de France to the participants of SAGITTAIRE were originally defined so as to cover the operating and investment costs. Given that the latter have been reimbursed now, only the operating costs are charged to participants as follows:

- the operating costs (except for teletransmission) through an annual fee calculated on the basis of the number of S.W.I.F.T. messages sent and received by each participant;
- teletransmission costs are recovered from participants seperately on the basis of the real cost of the messages sent by SAGITTAIRE to each of the participants and charged to the Banque de France by S.W.I.F.T.

21 The Treasury itself manages about 800,000 accounts for private customers and in this context calls on the services of the Banque de France for cashless operations related to this activity.

*CHAMBRES DE COMPENSATION*

The services offered to banks in the 103 Chambres de Compensation operated by the Banque de France are free of charge (see Section 3.1.2 (a)). The Chambre de Compensation des Banquiers de Paris, which is not managed by the Banque de France (see Section 3.2.1), charges members the cost incurred by its operations.

*TBF*

Once TBF is operational, the Banque de France will charge the participants so as to recover the operational and investment costs it has incurred (investment cost only insofar as client communication and account information are concerned; see also Section 3.3.7).

*(ii) Account management and collection items for credit institutions*

The account management and cash operations are free of charge. Other services are charged for their cost value.

According to interbank regulations issued by the Conseil National de Crédit banks are obliged to participate either directly or indirectly in the Chambres de Compensation. The Banque de France only represents some credit institutions (as indirect participants) in the exchanges.

### *5.2.7 The risk reduction programme*

Until now, the only arrangement that allows the central bank to safeguard itself against risks arising in connection with its role as settlement agent is the principle of payment revocability, which exists in all the interbank systems. The development of continuous payment systems, the growing speed of execution and the increasing interconnection of payment systems all make application of this principle difficult, if not impossible. What is more, the existence of the principle of revocability may even add to systemic risk by creating an illusion of security and giving credence to the idea that Banque de France intervention is guaranteed in the event of default. This situation is aggravated by the fact that, in the absence of "on-line" accounting, institutions pay no attention to the level of their central bank money during the course of the day.

In line with its general terms of reference, the Banque de France intends to strengthen the intrinsic soundness of the financial systems by controlling more effectively the risks to which the systems are exposed. Consequently, it has embarked on a risk prevention programme designed to guarantee the execution of interbank settlements in order to bring about a significant lowering of the level of risk. This programme, which entails a specialisation of exchange systems, hinges on four points.

**Monitoring and limiting debit positions during the day:** the "on-line" administration of current accounts held in its books in the names of credit institutions will enable the Banque de France to monitor funds available continuously. The general principle of finality of operations which is due to replace the current concept of revocability will make such surveillance necessary. Initially at least, the Banque de France will continue to accept the existence of debit positions during the day, but these will have to remain within ceilings (see Section 3.3.8);

**The introduction of a large-value gross-settlement system** (TBF), which will operate in real-time and carry the payments currently made primarily via Banque de France credit transfers and "avals de trésorerie" (cash transfer authorisations). They are no longer well suited to modern conditions owing to the size of the payments, their degree of urgency and their security requirements;

**Risk-reduction measures within net payment systems:** all payment systems which involve netting need to have guarantee mechanisms of their own with the twofold purpose of setting

up an "observatory" for exchange systems. This facility would centralise during the day the current positions of participants in the exchange systems (clearing system, current account balances, status of the TBF pending queues). The "observatory" would perform monitoring function, enabling the Banque de France to detect critical situations and to improve its overview of the payement system.

## 5.3 Monetary policy and payment systems

### *5.3.1 Reserve requirements*

French-based credit institutions must meet mandatory reserve requirements, which were significantly reduced in 1992. As these are calculated as an average of end-of-day balance during a monthly period, the total amount of credit institutions' balances on Banque de France accounts at the end of any given day may be used during the following day to make payments.

### *5.3.2 Provision of liquidity*

#### *(a) Mechanisms*

The Banque de France intervenes on the interbank market in three ways:

- by entering into repurchase agreements on its initiative on a tender basis ("appels d'offres"), usually at a rate representing the lower end of the fluctuation margin for the day-to-day market rate;
- by entering into five to ten-day repurchase agreements on the banks' initiative ("pensions de 5 à 10 jours"), usually at a rate representing the upper end of the fluctuation margin for the day-to-day market rate;
- by entering into operating at customary market rates and conditions (reverse repurchase agreements of variable maturity, buying and selling negotiable debt instruments).

The categories of paper utilised for repurchase agreements are Treasury bills, private commercial bills and commercial paper: the Banque de France reserves the right also to enter into repurchase agreements against other categories of paper. In the case of repurchase agreements against Treasury bills, the instrument is delivered via the SATURNE delivery and settlement system.

#### *(b) Preventing technical risks*

A temporary breakdown in a settlement system may deprive institutions of part of their expected funds and impair their ability to forecast their cash position. This situation may give rise to an artificially created liquidity shortfall. Such situations have occurred in France on the occasion of lengthy breakdowns in the SAGITTAIRE system, particularly when these coincided with the end of a period designated for averaging mandatory reserves.

Improvements in standby procedures designed to shorten interruptions to these systems should help to avoid this type of situation. In particular, the future TBF system will incorporate all necessary measures to prevent risk of interruption to the operation of the settlement system.

Credit institutions, meanwhile, need to strengthen their preventive measures, because a breakdown in the technical equipment of one of them could disrupt the market considerably. Consequently, the Banking Commission has asked credit institutions to ensure that their security measures are adequate, and to strengthen them where necessary.

### *(c) Preventing liquidity and credit risks*

Revocability of payments in the event of default by one of the clearers means possible liquidity risks for its counterparties. These could in turn generate credit risks and could disrupt the interbank market.

The terms of the risk-reduction programme (see Section 5.3) are designed to reduce considerably liquidity and credit risks arising from interbank exchanges.

### *(d) Structural factors*

At present, credit institutions are entirely free to manage their cash during the day because, as a general rule, their only obligation is to ensure that their current accounts on the Banque de France's books are not in debit at the end of the accounting day. Moreover, because Paris has no system for recording money market operations in real time, these operations are processed ex post (these being for the most part payments made as "avals de trésorerie" through the Paris clearing house). The banks, having no need to concern themselves with their central bank balance during the day, do not at present have the means of tracking movements in their accounts in real time.

The implementation of real-time monitoring of credit institutions' accounts at the Banque de France together with the constraints of intraday debit ceilings under the risk-reduction programme (see Section 5.3) would alter the structure of their cash management.

To avoid the build-up of excessive intraday cash shortfalls and to prevent a "deadlock" situation on payments, a Paris money market agreement is currently under discussion. This is expected to minimise cash shortfalls by satisfactorily stacking up certain operations such as repayments of maturing loans immediately followed by borrowings of the same amount. Treasurers will also have access to extensive information in real time on movements in their current account at the central bank, and on the status of payments in the pending queues.

It is too early to make a definitive statement on the possibility that an intraday market may result from implementation of these new measures by the central bank. It is likely, however, that the new structure will give rise to borrowing requirements in order to cover temporary intraday cash shortfalls.

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Table 1

**Basic statistical data**

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Population: | | | | | |
| *year-end (millions)* ..... | *55.7* | *56.3* | *56.6* | *56.9* | *57.2* |
| GDP (FRF billions) ..... | 5,735.1 | 6,159.7 | 6,505.5 | 6,746.9 | 6,997.6 |
| GDP per capita ..... | 102,964 | 109,409 | 114,938 | 118,575 | 122,336 |
| Exchange rate (domestic currency vis-à-vis USD): | | | | | |
| *year-end* ..... | *6.094* | *5.788* | *5.129* | *5.180* | *5.393* |
| *average* ..... | *5.959* | *6.381* | *5.447* | *5.642* | *5.294* |

Table 2

**Settlement media used by non-banks**

(at year-end, not seasonally adjusted, in billions of French francs)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Notes and coin ..... | 235.5 | 246.5 | 255.5 | 254.4 | 255.5 |
| Transferable deposits[1] ..... | 1,273.0 | 1,378.6 | 1,433.0 | 1,354.7 | 1,351.6 |
| *of which held by:* | | | | | |
| *corporate sector* ..... | *295.7* | *330.9* | *346.3* | *308.6* | *303.3* |
| *households* ..... | *701.1* | *758.4* | *782.9* | *774.2* | *793.2* |
| *others* ..... | *276.2* | *289.3* | *303.8* | *271.9* | *255.1* |
| Narrow money supply ($M_1$)[2] ..... | 1,508.6 | 1,625.0 | 1,688.5 | 1,609.2 | 1,607.1 |
| Broad money supply ($M_3$)[3] ..... | 4,219.1 | 4,614.2 | 5,024.9 | 5,150.5 | 5,419.4 |

[1] Excluding foreign currency deposits. [2] $M_1$ = notes and coin and French franc denominated sight deposits held by non-banks (overseas territories excluded). [3] $M_3 = M_1$ + taxable passbook accounts, Savings Banks "A" passbook deposits and Mutual Credit Bank "blue" books, popular savings books (LEP), industrial development accounts (CODEVI) and housing savings accounts (CEL) + foreign currency denominated assets, time deposits and money market securities issued by credit institutions.

Table 3

**Settlement media used by banks**

(at year-end, not seasonally adjusted, in billions of French francs)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Reserve balances held at central bank[1] ..... | 68.5 | 81.7 | 67.3 | 52.2 | 18.9 |
| Transferable deposits at other institutions ..... | 2,638.1 | 2,965.9 | 2,926.1 | 2,867.6 | 2,509.5 |
| Accounts at the Post Office ..... | 1.3 | 1.6 | 1.4 | 1.3 | 1.4 |
| Accounts at the Treasury . | 27.0 | 15.7 | 8.7 | 12.5 | 4.7 |
| *Memorandum items:* | | | | | |
| Required reserves ..... | 68.0 | 80.9 | 66.0 | 50.9 | 18.4 |
| Institutions' borrowing from central bank[2] ..... | 220.6 | 263.3 | 172.5 | 187.3 | 321.0 |

[1] Monthly average. [2] Net stock; calls for tender, repurchase agreements and discounting operations.

Table 4

**Banknotes and coin**

(at year-end, not seasonally adjusted, in billions of French francs)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Total banknotes and coin issued[1] | 255.6 | 268.7 | 280.4 | 281.3 | 283.5 |
| Denomination of banknotes:[1] | | | | | |
| *500 francs* | *119.9* | *127.4* | *132.8* | *134.1* | *134.1* |
| *200 francs* | *55.9* | *61.5* | *67.6* | *70.3* | *73.4* |
| *100 francs* | *57.8* | *56.3* | *55.3* | *52.4* | *50.6* |
| *50 francs* | *5.6* | *5.8* | *5.9* | *5.9* | *6.0* |
| *20 francs* | *1.1* | *1.1* | *1.2* | *1.2* | *1.1* |
| *10 francs* | *0.4* | *0.4* | *0.4* | . | . |
| Banknotes held by credit institutions[2] | 11.7 | 12.8 | 14.3 | 15.3 | 15.6 |
| Total banknotes and coin outside credit institutions[2] | 235.5 | 246.5 | 255.5 | 254.4 | 255.5 |
| *Memorandum item*: | | | | | |
| Banknotes held in overseas territories | 8.4 | 9.5 | 10.6 | 11.5 | 12.4 |

[1] Including banknotes issued in overseas territories. [2] Banknotes issued in overseas territories are not included.

Table 5

**Institutional framework**

(at end-1992)

| Categories | Number of institutions | Number of branches | Number of accounts (thousands) | Value of accounts (FRF billions) |
|---|---|---|---|---|
| Central bank ..... | 1 | 212 | 83 | 3.1 |
| Commercial banks ..... | 419[1] | 10,366 | 19,993 | 597.7 |
| Savings banks ..... | 36 | 4,297 | 8,021 | 39.4 |
| Cooperative and rural banks ... | 155 | 10,738 | 23,520 | 362.9 |
| Post Office ..... | 1 | 16,855 | 9,388 | 167.0 |
| Municipal credit banks ..... | 22 | 78 | 138 | 0.9 |
| Treasury ..... | 1 | 3,955 | 886 | 126.7 |

[1] Branches of foreign banks: 80; foreign-owned banks: 101.

Table 6

**Cash dispensers, ATMs and EFTPOS terminals**

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Cash dispensers and ATMs: | | | | | |
| *Number of networks* ..... | *1* | *1* | *1* | *1* | *1* |
| *Number of machines* ..... | *11,457* | *13,031* | *14,428* | *16,134* | *17,432* |
| *Volume of transactions (thousands)*[1] ..... | *445,479* | *495,289* | *547,720* | *614,052* | *607,152* |
| *Value of transactions (FRF millions)*[1] ..... | *199,865* | *228,383* | *242,822* | *288,852* | *306,994* |
| EFTPOS: | | | | | |
| *Number of networks* ..... | *1* | *1* | *1* | *1* | *1* |
| *Number of terminals*[2] ..... | *120,000* | *160,000* | *180,000* | *203,000* | *320,000* |
| *Volume of transactions (thousands)*[2] ..... | *416,000* | *618,000* | *933,000* | *1,051,000* | *1,300,000* |
| *Value of transactions* ..... *(FRF millions)*[2] ..... | *202,398* | *259,357* | *303,515* | *346,650* | *430,000* |

[1] Including intrabank cash withdrawals and cash withdrawals processed through selected interbank payment systems. [2] Estimated.

Table 7

**Number of payment cards in circulation**[1]

(in thousands)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Cards with a cash function ..... | 17,342 | 18,691 | 19,955 | 20,629 | 21,072 |
| Cards with a debit/credit function ..... | 17,258 | 18,597 | 19,393 | 19,743 | 20,892 |
| *of which:* | | | | | |
| *cards with a debit function* ..... | *17,258* | *18,597* | *19,393* | *19,743* | *20,892* |
| *cards with a credit function* ..... | *152* | *214* | *276* | *345* | *453* |
| Cards with a cheque guarantee function ..... | 150 | 99 | 86 | 82 | 192 |
| Retailer cards (estimated) | 18,000 | 18,000 | 20,000 | 20,000 | 20,000 |

[1] A card with multiple functions may appear in several categories. It is, therefore, not meaningful to add the figures.

Table 8

**Payment instructions handled by selected payment systems: volume of transactions**

(in millions)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Clearing houses | 3,546.1 | 3,544.1 | 3,589.4 | 3,625.9 | 3,652.0 |
| *of which:* | | | | | |
| *cheques* | *3,486.1* | *3,494.3* | *3,547.9* | *3,597.0* | *3,633.4* |
| *credit transfers* | *9.3* | *8.7* | *7.2* | *5.6* | *3.8* |
| *bills of exchange* | *41.0* | *32.2* | *25.8* | *17.8* | *9.5* |
| *avals de trésorerie* | *1.0* | *0.9* | *0.6* | *0.6* | *0.4* |
| *large-value credit transfers* | *8.7* | *8.0* | *7.9* | *4.9* | *4.9* |
| Automated clearing houses | *2,547.2* | *2,963.7* | *3,250.6* | *3,623.9* | *3,952.4* |
| CREIC (truncated cheques system) | 123.5 | 178.8 | 201.6 | 214.8 | 230.8 |
| Ordinateur de compensation | 1,437.3 | 1,591.2 | 1,722.7 | 1,874.7 | 1,811.0 |
| *of which:* | | | | | |
| *credit transfers* | *646.8* | *697.6* | *742.5* | *802.2* | *781.4* |
| *LCRs and paperless bills of exchange* | *99.1* | *113.3* | *124.1* | *126.8* | *124.3* |
| *direct debits* | *456.8* | *508.8* | *560.2* | *620.1* | *588.1* |
| *interbank payment orders* | *5.0* | *7.7* | *9.0* | *17.0* | *41.2* |
| *ATM withdrawals* | *210.5* | *236.2* | *256.2* | *269.8* | *229.2* |
| *card payments* | *19.1* | *27.7* | *30.7* | *38.8* | *46.8* |
| Interbank Teleclearing System (SIT) | - | - | - | *43.7* | *301.8* |
| *of which:* | | | | | |
| *credit transfers* | - | - | - | *18.0* | *107.5* |
| *LCRs and paperless bills of exchange* | - | - | - | *3.6* | *10.5* |
| *direct debits* | - | - | - | *8.2* | *90.3* |
| *interbank payment orders* | - | - | - | *0.2* | *2.5* |
| *ATM withdrawals* | - | - | - | *13.7* | *91.0* |
| Cartes bancaires | *986.4* | *1,193.7* | *1,326.3* | *1,490.7* | *1,608.8* |
| *ATM withdrawals* | *170.1* | *190.8* | *189.7* | *215.1* | *220.3* |
| *card payments* | *816.3* | *1,002.9* | *1,136.6* | *1,275.6* | *1,388.5* |

Table 8 (contd.)

**Payment instructions handled by selected payment systems: volume of transactions**

(in millions)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Banque de France ..... | *49.4* | *50.0* | *48.2* | *46.8* | *42.7* |
| *of which:* | | | | | |
| *Treasury transfers* ..... | *45.4* | *46.5* | *45.2* | *44.0* | *39.6* |
| *Interbank credit transfers* ..... | *0.9* | *0.8* | *0.5* | *0.4* | *0.9* |
| *Banque de France large-value credit transfers* ..... | *2.5* | *2.0* | *1.7* | *1.5* | *1.3* |
| *telegraphic credit transfers* ..... | *0.6* | *0.7* | *0.8* | *0.9* | *0.9* |
| Sagittaire large-value credit transfers ..... | 1.4 | 1.8 | 2.5 | 2.9 | 3.3 |

Table 9

**Payment instructions handled by selected payment systems: value of transactions**

(in billions of French francs)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Clearing houses | 115,038.2 | 116,558.4 | 128,205.4 | 120,023.5 | 128,371.3 |
| *of which:* | | | | | |
| *cheques* | *9,699.9* | *10,436.5* | *11,357.2* | *11,634.9* | *11,582.0* |
| *credit transfers* | *952.9* | *1,044.7* | *1,150.6* | *1,228.3* | *1,275.5* |
| *bills of exchange* | *918.6* | *812.1* | *663.0* | *509.3* | *316.1* |
| *avals de trésorerie* | *73,126.8* | *72,068.5* | *80,861.0* | *71,354.0* | *73,179.0* |
| *large-value credit transfers* | *30,340.0* | *32,196.6* | *34,173.6* | *35,297.0* | *42,018.7* |
| Automated clearing houses | *5,083.4* | *6,133.3* | *6,978.1* | *7,936.3* | *8,596.6* |
| CREIC (truncated cheques system) | 69.5 | 97.1 | 111.1 | 119.8 | 129.1 |
| Ordinateur de compensation | 4,746.2 | 5,604.4 | 6,398.4 | 7,178.6 | 7,661.6 |
| *of which:* | | | | | |
| *credit transfers* | *2,015.4* | *2,294.2* | *2,639.4* | *3,104.3* | *3,458.6* |
| *LCRs and paperless bills of exchange* | *1,983.1* | *2,446.1* | *2,774.6* | *2,969.3* | *3,065.5* |
| *direct debits* | *644.3* | *740.6* | *850.1* | *959.7* | *991.2* |
| *interbank payment orders* | *9.5* | *17.8* | *21.1* | *29.0* | *47.2* |
| *ATM withdrawals* | *90.8* | *100.6* | *106.8* | *107.9* | *88.7* |
| *card payments* | *3.1* | *5.1* | *6.4* | *8.4* | *10.4* |
| Interbank Teleclearing System (SIT) | | | | *98.8* | *234.9* |
| *of which:* | | | | | |
| *credit transfers* | - | - | - | *43.8* | *103.8* |
| *LCRs and paperless bills of exchange* | - | - | - | *39.1* | *23.9* |
| *direct debits* | - | - | - | *9.8* | *69.0* |
| *interbank payment orders* | - | - | - | *0.6* | *2.6* |
| *ATM withdrawals* | - | - | - | *5.5* | *35.6* |
| Cartes bancaires | *328.7* | *411.7* | *468.5* | *539.1* | *571.0* |
| *ATM withdrawals* | *78.8* | *92.6* | *95.5* | *114.2* | *109.8* |
| *card payments* | *249.9* | *319.1* | *373.0* | *424.9* | *461.2* |

Table 9 (contd.)

**Payment instructions handled by selected payment systems: value of transactions**

(in billions of French francs)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Banque de France ..... | *31,080.6* | *33,401.5* | *37,054.1* | *40,378.3* | *42,547.8* |
| *of which:* | | | | | |
| *Treasury transfers* ..... | *613.6* | *655.9* | *746.7* | *691.8* | *467.8* |
| *Interbank credit transfers* ..... | *130.5* | *141.1* | *160.0* | *158.6* | *131.3* |
| *Banque de France large-value credit transfers* ..... | *23,881.4* | *25,804.1* | *28,589.7* | *32,015.4* | *34,466.4* |
| *telegraphic credit transfers* ..... | *6,455.1* | *6,800.4* | *7,557.7* | *7,512.5* | *7,482.3* |
| Sagittaire large-value credit transfers ..... | 12,977.0 | 22,794.0 | 35,393.0 | 43,845.0 | 59,219.0 |

Table 10

**Transfer instructions handled by securities settlement systems: volume of transactions**

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| **SATURNE:** | | | | | |
| *Treasury bills* ..... | *82,566* | *98,373* | *102,374* | *109,837* | *126,904* |
| *BMTN*[1] ..... | - | - | - | - | *3,639* |
| *Other TCN*[2] ..... | . | . | . | *8,378* | *6,160* |

[1] Medium-term notes (transferred through SATURNE for the first time in 1992). [2] Short-term negotiable instruments.

Table 11

**Transfer instructions handled by securities settlement systems: value of transactions**

(in billions of French francs)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| **SATURNE:** | | | | | |
| *Treasury bills* | *3,199.4* | *3,945.2* | *3,971.7* | *5,203.8* | *10,199.8* |
| *BMTN*[1] | - | - | - | - | *174.8* |
| *Other TCN*[2] | . | . | . | *373.3* | *342.9* |
| **RELIT:**[3] | | | | | |
| *Treasury bonds* | - | - | - | - | *11,400* |
| *French stocks* | - | - | - | - | *2,600* |
| *Mutual funds* | - | - | - | - | *8,200* |
| *Others* | - | - | - | - | *3,800* |

[1] Medium-term notes (transferred through SATURNE for the first time in 1992). [2] Short-term negotiable instruments. [3] The RELIT DVP system began full-scale operation in 1992.

Table 12

**Indicators of use of various cashless payment instruments: volume of transactions**

(in millions)

| Instruments | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Cheques issued | 4,540.0 | 4,627.2 | 4,876.8 | 4,776.4 | 4,868.7 |
| Payments by debit and credit card | 835.4 | 1,030.6 | 1,167.3 | 1,314.5 | 1,435.2 |
| Paper-based credit transfers | 117.8 | 111.9 | 97.5 | 87.9 | 76.1 |
| *of which:* | | | | | |
| *customer initiated* | *105.0* | *100.3* | *86.5* | *80.0* | *68.6* |
| *interbank/large-value* | *12.8* | *11.6* | *11.0* | *7.9* | *7.5* |
| Paperless credit transfers | 1,097.8 | 1,159.5 | 1,243.7 | 1,302.7 | 1,404.0 |
| *of which:* | | | | | |
| *customer initiated* | *1,096.4* | *1,157.7* | *1,241.2* | *1,299.8* | *1,400.7* |
| *interbank/large-value* | *1.4* | *1.8* | *2.5* | *2.9* | *3.3* |
| Direct debits | 696.4 | 767.3 | 844.9 | 853.7 | 979.6 |
| Bills of exchange | 199.5 | 192.1 | 170.0 | 163.3 | 159.3 |
| ATM withdrawals | 445.6 | 495.3 | 547.7 | 614.1 | 670.2 |
| **Total** | 7,933.5 | 8,383.9 | 8,947.9 | 9,112.6 | 9,593.1 |

Table 13

**Indicators of use of various cashless payment instruments: value of transactions**

(in billions of French francs)

| Instruments | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Cheques issued ..... | 16,485 | 17,582 | 18,783 | 16,276 | 16,099 |
| Payments by debit and credit card ..... | 253 | 324 | 379 | 433 | 472 |
| Paper-based credit transfers ..... | 136,327 | 139,581 | 154,156 | 149,262 | 159,943 |
| *of which:* | | | | | |
| *customer initiated* ..... | *2,534* | *2,711* | *2,974* | *3,083* | *2,797* |
| *interbank/large-value* | *133,793* | *136,870* | *151,182* | *146,179* | *157,146* |
| Paperless credit transfers | 17,513 | 27,830 | 41,137 | 50,231 | 68,816 |
| *of which:* | | | | | |
| *customer initiated* ..... | *4,536* | *5,036* | *5,744* | *6,386* | *9,597* |
| *interbank/large-value* | *12,977* | *22,794* | *35,393* | *43,845* | *59,219* |
| Direct debits ..... | 1,304 | 1,467 | 1,359 | 1,499 | 1,557 |
| Bills of exchange ..... | 3,545 | 3,800 | 3,826 | 3,813 | 3,690 |
| ATM withdrawals ..... | 200 | 228 | 243 | 289 | 307 |
| **Total** ..... | 175,627 | 190,812 | 219,883 | 221,803 | 250,884 |

Table 14

**Participation in S.W.I.F.T. by domestic institutions**[1]

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Members | 93 | 100 | 103 | 105 | 109 |
| *of which: live* | *86* | *96* | *100* | *104* | *101* |
| Sub-members[2] | 56 | 63 | 72 | 83 | 87 |
| *of which: live* | *54* | *56* | *66* | *81* | *80* |
| Participants[3] | 3 | 3 | 3 | 4 | 4 |
| *of which: live* | *1* | *1* | *2* | *3* | *3* |
| Total users | 152 | 166 | 178 | 192 | 200 |
| *of which: live* | *141* | *153* | *168* | *188* | *184* |
| *Memorandum items:* | | | | | |
| Total S.W.I.F.T.: | | | | | |
| *members* | *1,581* | *1,697* | *1,812* | *1,963* | *2,074* |
| *sub-members* | *1,228* | *1,315* | *1,469* | *1,607* | *1,738* |
| *participants* | *27* | *37* | *63* | *78* | *91* |
| *users* | *2,836* | *3,049* | *3,344* | *3,648* | *3,903* |

[1] Data for France include Monaco, Guadeloupe, Martinique and Reunion. [2] Domestic users sponsored by members abroad. [3] Participants are not shareholders in S.W.I.F.T. and their message traffic over the network is restricted.

*Source*: S.W.I.F.T.

Table 15

**S.W.I.F.T. message flows to/from domestic users**[1]

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Total messages sent ..... | 19,139,700 | 23,003,600 | 25,565,700 | 27,710,200 | 30,310,818 |
| *of which:* | | | | | |
| *category I* ..... | *6,115,800* | *7,810,900* | *7,607,000* | *7,999,200* | *8,533,000* |
| *category II* ..... | *5,662,100* | *7,089,100* | *8,493,700* | *9,603,300* | *10,450,100* |
| *sent to domestic users* ..... | *4,231,000* | *5,758,800* | *7,233,600* | *8,226,500* | *9,386,200* |
| Total messages received ..... | 16,971,500 | 19,938,200 | 23,166,600 | 25,896,300 | 28,460,152 |
| *of which:* | | | | | |
| *category I* ..... | . | . | . | . | *8,753,700* |
| *category II* ..... | . | . | . | . | *10,472,800* |
| *received from domestic users* ..... | . | . | . | . | *11,384,100* |
| *Memorandum item:* | | | | | |
| Global S.W.I.F.T. traffic .. | 255,142,610 | 298,780,982 | 332,895,932 | 365,159,291 | 405,540,962 |

[1] Data for France include Monaco, Guadeloupe, Martinique and Reunion.

*Source*: S.W.I.F.T.

**Methodology and sources used for the compilation of Tables 12 and 13**

The figures combine the data relating to all payment instruments, irrespective of whether they are routed via "official" circuits or not.

The statistical data relating to transactions routed via "official " circuits are obtained from the clearing houses for paper-based instruments and from the computer clearing centres, the CREIC and the Bank Card Consortium for paperless instruments.

The figures for the transactions that are not routed via "official" circuits are taken from a statistical survey made by the Banque de France with main credit institutions and the Post Office.

Statistical data on cheques include postal cheques, those used to obtain cash and truncated cheques.

The transactions relating to payments by credit cards give rise to settlement in the form of a direct debit or, more rarely, a cheque. It is not possible to isolate them and they are not shown in the table.

Payments by debit cards are only routed via "official" circuits. Statistical data are obtained from the Bank Card Consortium for transactions not exchanged through the computer clearing centres.

The figures relating to paper-based credit transfers include Treasury transfers and retail credit transfers submitted to the Banque de France by the credit institutions and the Post Office and not exchanged through the clearing houses, and credit transfers of a purely interbank nature.

Paperless credit transfers are bulk operations (mainly wages and pensions).

Statistical data on direct debits include figures for interbank payment orders.

# PAYMENT SYSTEMS IN GERMANY

# Table of contents

# 1. INSTITUTIONAL ASPECTS

## 1.1 General legal aspects

Under the Banking Act of 1961 (as amended in 1993), "the performance of cashless payment and clearing operations (giro business)" is a banking activity. This requires a licence from the Federal Banking Supervisory Office, except in cases where special laws authorise individual institutions (e.g. the Bundesbank, the Postbank) to provide payment services. Hence, the problem of non-banks handling cashless payment transactions does not arise. Under the terms of the Banking Act, "Banks are enterprises conducting banking business, if the scale of such business calls for a commercially organised business undertaking". Besides giro business, banking business includes inter alia securities business (i.e. the purchase and sale of securities for the account of others) and safe custody business (i.e. the safe custody and administration of securities for the account of others).

The Deutsche Bundesbank Act (1957) lays down the responsibilities and powers of the central bank in Germany.

There are no specific laws governing the organisational and technical aspects of payment services. The provisions of the Civil Code (1896) are generally applicable, in particular those concerning the law of agency. In addition, the provisions of the Cheques Act (1933) must be observed in connection with the collection of cheques. In order to manage the large volumes of cashless payments efficiently, the providers of payment services have established certain rules for the execution of payments, within the framework laid down by law. In particular:

- the relationship between the banks, the Postbank and the Bundesbank is regulated by agreements between the central associations of the banking industry and the central bank (see Section 1.5);
- the relationship with bank customers is regulated by the general terms of business of the banks, the Postbank and the central bank and by special regulations, notices and standardised forms.

Under the Act for the Prevention of Restraints on Competition (1966) any agreement to standardise payment services (whether contractual or not) must be reported to the Federal Cartels Office through the Federal Banking Supervisory Office with a statement of reasons. These agencies must ensure that the agreement has no undesirable implications from the banking supervisory point of view, does not unduly restrict competition and, in particular, does not place other participants in the payment system (especially bank customers) at an unfair disadvantage. Any such agreement that is not notified is null and void.

## 1.2 The role of financial intermediaries

### *1.2.1 Payment networks*

In Germany the responsibility for supplying the economy and the public with cash and for providing cashless payment facilities lies with the credit institutions, the Postbank and the central bank. In addition, the credit card companies engage in credit card business.

Most of the 4,055 credit institutions (at end-1992, with around 49,685 branches, excluding the Postbank and the central bank) are actively involved in the payment system. Within the framework of the existing universal banking system all but a few of them belong to one of the

following three banking categories, which form separate payment networks[1] based on internally agreed exchange and settlement procedures (see Annex 1):

- commercial banks, of which the "Big Three" have each set up an extensive payment network linking their branches;
- savings banks (the overwhelming majority of which are public-law institutions), whose operations are restricted to a particular municipality or region. The 717 savings banks and their thirteen central institutions form a single payment network;
- cooperative banks, whose markets are likewise geographically restricted. Like the savings banks, the 2,911 cooperative banks and their four central institutions form a single payment network. (See also Table 5.)

The Postbank operates a further payment network for cashless transfers by its account holders. The Bundesbank's giro network is the most important link for payments traffic passing between the networks of the banking industry and the Postbank (see Sections 1.3.2 and 5.2).

At the end of 1992 the credit institutions and the Postbank managed around 77.4 million giro accounts for domestic non-banks with sight deposits totalling DM 468.3 billion. Market shares for giro accounts and sight deposits respectively at the end of 1992 were as follows: commercial banks, 20% of accounts and 33% of deposits; savings banks, 47% and 40%; cooperative banks, 26% and 22%; Postbank, 7% and 5%. 144 foreign banks (of which fifty-five from EC member states) were operating in Germany at the end of 1992.

### *1.2.2 The credit institutions' pricing policy*

The pricing policy of the private sector banks is based on free market principles, with competitive considerations and the institution's business policy playing a role. The terms offered to corporate customers may also depend on the business relations with the individual customer.

In general, efficient procedures (e.g. submission of orders in paperless form, the use of cash dispensers and other self-service systems) attract lower charges. For cashless transactions, as well as account-keeping fees there are usually also charges per entry and per item for orders presented; personal customers are often offered a package of services for a flat-rate fee.

For cash transactions, too, there are charges for incoming and outgoing payments (including rolls of coin) and for the use of night-safe facilities.

Banks' charges for standard transactions are subject to the regulation on price information and must be published accordingly.

### *1.2.3 The bank code number*

Banking establishments which provide payment system services are identified by bank code numbers under an agreement between the Bundesbank and the banking associations. The bank code number is also the establishment's giro account number with the Bundesbank. Cashless payments processed in the Bundesbank's giro network are passed to the giro account indicated by the bank code number except where another routing (e.g. the central institution) has been agreed with the Bundesbank, as is possible in some cases. The Bundesbank is responsible for the allocation, replacement and withdrawal of bank code numbers.

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1 The terms "payment network" and "giro network" are used as synonyms.

## 1.3 The role of the central bank

### *1.3.1 Cash payments*

Under the Deutsche Bundesbank Act, the Bundesbank is required to regulate the volume of currency in circulation, at the same time providing the economy with banknotes and coin in the denominations required. For this purpose, the Bundesbank is vested with the sole right of note issue, and is responsible for producing, supplying and regularly renewing banknotes, replacing damaged notes, calling in notes and checking the currency in circulation for counterfeits. The Bundesbank does not, however, operate its own note-printing works. The right to issue coin (the minting prerogative) lies with the Federal Government (Ministry of Finance), from which the Bundesbank acquires the coin needed for circulation at face value.

### *1.3.2 Cashless payments*

The Deutsche Bundesbank Act requires the Bundesbank to provide for the execution by banks of domestic and external payments. It fulfils its statutory obligations by providing the banks and the Postbank with a payment network that has a neutral impact on competition and by offering Bundesbank account holders its cashless payment services (see Section 5.2 for details). With 188 branch offices (in December 1993) and eight computer centres, it forms the link between the payment networks of the banking industry and the Postbank. The central bank also exerts a certain influence on the banks' terms for the provision of payment services through its own terms of business, its handling procedures, its debiting and crediting terms and its scale of charges.

The German credit institutions make extensive use of the central bank giro network, especially for inter-network payments. In 1992, a total of 3,118 million credit transfers, cheques and direct debits were transmitted via the Bundesbank's payment facilities, representing about one-third of the payment orders received by the credit institutions from their customers. The credit institutions themselves are free to decide whether and to what extent they route payments via the Bundesbank instead of through their own networks, and whether they use the central bank's local clearing or its intercity system. The Bundesbank can regulate the extent to which they use its facilities through its fees and conditions (see Section 5.2.5). The central bank's payment network is virtually the only means available to the smaller private sector banks to execute payments to other credit institutions on behalf of their customers without having to depend on their competitors.

In addition to the clearing and settlement function it performs for the banking industry, the Bundesbank acts as banker to the Federal Government and, to a limited extent, to the Länder and handles their payments.

### *1.3.3 Banking supervision*

The Banking Act forms the legal basis for banking supervision. The purpose of the Act is to safeguard the viability of the banking industry, which is particularly vulnerable to any loss of confidence, by providing protection for depositors. The Act seeks to achieve this objective while respecting free market principles. The banks' activities are restricted only by quantitative general requirements and by the obligation to open their books to the supervisory authorities.

Banking supervision is carried out by the Federal Banking Supervisory Office in cooperation with the Bundesbank. The Banking Act assigns the central role in banking supervision to the Federal Banking Supervisory Office. The Bundesbank is involved mainly in the day-to-day surveillance of the banks, primarily through the analysis of their reports and returns.

### 1.4 Cashless payment execution times

The banks themselves choose which payment channel to use in the light of their own business policy and the policy of their association. Execution times for cashless payments also depend on the payment channel chosen. Normal execution times within the Bundesbank's payment network are as follows:[2]

- large-value payments (express electronic intercity credit transfer system, referred to as "Eil-ZV"), same-day execution;
- paperless payments (exchange of data media (DTA[3])), one day;
- paper-based payments (MAOBE[4] for regional transactions), one day;
- paper-based payments (MAOBE for inter-regional transactions), two days.

However, the total execution time for a payment also depends on the processing times at the first and last institutions involved, which may vary greatly depending on the type of payment and the banks' organisation. These processing times must be added to the execution times within the Bundesbank's network in order to arrive at the total time taken for a payment to be executed.

### 1.5 The role of other private and public sector bodies

Within the limits set by German anti-trust legislation, for over thirty years the banking industry has coordinated organisational and technical procedures through the Management Working Party of its central associations so as to ensure a cost-effective, rapid and secure payment system. The various categories of banks are represented on the Working Party by their respective associations. As a result of this coordination, a series of agreements have been reached to standardise the handling of interbank payments, and consequently payment transactions on behalf of customers. The Bundesbank participates in the discussions and has itself acceded to most of the agreements in order to ensure, in the interests of an efficient payment system, that procedures are standardised and that documents and data records can pass from one network to another.

Since 1982 the German banking industry has had a national payments organisation in the form of the *Gesellschaft für Zahlungssysteme mbH (GZS)*, which concerns itself primarily with the Eurocard and eurocheque card systems and their further development and also with the cross-border collection of eurocheques. The commercial banks and the savings banks each hold 40% and the cooperative banks 20% of the capital of the GZS.

## 2. PAYMENT MEDIA USED BY NON-BANKS

### 2.1 Cash payments

In Germany, households use cash for most of their everyday payment requirements.

Currency in circulation consists of banknotes in eight denominations (DM 5, 10, 20, 50, 100, 200, 500 and 1,000) and federal coins also in eight denominations (1, 2, 5, 10 and 50 Pfennig and DM 1, 2 and 5). There are also small quantities of DM 10 coins, but these are principally collectors' items and are rarely used in payment transactions. Banknotes and coin are legal tender,

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2 The procedures are discussed in greater detail in Sections 3 and 5.

3 DTA = *belegloser Datenträgeraustausch*, i.e. paperless exchange of data media.

4 MAOBE = *Maschinell optische Beleglesung*, i.e. OCR document reading.

although coins have to be accepted only up to a certain amount. At end-1992 total currency in circulation - including cash in bank vaults - amounted to DM 227 billion, with banknotes accounting for DM 213 billion (94%) and coin for DM 14 billion (6%). Cash in bank vaults amounted to DM 24 billion.

The use of machines for cash withdrawals is increasing in Germany. This is especially true for the standardised system of "ec" cash dispensers (see Section 2.2.3 (d)).

## 2.2 Non-cash payments

### *2.2.1 Sight deposits of domestic non-banks*

Businesses and households in Germany hold their transactions balances predominantly as sight deposits at banks, not in the form of cash. At the end of 1992 the sight deposits of domestic non-banks totalled DM 468.3 billion. These deposits (payable on demand or at less than one month's notice) are used for carrying out cashless payment transactions and they bear little interest (e.g. 0.5%; no interest is paid on Bundesbank accounts). Time deposits (at one month to four years) and savings deposits are considered to be close substitutes for transactions balances.

### *2.2.2 Payments by means of credit transfers, cheques and direct debits*

In Germany cashless payments are effected by means of credit transfers (50% of the total number of transactions in 1992), cheques (9%) and direct debits (39%). Other payment instruments, such as money orders, and payments using credit or debit cards are relatively unimportant, accounting for less than 2% of transactions.

#### *(a) Credit transfers*

The credit transfer traditionally predominates in Germany, although its share in total payments is lower than it used to be (in the savings bank sector, for example, it has fallen from 72% of customers' cashless payments in 1966 to 67% in 1972, and 58% in 1992), because for specific purposes other, more appropriate payment methods are used, particularly direct debits.

Customers can also give their banks standing orders for regular payments to specific payees (e.g. rent to the landlord). The bank then undertakes to execute a credit transfer on the date specified (e.g. the last day of the month).

Payers with electronic data-processing equipment are in principle obliged to use electronic data media (magnetic tape or, for smaller volumes, diskettes or cassettes) to submit regular bulk payments (e.g. wages, salaries, state social insurance payments) to the banks for execution via the data media clearing. Increasingly, such payments are now being handled via telecommunication, not just between banks but also between banks and their customers.

As early as 1984 the banking associations and the Deutsche Bundespost, with the participation of the central bank, reached agreement on the conversion of paper-based credit transfers into data records and their transmission within the electronic payment transfer (EZÜ[5]) system. Since January 1992, the first bank in the chain handling a paper-based intercity credit transfer for DM 10,000 or more is required to convert it into a data record (EZÜ requirement). Independently of this agreement, the banks have made considerable progress in recent years with the integration of documents into the electronic payment system. For example, within the different banking categories institutions with OCR equipment in some cases already convert credit transfers submitted in paper form without value limits.

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5 *Elektronischer Zahlungsverkehr Überweisung.*

In parallel with their efforts to convert paper media, the banks are trying to persuade corporate customers to submit not just their instructions for bulk payments but also those for other credit transfers on data media or by telecommunication in order to eliminate paper from the outset. They are increasingly providing customers with appropriate electronic banking products for this purpose.

Incoming electronic credit transfers can be automatically booked through to a customer's account and the essential details printed out in the statement of account. Paper-based credit transfers, on the other hand, are delivered to the payee as attachments to the statement of account.

In 1992, out of a total of approximately 5.1 billion credit transfer orders initiated by corporate and personal customers, some 2.8 billion were presented in paperless form. The remaining 2.3 billion were issued in paper form and for the most part were processed in that form through the optical reading of their OCR-A code lines. However, some of the credit transfers presented in paper form are converted under the EZÜ requirement. Including documents converted under the EZÜ procedure, the proportion of credit transfers executed in paperless form amounted to around 61% in 1992, or about 3.1 billion items.

### *(b) Cheques*

In Germany the cheque has never acquired the same importance as in most other western countries; in 1992 it accounted for only 8.8% of total cashless transactions by non-banks in volume terms and 15% in value terms. Businesses predominantly use credit transfers and direct debits, as these can be processed on a paperless basis irrespective of the amount involved. The cheques circulating in Germany are mostly eurocheques which are backed by the eurocheque card; these are used by individuals to pay for consumer goods and services. In this context the guarantee of payment associated with the eurocheque card has greatly contributed to the spread of cheques in Germany (for the eurocheque system, see also Chapter 12).

Under the German Cheques Act, the drawee bank may not certify a cheque in such a way as to signify that it undertakes to pay against it. The purpose of this prohibition is to prevent cheques acquiring a function similar to that of banknotes. An exception is made for the central bank, which may, if cover is available, confirm that it will pay against a cheque drawn on it.

The fact that cheques must in principle be collected and presented in paper form has proved a serious disadvantage as far as payments automation is concerned. In 1985 the banking industry, the Deutsche Bundespost and the central bank therefore agreed on a paperless procedure for cheque collection, deliberately waiving the presentation requirement. At present this cheque truncation procedure applies to cheques for less than DM 5,000. As far as possible, the cheques are input by the first bank involved on the basis of the information contained in the code lines, after which collection is paperless. The original cheques are usually microfilmed by the bank which initiates truncation and destroyed after two months. As a result, approximately 70% of all cheques are now truncated. Truncated cheques can be cleared like paperless direct debits and automatically charged to the issuer's account.

### *(c) Direct debits*

The direct debit, which was introduced by the banking associations in 1963, has greatly simplified the collection of regular payments (subscriptions, rents, public utility bills, taxes, etc.). Nowadays more than one-third of all cashless payments in Germany take the form of direct debits and their importance in relation to other payment instruments is still increasing.

The direct debit is made out by the creditor (payee) and presented to his bank for collection from the debtor's (payer's) bank. In contrast to the credit transfer, the payment operation is initiated by the payee, who is thus himself responsible for ensuring that his claim on the payer is settled on time. This presupposes, however, that the payer pre-authorises the payee to collect payment

(collection authorisation) or, by agreement with the payee, authorises his bank to debit his account with direct debits issued by that payee (debit authorisation).

Customers with EDP[6] equipment should in principle use magnetic tape to submit direct debits to banks and the Postbank for collection. As with credit transfers, small volumes of direct debits are also accepted on diskette or cassette. The banks collect the remaining paper-based direct debits together with cheques and use optical character readers to process them. As in the case of credit transfers, the banks have now reached an agreement whereby paper-based direct debits are to be converted into data records at the first bank involved, for example via a terminal or OCR reading, and processed electronically in the interbank clearing system. Direct debits have already attained a high degree of automation (e.g. approximately 90% in the savings bank sector in 1992); in November 1993 the direct debit became the first payment instrument to enjoy fully automated electronic interbank processing following the adoption of a general conversion requirement.

### *2.2.3 Payments by card*

#### *(a) Credit cards*

Credit cards still do not play a major role in Germany, but their use has increased significantly in recent years. The number of cards issued by the major credit card organisations (American Express, Diners Club, VISA, Eurocard in association with MasterCard) rose from around 1.8 million at the end of 1987 to more than 7.4 million at the end of 1992. There has been a parallel increase in the number of businesses accepting credit cards, to around 770,000 at the end of 1992, most of them in retailing and the hotel trade. In 1992 sales to domestic cardholders amounted to approximately DM 33.8 billion. The share of payments by credit card in the total value of cashless payments initiated by non-banks thus amounted to 0.1%. The latter figure shows that credit cards are still used far less frequently than other payment instruments in Germany.

In view of the commission charged, even though this had fallen to an average of less than 3% by 1991, and the inconvenience involved in authorisation and payment procedures, credit cards are not always welcomed by retailers, and their use is confined largely to shops selling luxury goods. In addition, the introduction of the POS electronic cash system (see (e) below) offers retailers a further option for card payments.

Until 1989 the *Gesellschaft für Zahlungssysteme* issued the Eurocard as a credit card for the German banks, but since then the banks have been able to issue the Eurocard themselves. In addition, the VISA card is being issued by a growing number of individual banks. Competition between banks and credit card organisations for credit card business is therefore intensifying. The banks increasingly view credit cards as payment instruments and hence as instruments which promote the use of accounts and which can therefore cement existing customer relationships and attract new customers. Credit cards have thus developed into multifunctional, universal payment instruments.

Traditional credit cards face competition from the credit cards issued by some large retailers with the aim of promoting customer loyalty. For instance, the customer cards of Germany's largest issuer entail no costs or charges, and the cardholder has up to six weeks before payment is due.

#### *(b) Debit cards*

Debit cards are payment cards issued by banks that enable customers to draw on their account also off their bank's premises (e.g. withdrawals from cash dispensers).

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6 Electronic data processing.

The most widely distributed debit card in Germany is the eurocheque card. The addition of a magnetic stripe means that it can now be used not only in the traditional way as a cheque guarantee card but also, in conjunction with a personal identification number (PIN), as a debit card without a cheque (see (d) and (e) below).

The banking industry has also developed special proprietary debit cards specific to a particular bank or to the members of a particular banking association so that customers who are not eligible for a eurocheque card (on grounds of creditworthiness, for example) may also have access to electronic self-service banking.

### *(c) Prepaid cards*

Prepaid cards store prepaid purchasing power and can be used instead of small amounts of cash to pay anonymously for services. One example of a stored-value card in Germany is the telephone card with an integrated microchip issued by the Deutsche Bundespost.

### *(d) "ec" cash dispensers*

Bank customers can now increasingly use their magnetic-stripe eurocheque card ("ec" card) in combination with their PIN to obtain cash up to a certain limit from the cash dispensers of their own or other banks. By the end of 1992 around 19,000 cash dispensers had been installed nationwide. Recently, it has also become possible to use credit cards at "ec" (Eurocard) or other cash dispensers. In order to prevent fraudulent or other illicit withdrawals, all transactions at the "ec" cash dispensers of other banks are checked online against a register of stopped cards and a register of transactions at the authentication centres of the banking associations and the Deutsche Bundespost, which are interconnected by telecommunication lines. Alternatively, it is also possible for authorisation to be given by the cardholder's bank ("on the customer's account") instead of centrally. Withdrawals from cash dispensers are cleared using the normal direct debit procedure via the magnetic tape clearing (see Section 2.2.2 (c)). The system is also gradually being extended to include withdrawals made by German eurocheque cardholders in other European countries, and vice versa.

### *(e) Electronic cash system*

In February 1990, after many years of discussion, the banking industry concluded the "Agreement on an interbank system for cashless payments at automated tills (electronic cash system)", opening the way for a standardised bank POS system based on use of the eurocheque card as a debit card. The system enables holders of cards issued by the German banking industry (eurocheque card, Eurocard, proprietary cards) to pay for goods and services without the use of cash or cheques as well as to obtain cash from "ec" cash dispensers.

Each banking association can decide how to organise its authorisation system, for example authorisation by the cardholder's bank, up to a given limit, etc. The vouchers for the retailer and the purchaser are receipted with a verifiable "electronic signature". The payment is rejected if, for example, the cardholder's payment limit is exceeded, the card has been stopped, or the wrong PIN is input several times.

Relations between businesses using electronic cash terminals and the banking industry are governed by negotiable terms. The retailer pays a fee of 0.3% of the transaction value, but not less than Pf. 15 per transaction, for the banking services (provision of the database link, payment guarantee). For electronic payment with the eurocheque card in the electronic cash system, terminal networks of different, competing network operators are linked to the banking industry's authorisation systems at a high level of security via specified interfaces. A network operator is responsible, among other things, for obtaining authorisation, collecting transaction details from all terminals in the network, calculating the related fees and transferring the transaction details to the bank designated by

the retailer for collection from the card-issuing bank. The retailer is free to decide who should collect payment for purchases made using the system; he simply notifies the network operator of the bank to which payments registered in the operator's computer should be sent and how they should be delivered. Following a steady rise, at the end of 1992 around 14,000 electronic cash terminals had been installed, mainly at petrol stations and retail outlets.

In order to simplify transactions, retailers some time ago developed a procedure allowing payment by eurocheque card without authorisation, whereby the customer signs a collection authorisation printed on the receipt or on a separate voucher. The payment is collected via the normal direct debit data media clearing. The associated risk of the direct debit being rejected if the transaction is disputed, if there is insufficient cover or if the card is stopped is borne solely by the retailer.

In addition to the electronic cash system, in February 1992 the banking industry introduced another procedure for electronic payments using the eurocheque card at POS terminals. The so-called POZ[7] procedure is, on the one hand, intended to satisfy retailers' desire for a payment procedure which is as simple as possible and does not require a PIN. On the other hand, the risk of unauthorised use of the card is limited by the obligation to consult the register of stopped cards for transactions of more than DM 60. Payment risk in the POZ procedure is also borne by the retailer.

### 2.3 Recent developments

The videotex service of the Deutsche Bundespost (BTX), which has been available nationwide since 1984, enables the banks to offer home-banking services. Using either facilities in their own home (a suitably adapted television set or a PC with videotex capability) or a public videotex terminal, customers can communicate in conversational mode with their bank's computer centre via the telephone network and utilise various banking services. As a facility for data transmission, videotex is used mainly by corporate customers and less by personal customers. As is international practice, the banks also offer corporate customers cash management systems; these are not operated as videotex systems, but use formats and transmission routes specific to the particular bank or banking association.

Uniform worldwide standards for electronic business and trade communications are currently being developed under the acronym EDIFACT (Electronic Data Interchange for Administration, Commerce and Transport). With a view to the future execution of both international and domestic payments in accordance with EDIFACT, the German banks and their central associations are participating in the committees drafting the standards and are preparing for the possible processing of EDIFACT messages. The Bundesbank is involved in the various German groups engaged in standardisation and will take the EDIFACT standards into consideration in the payment system in due course.

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7 *POS ohne Zahlungsgarantie des Kreditgewerbes*, i.e. POS without bank guarantee of payment.

# 3. INTERBANK EXCHANGE AND SETTLEMENT CIRCUITS

## 3.1 General overview

### *3.1.1 Cashless payments via the giro networks*

The Big Three banks, the savings bank and credit cooperative organisations and the Postbank operate their own giro networks[8] (see Section 1.2.1). In addition, the Bundesbank makes its own payment network available to the credit institutions.

(a) The credit institutions themselves are free to decide whether and to what extent they route payments via the Bundesbank's network instead of within their own networks, and whether they use the central bank's local clearing or its intercity system.

Both paper-based and paperless intra-network payments addressed to other credit institutions in the same giro network are usually exchanged and settled within the network itself, unless an institution prefers to pass all non-internal items via the central bank, for example in order to take advantage of the comparatively favourable terms with respect to the value date of crediting which the central bank offers in the simplified cheque and direct debit collection procedure (see Section 5.2.3). At some stage in the payment process, however, inter-network payments must be fed into the giro network to which the receiving bank belongs; at the latest, this must occur when the payments reach the locality where the receiving bank is based.

Payment procedures depend on the exchange and settlement facilities available in each case. The following two possibilities exist for local payments (payee in the same locality as the payer):

- direct interbank exchange of items and settlement across accounts that the banks maintain in each other's books, at central clearing institutions or at the central bank; or
- delivery of the payment orders to the central bank, if it has a branch office in the same locality or in the vicinity, for forwarding to the recipient's bank and settlement on the giro accounts held at the central bank branch by the two banks concerned (express paper-based local credit transfer system, see Section 3.2.2; for the local payment system, see also Section 5.2.2).

The first institution to receive instructions for intercity payments (payee's bank in a different locality from the payer's bank) addressed to other credit institutions can channel them into either:

- its own or its association's giro network, or
- the central bank giro network for forwarding to the bank of the payee/payer (see Section 5.2.3).

Usually, the banks keep large-value paper-based credit transfers, and all transfers transmitted via the magnetic tape clearing, within their own giro networks for as long as possible and only pass them to the receiving bank, or its computerised accounting centre, at the last possible stage (e.g. in the local clearing); this practice has advantages for the sending bank in terms of liquidity. By contrast, other credit transfers and items sent for collection (cheques, debits relating to truncated cheques and direct debits) are in many cases sent at the earliest opportunity either to the central bank or directly to the receiving bank's giro network. The use of different routes for different instruments means that the banking industry channels far fewer credit transfers than collection items via the central bank (around 50% of non-banks' collection instructions (2.0 billion items), but only around 20% of non-banks' credit transfers (1.1 billion items) in 1991).

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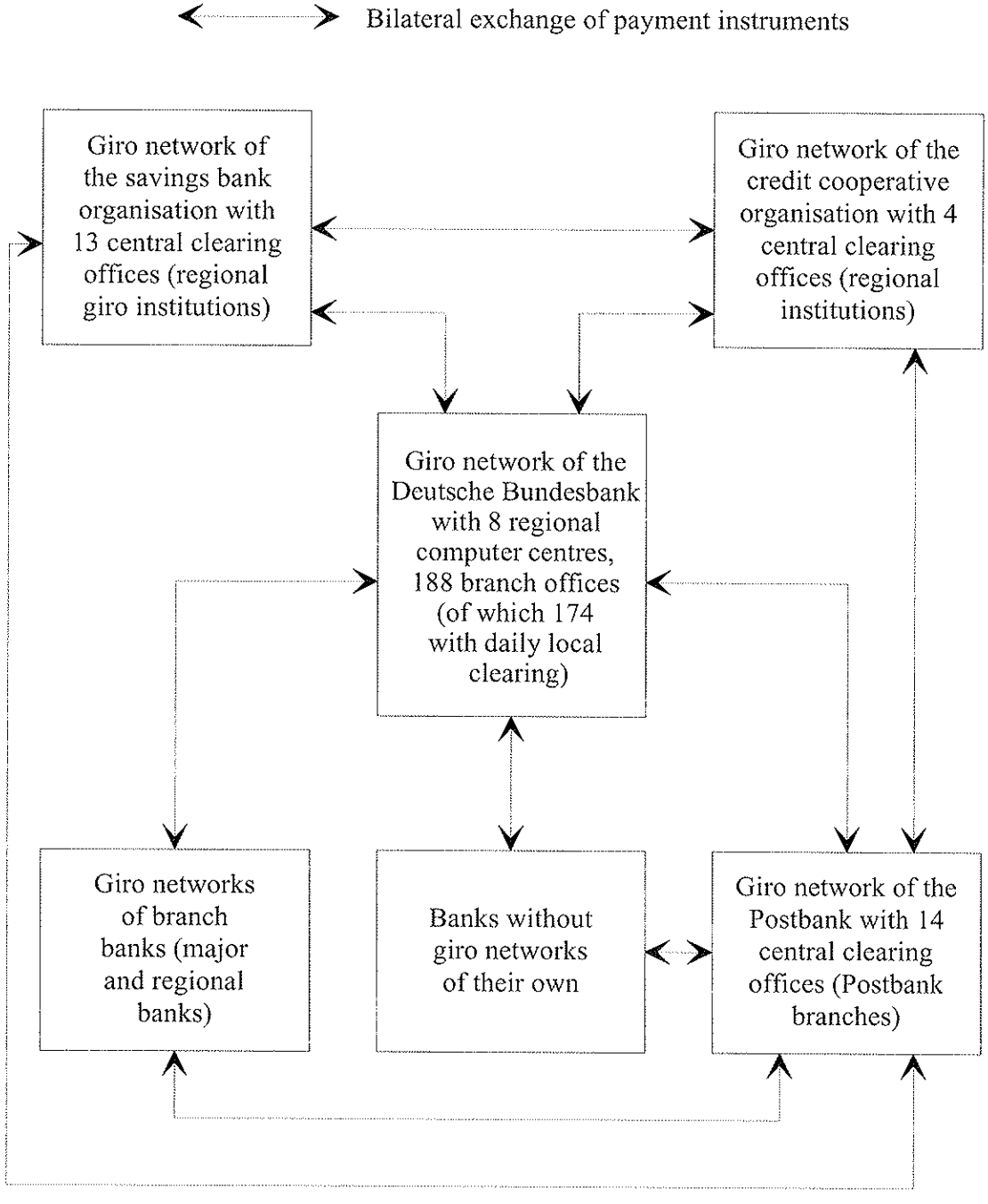
8 The terms "payment network" and "giro network" are used as synonyms.

Chart 1

**Clearing systems in the Federal Republic of Germany***

(for credit transfers, cheques and direct debits)




* As at the end of 1993, except for number of Bundesbank branch offices with daily local clearing, which is as at end-1992.

(b) The different giro networks do not apply a uniform distinction between bulk (or retail) payments and wholesale (or large-value) payments, although some systems effectively do so by means of a value threshold (e.g. currently DM 50,000 for urgent large-value credit transfers in the central bank's express electronic intercity credit transfer system (see Section 3.2.1).

The banks usually route urgent large-value payments through their own giro networks via telecommunication, particularly if the receiving bank belongs to the same network. A growing number of large-value transfers initiated by bank customers are processed electronically, either because the customers themselves give their transfer orders by electronic means (magnetic tape, diskette or telecommunication) or because the banks convert their customers' paper-based credit transfers into electronic data records. Telecommunication is increasingly being used for cashless payments between banks instead of the exchange of magnetic tapes.

### *3.1.2 Cashless payments via the Bundesbank*

By providing a giro network which has a neutral impact on competition as a link between the various categories of banks that are engaged in payments, the Bundesbank performs an important regulatory function in the cashless payment system. The range of payment services offered by the central bank ultimately also has an influence on the fees and conditions in the banks' own giro systems and on the development of payment services and the increased use of paperless processing.

In addition to the systems for large-value payments described in greater detail in Section 3.2, the Bundesbank, like the banks, offers two procedures specially designed for the processing of bulk payments. These are:

- OCR document reading (MAOBE), and
- the exchange of data media (DTA).

Both procedures are used for credit transfers and the collection of cheques and direct debits. The first employs optical character recognition (OCR) to read the code lines at the foot of the documents and sort them. The second routes payment data on electronic data media (magnetic tapes, diskettes and cassettes) or via telecommunication. In both cases the processing is centralised in the Bundesbank's computer centres (eight at present), where the documents and data records are sorted according to bank code number (see also Section 1.2.3).

The largest volumes are recorded in the paperless collection of relatively low-value bulk direct debits. In 1992 a total of around 1.6 billion items for a total value of DM 872 billion were processed via the exchange of data media in the Bundesbank's simplified cheque and direct debit collection procedure.

The highest values are registered in the paper-based collection of cheques, which may in some cases be for relatively large unit amounts. In 1992 292 million cheques and direct debits for a total of DM 2,960 billion were processed via OCR document reading in the Bundesbank's simplified cheque and direct debit collection procedure. Credit institutions use these procedures for the collection of cheques and direct debits because the funds are credited to the presenter's giro account "subject to collection" on the working day following the day of presentation (for the simplified cheque and direct debit collection procedure, see also Section 5.2.3).

In 1992 a total of 3,118 million cashless payments for a total value of DM 167,500 billion were channelled through the Bundesbank's payment facilities.

As mentioned above, the banks' own payment networks are also used for large-value transfers. However, Section 3.2 below deals only with those Bundesbank systems which carry particularly large volumes of interbank large-value transfers.

## 3.2 Structure, operation and administration of the Bundesbank's major large-value systems

The Bundesbank currently operates two gross settlement systems for large-value credit transfers, viz. the express electronic intercity credit transfer system (Eil-ZV) (see Section 3.2.1) and the express paper-based local credit transfer system (see Section 3.2.2). Other procedures, also for large-value transfers, are the daily local clearing system (see Section 3.2.3) and the daily electronic clearing with file transfer (EAF)[9] (see Section 3.2.4). The last two are net settlement systems with multilateral clearing.

These four procedures can be classified as large-value transfer systems because, while minimum values are stipulated only for some of the payments processed, the average value of transactions is relatively high. Although large-value transfers are not excluded from the Bundesbank's bulk payment procedures (MAOBE and DTA, see Section 3.1.2), only about 1% of the payments processed are large-value payments; since the average value of transactions over the bulk payment systems is also small, there will be no further discussion of those procedures in this context.

The main features of the Bundesbank's large-value transfer systems are summarised in the following sections.

### *3.2.1 The express electronic intercity credit transfer system (Eiliger Zahlungsverkehr (EIL-ZV))*

#### *(a) General overview*

The Bundesbank's express electronic intercity credit transfer system (EIL-ZV) is used to process credit transfers marked "telegraphic" by the originator (for which there is no minimum value) and large-value credit transfers of currently DM 50,000 or more (so-called express credit transfers) between the central bank's branches.

The system is mainly used by the banks for national and regional interbank transactions, such as money market operations. It is also used for urgent credit transfer orders for bank customers and public authorities, provided these orders are designated as telegraphic or express credit transfers and are delivered to the central bank branch separately from bulk payments.

#### *(b) Major legislation, regulations and policies*

The system is governed by the general provisions of the Civil Code, the Commercial Code and the Act governing General Terms of Business. It is also subject to the general terms of business of the Deutsche Bundesbank and the payment agreements between the banking associations, to which the Bundesbank is generally also a party.

#### *(c) Central bank participation*

The Bundesbank set up the EIL-ZV system in 1987, operates it and is, to that extent, responsible for it. The central bank also participates in the system, executing payments from banks and their customers as well as from public authorities and business enterprises (non-banks) which hold a giro account with one of its branches. Moreover, this system is the most cost-effective and efficient means for the Bundesbank to execute its own transactions.

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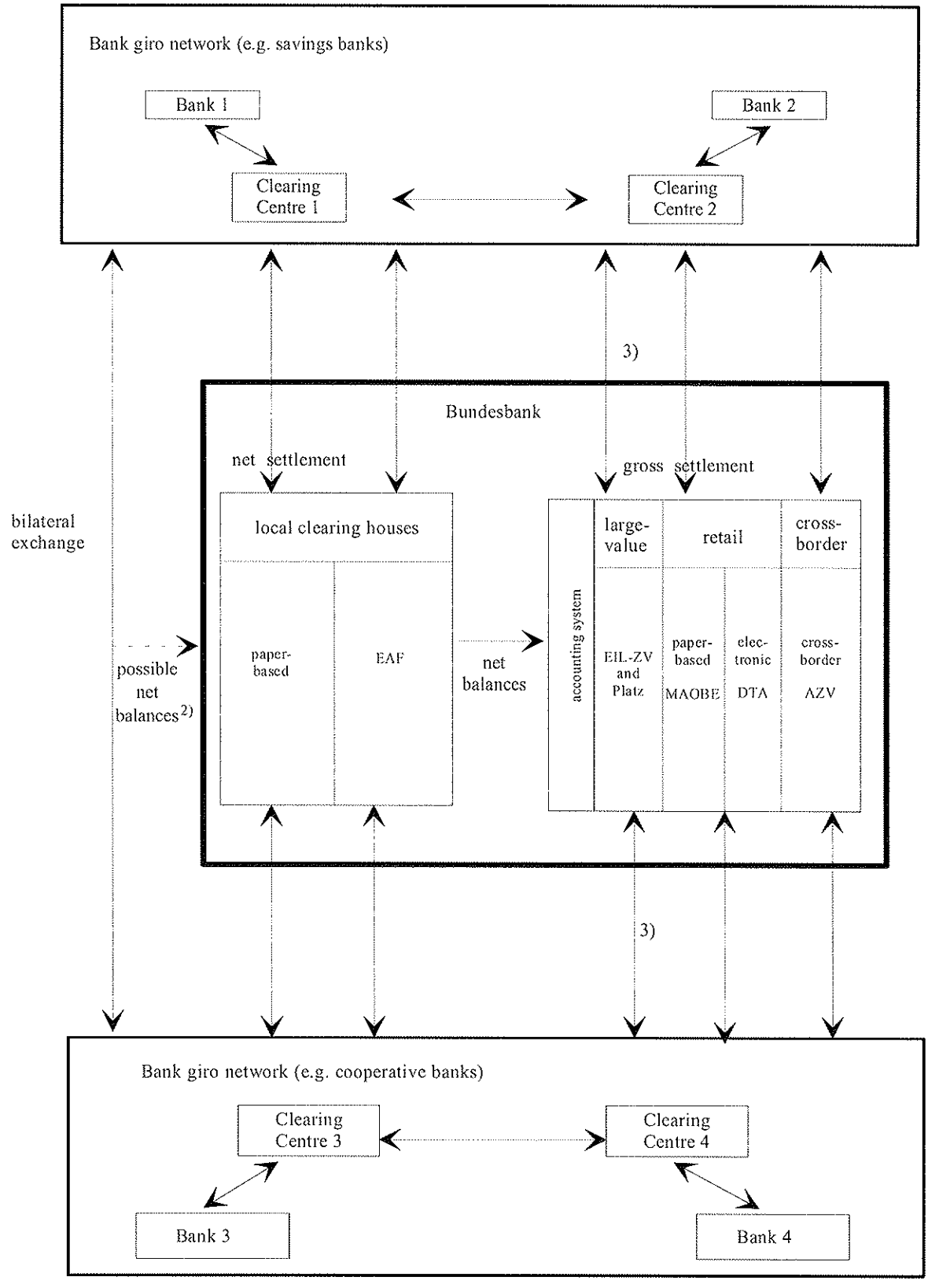
9 *Elektronische Abrechnung mit Filetransfer.*

Chart 2

Interbank funds transfer systems in Germany [1)]




1) For explanation of abbreviations and names, see Annex 1.
2) If not settled through bilateral correspondent accounts.
3) Communication possible through Electronic Counter.

### *(d) Participants*

The participants in the system are all credit institutions with a giro account at a Bundesbank branch, together with the branches and the head office of the Bundesbank itself. The users are therefore all bank customers (e.g. private individuals, business enterprises, public authorities) which hold their accounts at a credit institution or a Bundesbank office. Account holders at the Bundesbank's head office chiefly comprise foreign central banks and correspondent banks.

### *(e) Operation of the system*

Paper-based credit transfer orders which meet certain requirements (e.g. the guidelines for standard payment forms) can be presented for processing in the EIL-ZV system. Since January 1992, as part of a programme to broaden electronic access, the Bundesbank has also provided the Electronic Counter,[10] via which telegraphic transfers and express credit transfers can be accepted and delivered electronically (for further details see Section 5.2.3). The format and data record structure of the files presented and delivered electronically follow very largely the procedures agreed between the banking associations (e.g. DTA).

For both types of payment in the EIL-ZV system (telegraphic and express credit transfers) there is a technical ceiling of DM 999,999,999.99 per payment. Compliance with the minimum value for express credit transfers (DM 50,000, effective from October 1993 until further notice)[11] is monitored by the system. Cut-off time for the presentation of paper-based payment orders at a Bundesbank branch is 12 noon, and for the presentation of orders via the Electronic Counter currently 1.30 p.m. After the cut-off time, orders are accepted and executed in the EIL-ZV system on payment of a special late charge until the close of the Electronic Counter, currently 2.30 p.m.

The Electronic Counter at Bundesbank branches is designed to enable all holders of giro accounts at a given Bundesbank branch to issue payment orders for the EIL-ZV and also to receive payments electronically, via telecommunication or via data media (diskettes). Payments can be exchanged between all holders of giro accounts at the Bundesbank, irrespective of whether they participate in the Electronic Counter.

In August 1993 a routing selection procedure (the *Leitwegsteuerung*) was introduced for payment orders submitted via the Electronic Counter. This enables banks, as part of their cash management, to route credit transfers not according to the receiving bank's code number but to a clearing institution (e.g. a bank's main branch or a central institution in the case of the savings banks and cooperative banks). All automated payment procedures of the Bundesbank incorporate this facility.

In the telecommunication procedure the connection between the participants and the account-keeping Bundesbank branch is based on the public Datex-P network. Participants submit their payment exchange data via file transfer. The branch likewise transmits data files to the recipients at specified intervals, currently twenty minutes for telegraphic transfers. The data, whether sent by telecommunication or on diskette, are protected from manipulation during transmission by a special authentication procedure. In the data media procedure the Bundesbank branch delivers the prepared data files on diskette. For account holders who do not participate in the Electronic Counter the Bundesbank delivers credit slips.

There are no volume limits on the submission of data media and paper-based telegraphic transfers, although the rules on data file size and, in the case of data media, the number of data files

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10 *Elektronischer Schalter.*

11 In order to ensure the smooth functioning of the system against the background of increasing capacity utilisation, the Bundesbank has raised the minimum value for express credit transfers from DM 10,000 to DM 50,000 until further notice.

apply. In the event of a failure of the telecommunication link between the customer's processing system and that of the Bundesbank branch, data files can be submitted and delivered on data media or on paper. The largest Bundesbank branches are equipped with an additional backup computer and all branches have alternative facilities for encryption by personal computer.

Where it is itself the first bank to receive the payment instruction, the Bundesbank meets the EZÜ requirement - which since January 1992 has made it obligatory to convert paper-based intercity credit transfers for DM 10,000 or more into data records - by data capture and paperless execution of such payments in the EIL-ZV system. Where the credit institutions are required to undertake the conversion, the Bundesbank insists that express credit transfers be submitted in paperless form via the Electronic Counter; in the case of paper-based telegraphic transfers it is willing to make the conversion itself for a small charge.

The Bundesbank currently charges DM 0.01 per intercity transfer (DM 0.30 per item with effect from 1st January 1994) via the EIL-ZV system. Telegraphic transfers, which are always executed the same day, even in the event of transmission channel failure, cost DM 20 (DM 10 with effect from 1st January 1994), plus DM 2 for conversion if the order is not submitted in paperless form via the Electronic Counter. In addition, participants using telecommunications incur the Datex-P fees charged by the Deutsche Bundespost for data transmission to and from the Bundesbank's gateway system. In 1992 1.9 million telegraphic transfers for a total value of DM 13,349 billion and 0.8 million express credit transfers for DM 262 billion were executed via the Bundesbank's EIL-ZV system.

#### *(f) Settlement and finality*

In accordance with the Bundesbank Act credit transfers are executed only if there is sufficient cover, the originator's giro account being debited before the payment is routed (cover principle, see Section 5.2.4). Orders for which there is insufficient cover remain in a system queue at the central bank branch to which they have been submitted until receipt of cover. There is no centralised system for exchanging payments; payments are routed and settled directly between Bundesbank branches.

The receiving Bundesbank branch (payee's branch) credits the payee's giro account only when it has received the electronic message from the sending Bundesbank branch (payer's branch). Credit transfers are credited to the beneficiary's account on the day the transfer is received at the payee's branch. In the EIL-ZV system the Bundesbank executes (at extra charge) orders for telegraphic transfer value the same day and with simultaneous notice of credit. However, same-day execution cannot be guaranteed for the much cheaper express credit transfers, particularly in the event of technical failure.

Credit transfers are effective only when the account-keeping Bundesbank office has credited the funds to the beneficiary's giro account. Since each credit transfer order is executed only upon receipt of cover, settlement failures or unwinding cannot occur. Given these arrangements, in the EIL-ZV system - a gross settlement system - the central bank is not exposed to credit or liquidity risk. Nor is the receiving bank, since it can make the funds received available to the ultimate recipient unconditionally.

### *3.2.2 The express paper-based local credit transfer system (Platzüberweisungsverkehr)*

#### *(a) General overview*

The Bundesbank's express paper-based local credit transfer system currently provides same-day processing and settlement of paper-based credit transfer orders for payments within the same locality. It is used principally because paper items input into the central bank's automated bulk

payment system are processed via the computer centres and so are not settled on the same day.[12] The credit institutions use this system, in which there are no value restrictions, for interbank payments (e.g. money market transactions) and, like the central bank, for executing payment orders received from customers. As regards legislation in force, central bank participation, participants and settlement and finality the same principles apply mutatis mutandis as those governing the EIL-ZV system summarised in Section 3.2.1.

#### *(b) Operation of the system*

The system is based on the traditional manual execution of paper-based credit transfers by transfer of funds between giro accounts held at the same branch of the central bank. The cover principle also applies in this gross settlement system, i.e. the originator's account is debited before the funds are credited to the beneficiary's account (or debit and credit occur simultaneously in the books of the central bank branch).

In 1992 72.1 million transactions for a total of DM 8,684 billion were carried out using the central bank's express paper-based local credit transfer system, representing 2.3% by volume and 5.2% by value of all cashless payments executed through the Bundesbank. Express paper-based local credit transfers are currently processed free of charge.

The express local credit transfer system was originally a purely paper-based payment system. However, since August 1992 Bundesbank account holders have been able to submit and receive express local credit transfers electronically also via the Electronic Counter.

### *3.2.3 The daily local clearing system (Abrechnung)*

#### *(a) General overview*

The function of the clearing offices established at the central bank's branches is to facilitate settlement of payments between the participating credit institutions in the area served by each branch. Using the (paper-based) daily local clearing system participants can exchange and settle with one another credit items (e.g. credit transfers) and items for collection (e.g. cheques, direct debits or bills of exchange). The clearing offices process not individual payments but only batches of payments (documents or data media) previously sorted by the presenting banks, on the basis of which they calculate a single net position for each participant. Unlike the express electronic intercity and local credit transfer systems, which are both gross settlement systems, and the central bank's bulk payment systems, the daily local clearing system is a multilateral net settlement system. In major financial centres, notably in Frankfurt, large payments resulting from interbank money market and foreign exchange market transactions are cleared through this system, although it is also used for banks' customer payments. In addition to the paper-based daily local clearing system, since March 1990 the credit institutions have been able to use the EAF electronic clearing system for paperless credit transfers based in Frankfurt (see Section 3.2.4).

The central bank's clearing offices and the EAF link the various bank giro systems by means of an exchange, clearing and settlement facility for banks in the same centre. The daily local clearing system also supplements the central bank's express paper-based local credit transfer system (see Section 3.2.2), in which, unlike in the net settlement system, payers have to provide cover before each individual order can be executed and payees then receive the funds without delay and unconditionally.

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12 The normal execution times in the Bundesbank's MAOBE and DTA procedures are one or two working days (see Section 1.4).

### *(b) Major legislation, regulations and policies*

The major statutory provisions which provide the framework for the daily local clearing system are contained in the Civil Code, the Commercial Code, the Banking Act and, particularly as regards presentation for payment, the Bills of Exchange Act and the Cheques Act. The system is also governed by the general terms of business of the Bundesbank and the terms of business of the clearing office. The last-mentioned were issued by the Bundesbank after consultation with the banking industry and constitute the specific terms of business regulating the detailed operation of the daily local clearing system, the legal relationship between the participants and the clearing office and between participants, and the conditions for and consequences of exclusion from the system.

### *(c) Central bank participation*

The Bundesbank, as operator of the system, makes its facilities available to the clearing participants, makes possible the exchange of clearing items, calculates the net positions and books them on the giro accounts held with it. At the same time the central bank itself participates in the system.

The Bundesbank determines the procedure followed by the clearing offices by laying down the terms of business after policy consultation with the banking industry. It operates the clearing offices on its own premises and supervises the clearing process in its capacity as system operator and by virtue of its responsibility for the operation of the payment system as a whole. At the end of 1992 the central bank had established clearing offices at 174 of its existing 190 branches. With only a few exceptions there are no exchange or clearing and settlement facilities between the various local clearing offices.

### *(d) Participants*

Credit institutions with a giro account at the Bundesbank branch performing the clearing can participate in the daily local clearing system. The clearing offices' terms of business also make provision for an associate status for institutions which do not participate directly in the clearing; items for such institutions can be routed via a direct clearing participant. In practice, however, this is of minor significance. At the end of 1992, 1,609 credit institutions participated in the clearing.

### *(e) Operation of the system*

Each participant sorts the clearing items for each of the other participants into delivery folders (items for collection and credit items in separate folders), and presents them for clearing by the delivery deadlines specified in the general terms of business (normally several deadlines between 8.15 a.m. and 1 p.m.). The clearing office prepares delivery lists of the clearing items which have been presented, grouped by receiving bank according to the details on the delivery folders (items for collection and credit items separately). The participants are required to collect the clearing items prepared for them from the clearing office at the delivery deadlines or at the clearing cut-off time. The latter is fixed and is normally 1 p.m. The net position for each participant at that time is calculated after the clearing cut-off time by the clearing office (i.e. Bundesbank staff). Each participant receives an itemised list showing the items submitted and received and its net position.

The majority of payments presented for clearing are stored on magnetic tape and are processed via the exchange of data media between the banks on a bilateral basis so that in the clearing procedure only the total indicated on the delivery folders is settled. In some cases large-value payments are also presented in the form of paper-based credit transfers for processing in the daily local clearing system.

In the daily local clearing system there are currently no volume or value limits on transactions. The Bundesbank at present provides its clearing office services to participants free of charge.

#### *(f) Settlement and finality*

The clearing office books the net positions calculated at the clearing cut-off time for settlement on the giro accounts held by the clearing participants at the Bundesbank branch. Once the net positions have been booked on the giro accounts, the clearing participants are notified by fax or telecommunication of the completion of the clearing (positive report).

The daily local clearing is carried out subject to the ability of participants to fulfil payment obligations arising from the clearing vis-à-vis the Bundesbank branch as clearing office. According to the terms of business of the clearing office, each participant is responsible for timely provision of cover on its giro account for a debit position arising in the clearing (cover principle, see Section 5.2.4). If the participant fails to provide cover, the terms of business provide for exclusion from participation in the clearing system from the day of the clearing in question.

The terms of business of the clearing office stipulate that the clearing participants are merely custodians of the clearing items delivered to them until the net positions have been booked. This means that the funds in respect of the credit items delivered to the participants and the items for collection presented by them are - without prejudice to their obligation to take back unpaid collection items within a certain period - only finally available to them on settlement. The clearing participants are accordingly exposed to risk if they credit their customers' accounts before settlement has been completed and thus final funds are available. If in expectation of completion of the clearing the credit institutions allow their customers to draw on the funds beforehand, they are in effect granting short-term loans for the duration of the clearing process, which should be monitored according to their own criteria. Credit transfers in the daily local clearing system cannot be reversed. After the clearing cut-off time the participants can have no further influence on the net positions.

If a clearing office finds that there is insufficient cover for a participant's debit position, the latter is requested to remit cover within a specified period of time. The participant will obtain funds on the money market and can transmit payment to its giro account via the central bank's express electronic intercity credit transfer system (see Section 3.2.1) or express local credit transfer system (see Section 3.2.2).

Under the terms of business of the clearing office, if a participant fails to provide cover the clearing office will recalculate the net positions excluding the defaulting participant and all payments to and from that participant. This unwinding of the clearing in the event of a participant's default, with the further exclusions it may trigger (the domino effect), constitutes the systemic risk inherent in the current clearing procedure.

### *3.2.4 The daily electronic clearing with file transfer (Elektronische Abrechnung mit Filetransfer (EAF))*

#### *(a) General overview*

The first step in the Bundesbank's programme to provide electronic facilities for the acceptance, transmission and delivery of electronic payment orders outside the bulk payment procedures was the introduction of a new payment system, the daily electronic clearing with file transfer (EAF), in Frankfurt in 1990. The EAF is used for the paperless exchange of credit transfers in Deutsche Mark between participants by telecommunication. Payment items exchanged between participants are executed upon settlement of the daily electronic clearing. In the EAF credit transfers can be presented either in DTA format (for amounts of DM 10,000 or more) or in S.W.I.F.T. format in the case of S.W.I.F.T. payments received from abroad (without value limit). The EAF procedure

has simplified the clearing of large-value credit transfers and at the same time accelerated the transmission of information. All credit institutions with a branch in Frankfurt and a giro account at the Bundesbank's branch in Frankfurt can participate in the EAF. The EAF is operated by the Bundesbank's branch in Frankfurt only. The system is used primarily for same-day clearing and settlement of interbank payments (e.g. money market transactions) but also for the execution of credit transfer orders received from bank customers.

### *(b) Major legislation, regulations and policies*

The principles of the EAF are similar to those of the paper-based daily local clearing system which is operated locally at almost all Bundesbank branches. The EAF is also governed by the same general statutory provisions, in particular the Civil Code, the Commercial Code and the Banking Act. In addition, the participants are subject to special terms of business for the daily electronic clearing and supplementary regulations contained in a user handbook.

The daily electronic clearing and the (paper-based) daily local clearing in Frankfurt are legally independent systems with separate calculation of net positions.

### *(c) Central bank participation*

As with the daily local clearing system, the Bundesbank provides the EAF as a special service within the framework of its statutory responsibility for the operation of the payment system. Its current aim is to eliminate or reduce the risks associated with the paper-based and electronic clearing procedures. The central bank is itself a participant in the EAF through its head office.

### *(d) Participants*

Credit institutions with a branch in Frankfurt, the necessary technical facilities for data telecommunication and a giro account at the Bundesbank's branch in Frankfurt can participate in the EAF. Credit institutions which do not satisfy these criteria can receive payments as associates of direct participants without participating in the electronic clearing themselves; payments for them are routed via the respective direct participants and settled across their giro accounts. In practice, indirect participation with associate status is of no importance. In early 1993 forty credit institutions were participants in the EAF in Frankfurt.

### *(e) Operation of the system*

From a technical point of view, the Bundesbank's programme to broaden electronic access, and hence the EAF, are designed so as to provide a standardised technical communications interface for payments traffic based on non-proprietary, internationally standardised protocols (ISO/OSI FTAM protocol), thereby taking account of the variety of computing systems in operation at the participating institutions. Communication with giro account holders takes place via an interface on dedicated gateway systems of the Bundesbank. Payments data then proceed from the gateway systems through the Bundesbank's internal network to the respective processing systems, in the case of the EAF the computer centre of the Hesse Land Central Bank.[13] The security requirements (protection against unauthorised access and manipulation, identification of sender and integrity of data) are met, inter alia, through the use of dynamic passwords and encryption keys for all communication links. The link between the clearing participants and the Bundesbank is based on the public Datex-P network. As an alternative procedure for contingencies, provision is made in the EAF for transporting data between the participants and the Bundesbank on magnetic tape or cassettes.

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13 The Bundesbank as a legal entity comprises the Central Office (in Frankfurt am Main) and nine Land Central Banks *(Landeszentralbanken)* as well as 188 branches (as at the end of 1993).

At present EAF payments can normally be submitted to the Bundesbank's branch in Frankfurt continuously between 8 a.m. and 12.30 p.m. There the payment exchange records are processed on the basis of the details in the record header. The Bundesbank delivers the payment exchange records, re-sorted according to receiving bank and re-batched as files, at regular intervals of around twenty minutes, transmitting the running balance with each delivery. The file transfer must be concluded by the clearing cut-off time so as to ensure the EAF is completed on time.

Continuous input and delivery at short intervals meets the EAF objective of notifying receiving banks of incoming payments earlier than is possible in the paper-based daily local clearing system. It also makes it possible to achieve settlement finality in the EAF earlier than in the daily local clearing system. Participants receive a positive report of the completion of the clearing.

A credit transfer in the EAF currently costs the originator DM 0.01 for the data record (DM 0.30 with effect from 1st January 1994). Participants in the EAF also have to bear the costs of their own data-processing systems and the charges for data transmission to and from the Bundesbank.

### *(f) Settlement and finality*

The principles underlying the settlement and finality of payments in the EAF are similar to the procedure in the (paper-based) daily local clearing system. The Bundesbank nets the amounts owed by a participant for credit transfers submitted against the amounts due in respect of payments delivered. Participants' net positions at the clearing cut-off time are booked on their giro accounts at the Bundesbank in settlement of the clearing. The electronic clearing is also carried out subject to the ability of participants to fulfil payment obligations arising from the clearing vis-à-vis the Bundesbank branch. After the clearing cut-off time the participants can have no further influence on the net positions. The Bundesbank branch notifies the participants of the completion of the EAF by telecommunication. Funds in respect of the payments exchanged are only finally available to the participants on settlement of the clearing. Crediting of funds to customers before settlement is at participants' own risk.

If a net position is negative, the Bundesbank branch blocks the credit balance on the participant's giro account for that amount until its clearing obligations have been settled. In case of insufficient cover, the participant is notified by the Bundesbank and must provide the necessary cover on its giro account.

If a participant fails to provide the cover required to book its debit position on its giro account, under the terms of business the electronic clearing cannot be completed. The participants are notified of this by the Bundesbank. Under the clearing rules, the defaulting participant is excluded from the electronic clearing and the net positions are recalculated without the payments to and from that institution. As in the (paper-based) daily local clearing system, this possibility of unwinding the EAF constitutes the systemic risk inherent in the current clearing procedure.

### *(g) Further development of the EAF*

The limitation of systemic risk is the subject of ongoing discussions between the Bundesbank and the banking sector. In this context, interest has focused on two issues: increases in collateral and the further development of the EAF.

The broad concept designed by the Bundesbank for the new "EAF2" is aimed at reaching early and intraday finality of individual payments, as is typical for real-time gross settlement systems.

The Bundesbank will decide on the possible implementation of the new system in the near future.

### 3.3 Future developments

The following medium and long-term developments in cashless payment systems are foreseeable at present:

- A further decline in paper-based payments in favour of paperless payments: the introduction by the banking associations of new or modified payments agreements will contribute to this process. In this connection, mention should be made in particular of the following measures: the introduction of a requirement to convert paper-based direct debits into data records irrespective of value (the EZL[14] requirement, which has been effective since November 1993) and the lowering of the threshold for compulsory conversion of paper-based credit transfers to DM 1,000, which will be introduced in September 1994.
- A further increase in the use of telecommunication in place of the physical exchange of data media in cashless payment transactions:
  - more widespread use of telecommunication both within and between the banks' payment networks, a process in which the central bank will play an important intermediary role through its electronic access policy (see Section 5.5);
  - strengthening of ties between customers and their banks by means of cash management systems, PCs with videotex capability and computer-to-computer links for the secure transmission of data files.
- Harmonisation of electronic payment systems: over the next few years the efforts of the banking industry will be focused primarily on rationalising cashless payments within the European internal market. As part of the process of European integration new standards could become necessary for electronic payment systems in addition to S.W.I.F.T. Developments by businesses (bank customers) towards integrating payment messages in their other electronic traffic (e.g. EDIFACT) will probably also entail modifications to the payment system. Overall, while competition among banks will continue, a minimum of concerted action will be necessary in the area of methods, standards and technology.

## 4. SPECIAL USE OF INTERBANK TRANSFER SYSTEMS FOR INTERNATIONAL AND DOMESTIC FINANCIAL TRANSACTIONS

### 4.1 Exchange and settlement systems for international transactions

#### *4.1.1 General overview; role of the Bundesbank*

There are no government restrictions on international movements of money and capital in Germany. However, the existing legislation on foreign trade and payments requires that for statistical purposes incoming or outgoing payments to or from residents (or for the account of residents) must be reported to the central bank. Certain payments (e.g. payments up to DM 5,000) are exempt from this reporting requirement.

In Germany international payments are handled mainly by the credit institutions. The Postbank, the Bundesbank and, to a lesser extent, the credit card companies are also involved in international payments.

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14 *Elektronischer Zahlungsverkehr Lastschrift.*

The arrangements for processing international payments currently differ from those for domestic payments in the following respects. There is no bank network for cross-border payments of the kind that exists for domestic transactions in Germany, as - with the exception of individual banking groups which cooperate internationally - the domestic giro networks in different countries are not interconnected across national borders. Over the years the credit institutions have therefore established a worldwide network of correspondent banks. This network is supplemented by 146 foreign branches of forty-four German credit institutions in all major financial centres (as at end-1992) as well as 217 subsidiaries of German credit institutions abroad (as at end-1991). Since 1977 German banks have been able to route cross-border payment orders via S.W.I.F.T. (see Chapter 12).

Although the Bundesbank, under Article 3 of the Deutsche Bundesbank Act, is responsible for ensuring the execution by banks of international as well as domestic payments, it does not currently play a central role in this; it leaves it to the banks to handle international commercial payments and only acts on behalf of institutions that have no facilities for carrying out such payments themselves. In order to fulfil this role (e.g. to execute cross-border payments as fiscal agent of the Federal Government), at the end of 1991 the Bundesbank had a network of 298 correspondent banks (of which 224 were S.W.I.F.T. users) in 103 countries (forty-eight of which were S.W.I.F.T. member countries) and maintained accounts with fifteen international banks and organisations.

In Germany it is not yet standard practice for international payments to be divided strictly between bulk or small-value payments and large-value payments. However, since 1992 there have been new developments in this connection in the light of the EC internal market.

### *4.1.2 Payment instruments available to bank customers for international payments*

#### *(a) Cash payments*

Cash payments in foreign currency (foreign banknotes and coin) are confined almost entirely to private and business travel.

#### *(b) Credit transfers*

The credit transfer is the main instrument used for international payments in Germany. Only fragmentary statistics are available on the relative share of the channels German banks use for cross-border payments, but it is estimated that 85% of all such payments take the form of credit transfers, of which between 70 and 80% are effected with correspondent banks on a paperless basis via the S.W.I.F.T. system. In 1992 German credit institutions used S.W.I.F.T. for around 33 million messages (8.1% of the global S.W.I.F.T. traffic). In that year the 228 German institutions connected to the S.W.I.F.T. network (of which 152 were member banks) sent 5.5 million customer transfers in the form of S.W.I.F.T. messages, 3.7 million of which were directed to other EU countries; on the basis of past experience, the number of incoming payments from abroad is around 160% of the volume originating in Germany.

#### *(c) Cheques*

The use of personal cheques has increased considerably in recent years, a development which in Germany is attributable largely to the eurocheque system. In Germany the eurocheque is a retail payment instrument. In 1992, of the 51.7 million eurocheque cards issued, Germany accounted for 33.7 million. In the same year the *Gesellschaft für Zahlungssysteme* processed 30 million international eurocheque transactions in local currency, for a total value equivalent to DM 8.6 billion. The value of transactions abroad by German eurocheque cardholders was DM 7.4 billion, including 5.6 million withdrawals from cash dispensers totalling DM 1.4 billion. Withdrawals by foreign eurocheque cardholders from cash dispensers in Germany amounted to DM 238 million. In addition,

4.3 million eurocheques for around DM 1 billion were issued in Germany by customers of foreign banks.

#### *(d) Credit cards*

The use of credit cards for payments abroad has grown in line with the general increase in their importance in Germany (see Section 2.2.3). ***Travellers' cheques***, on the other hand, are gradually declining in importance as a result of the increasing use of eurocheques and credit cards as international payment instruments.

#### *(e) Statistics on international payments*

In contrast to domestic payments, no systematic statistics are currently available on international payments and the relative importance of the various payment instruments. It is estimated that bank customers' payments to other EC countries (credit transfers and cheques, but excluding eurocheques and postal giro payments) are equivalent to just under 0.2% of the volume of domestic payments.

German residents spent DM 48 billion abroad on foreign travel in 1990. The receipts of the German tourist trade from foreign visitors amounted to DM 17 billion in the same year. The relative importance of the various payment instruments has shifted over the years, away from cash. In 1990 the estimated share of each payment instrument in foreign travel expenditure (receipts) was as follows: cash 50% (53%), credit cards 12% (19%), eurocheques 15% (9%), travellers' cheques 7% (16%) and bank transfers 17% (3%).

### *4.1.3 International large-value payments*

International large-value credit transfers are generally also effected in paperless form via the S.W.I.F.T. system. In addition, banks operating internationally may use their own networks, branches abroad or correspondent banks.

Since no distinction is in principle made between small and large-value payments, the domestic clearing systems in Germany are also used for the international settlement of large-value payments in Deutsche Mark (see Section 3.2). For example, the high turnover of the Frankfurt clearing (97% of the total clearing turnover at Bundesbank branches) is mainly due to the fact that banks in Frankfurt channel a large proportion of their money market and foreign exchange transactions through the Bundesbank's clearing procedures.

The EAF at the Bundesbank in Frankfurt (see Sections 3.2.4 and 5.2.2) is already used to process incoming S.W.I.F.T. payments without value restrictions. It is planned that at a later stage in the development of the Bundesbank's Electronic Counter it will be possible to issue international payment instructions and deliver incoming payments from abroad electronically (see Section 5.5).

## *4.2 Exchange and settlement systems for securities transactions*

### *4.2.1 System of central depositories*

Book-entry securities transfers are carried out by *Deutscher Kassenverein AG (DKV)*,[15] a body jointly owned by the German banking industry. The DKV has branches in the following cities with stock exchanges: Berlin, Dusseldorf, Frankfurt (the main branch), Hamburg, Hanover, Munich and Stuttgart. The DKV is a wholly-owned subsidiary of *Deutsche Börse AG*, 70% of whose capital

15 The German securities depository.

is held by German banks and 10% each by foreign banks, brokers and *Deutsche Börsen Beteiligungs GmbH*. Only credit institutions which are subject to the statutory audit of deposited securities or comparable audits and securities trading firms that meet special requirements may become account holders. For all practical purposes, all banks active in the business of securities trading and custody hold accounts with the DKV.

The DKV is a specialised bank with a limited range of business and is subject to official supervision by the Federal Banking Supervisory Office. It is the central custodian for securities held in giro-transferable collective custody and the central agency for the securities transfer system. Roughly 80% (by value) of all securities in Germany are held in custody by the DKV.

### *4.2.2 Centralised stock exchange transaction processing system*

The *Deutsche Wertpapierdaten-Zentrale (DWZ)*, a wholly-owned subsidiary of the DKV, provides automated data processing for the whole of the German stock exchange and central securities depository system. Stockbrokers and banks can enter their securities transactions for electronic data processing via terminals. Every working day the EDP system (trading floor and IBIS (an electronic integrated stock exchange trading and information system)) issues contract notes or delivery lists in respect of stock exchange transactions and over-the-counter direct transactions between banks which are also entered in the centralised stock exchange transaction processing system (see Section 4.2.3). Contract notes issued in respect of floor trades have to be checked by the counterparties. Errors must be reported before the start of the next trading session. If the contents of contract notes are not disputed within the set time-limits, the underlying transaction is considered to have been firmly accepted. Thus, there is no provision for confirmation between counterparties. According to established stock exchange practice all transactions must be settled on the second trading day following the date of the trade.

### *4.2.3 Individual orders*

Securities transactions are executed only after the data entered into the DWZ computer by the counterparties have been matched by the system.

Since the beginning of 1992 it has been possible to submit orders for same-day settlement if they are matched before 10 a.m.

It is difficult to estimate the scale of over-the-counter (OTC) activity. Trading before and after the official sessions in officially listed or unlisted securities amounts to around 30% of turnover in shares and around 90% of that in bonds. OTC trading in shares has declined in relative terms since these transactions were integrated in the IBIS electronic stock exchange trading system.

### *4.2.4 Delivery versus payment*

Stock exchange transactions are recorded by the DKV only on a simultaneous basis, i.e. the cash and securities entries made on internal clearing accounts held at the DKV are effective at the same time. (Although for technical reasons the book entries are made in advance, they are legally effective only when securities account statements have been delivered to the DKV's customers. The cash accounts are settled at the same time via the DKV branch accounts held with the Land Central Banks.) Securities transfers arising from individual OTC trades are also executed with simultaneous payment.

In 1992 approximately 16.5 million securities transfers were effected against payment totalling DM 4,663.5 billion (only one side of the trade counted). This is equivalent to a daily transaction value of approximately DM 18-19 billion. In addition, about 6 million securities transfers were executed free of payment through the DKV.

#### *4.2.5 Transfer of ownership of securities*

Ownership of securities is transferred by physical delivery (in 1992 approximately 1.3 million transfers) or by book-entry transfer of shares in collective holdings (in 1992 approximately 21.3 million transfers). Book-entry transfers, like payment transactions, are executed on a local or an intercity basis depending on the location of the depository branches involved. The DKV's branches have accounts with one another and are interconnected by telecommunication. According to the DKV's terms of business, ownership[16] of shares in the collective holding is transferred when the securities account statement has been sent or delivered to the account holder. As a rule this is done after completion of cash settlement via the Bundesbank branch, once it has been established that there is cover for all amounts due.

The DKV does not carry out securities netting. Securities transfers take place on a trade-by-trade basis. It is therefore unnecessary to set up a special guarantee fund.

#### *4.2.6 Cash settlement*

The debit or credit cash position arising out of all trades on each account holder's internal DKV cash account is established and settled on the performance date over its giro account at the Bundesbank branch. For this purpose the DKV presents a daily list of the credit and debit positions of all clearing participants to the Bundesbank. Settlement is only carried out in Deutsche Mark.

Cash settlement generally takes place the day after delivery of securities transfer orders or delivery lists to the DKV (i.e. two trading days after a stock exchange transaction). Individual orders can also be settled on the day the transfer order is submitted. The funds due must be available at 11 a.m. on settlement day on the participant's giro account at the Bundesbank branch. In the nationwide cash settlement of intercity stock exchange transactions, cash positions are settled by DKV branches by telegraphic transfer via their Bundesbank accounts.

## 5. THE ROLE OF THE CENTRAL BANK IN INTERBANK SETTLEMENT SYSTEMS

### 5.1 Statutory responsibilities

Under Article 3 of the Deutsche Bundesbank Act, the Bundesbank is required to provide for the execution by banks of domestic and external payments. It fulfils this obligation primarily by providing the competing institutions of the various banking categories with a giro network that has no impact on competition. Under the Bundesbank Act, the Bundesbank may execute payment orders only if cover is available; it may grant credit to banks only in the form of lombard loans (against pledging of securities) under the lombard giro overdraft facility (see Section 5.2.4). The Bundesbank Act also sets out the monetary policy powers conferred on the central bank (e.g. the minimum reserve policy, see Section 5.3).

16 In most cases, it is co-ownership of collective holdings.

## 5.2 Provision of settlement facilities

### *5.2.1 Giro accounts*

The Bundesbank's clearing facilities are available on equal terms to all credit institutions actively involved in the payment system. In order to use the Bundesbank's giro system and its cashless payment services, credit institutions must open giro accounts in its books. The central bank holds giro accounts for credit institutions and public authorities and, by way of exception only, for business enterprises (non-banks) and individuals. These non-interest-bearing accounts must always remain in credit. At the end of 1992 credit institutions held a total of 5,703 giro accounts with the central bank.

### *5.2.2 Local payments*

Credit institutions in centres where the Bundesbank has a branch are able to exchange cheques, direct debits and other claims as well as credit transfers in the daily local clearing system (see Section 3.2.3). In addition to this paper-based clearing, the daily electronic clearing with file transfer (EAF) has been operating in Frankfurt since March 1990 (see Section 3.2.4).

Besides these net systems, account holders at all Bundesbank branches can use the express local credit transfer system for credit transfers to another account at the same branch. This is a gross settlement system without value limit in which credit transfer orders are executed item by item, provided sufficient cover is available (see Section 3.2.2).

Of all the cashless payments passing through the Bundesbank in 1992 (see Section 3.1.2), 462 million payments (15%) for a total of DM 147,651 billion (88%) were local payments. Express local credit transfers accounted for 2% of all cashless payments processed via the Bundesbank in volume terms and 5% in value terms and local clearing traffic for 13% and 83% respectively.

The Bundesbank's (paper-based) daily local clearing system handled a total of 381 million payments (credit transfers, cheques and other collection items) for DM 55,377 billion in 1992. In addition, in 1992 7.8 million payments for a total of DM 83,023 billion were exchanged via the EAF in Frankfurt (forty participating banks at the beginning of 1993). This represented 2% of all payments cleared by the Bundesbank and 60% of the total value.

### *5.2.3 Intercity payments*

Every credit institution in Germany can be reached via the central bank's giro network. In the intercity credit transfer system (bulk) payments in paper or paperless form (recorded on magnetic tape or diskette) and, in the express electronic system, telegraphic or express credit transfers (currently for DM 50,000 or more) can be exchanged between different centres. The banks can use the Bundesbank's simplified cheque and direct debit collection procedure to collect cheques and both paper-based and paperless direct debits drawn on any place in Germany.

In 1992 the Bundesbank's intercity payment system was used for 2.7 billion payments, of which 0.4 billion were credit transfers for a total of DM 14,991 billion and 1.9 billion were cheques and direct debits for a total of DM 4,035 billion. In the simplified cheque and direct debit collection system the Bundesbank collects Deutsche Mark cheques, payments stemming from the cheque truncation procedure and direct debits drawn on any place in Germany for credit institutions holding a giro account with it. The funds are credited to the presenter's giro account "subject to collection" on the working day following the day of presentation. Only 0.1% of all items sent for collection via the central bank's payment network are not processed by machine. Of the 292 million paper-based cheques and direct debits presented for automated collection in 1992, 77 million cheques

were converted into data records by the Bundesbank (cheque truncation procedure, see Section 2.2.2 (b)).

85% of intercity payments undergo automated processing at the Bundesbank's computer centres (of which there are currently eight), where they are recorded, reconciled, sorted and grouped according to various criteria for delivery, booking and statistical purposes. In order to speed up the intercity payments routed via its computer centres, in recent years the Bundesbank has linked the centres together by a telecommunication network, over which paperless credit transfers without value limit and direct debits for DM 1,000 or more are transmitted. As a result, the execution time in the Bundesbank's network for intercity payments via the exchange of data media has been reduced by one day to a maximum of twenty-four hours.

There is also a telecommunication network between the Bundesbank's branches for the rapid processing of large-value payments in the central bank's express electronic intercity credit transfer system; it is used to execute telegraphic transfers on the same day and express credit transfers (at present for DM 50,000 or more) usually on the same day (see Section 3.2.1).

In January 1992 the Bundesbank extended its service by introducing the Electronic Counter as a new means of accessing its express electronic intercity credit transfer system. It enables payments to be received electronically, forwarded via the central bank's internal telecommunication network and delivered electronically. Participation in the Electronic Counter is open to all giro account holders with the necessary technical facilities for data telecommunication. Giro account holders without data telecommunication equipment can submit and receive payments at the Electronic Counter on diskette. This practical implementation of the principle of once-for-all capture and multiple use of data has resulted in more efficient processing of payments and shorter execution times for all participants. As at mid-1992 there were eighty-three giro account holders participating in the Electronic Counter via diskette and fifty-nine via data telecommunication at a total of fifty-nine Bundesbank branches.

The Electronic Counter, together with the EAF, is part of the Bundesbank's programme for broadening electronic access to its services. The applications use the standards established for the payment system (DTA and S.W.I.F.T. formats).

As in the case of local credit transfers, the Bundesbank executes intercity credit transfer instructions only after cover has been provided. The Bundesbank is thus not exposed to risk and the payee has final and unconditional disposal of incoming funds once they have been credited to his account.

### *5.2.4 Cover principle*

Giro accounts at the Bundesbank must always remain in credit; overdrafts are not permitted. The credit institutions are allowed a degree of latitude so that strict adherence to the cover principle laid down in accordance with the Deutsche Bundesbank Act does not delay the payment process in the course of the day:

- cheques and direct debits credited "subject to collection" can be used by the Bundesbank as cover for credit transfer orders;
- the giro account may be overdrawn in the course of the day up to the value of the security lodged (lombard giro overdraft).

Under the lombard giro overdraft facility, designed to smooth the giro and clearing process, credit institutions authorise the Bundesbank to arrange lombard credit on their behalf to cover any unanticipated debit balance on their giro accounts. Lombard loans are granted by the Bundesbank against the pledging of securities, with the credit limit differing according to the type of collateral (e.g. up to 90% of the nominal value of bills of exchange and up to 75% of the market value in the case of bonds). Credit institutions can use assets pledged for normal lombard credit to secure lombard overdrafts on their giro accounts. As a rule, the Bundesbank only makes use of this

facility if giro accounts show a debit balance at the close of clearing. Debit balances arising during the day are permitted, provided unused lombard facilities are available. Any debits that exceed the collateral value of the securities pledged (e.g. as a result of telegraphic transfer orders) are not executed. The banks may alter the level of their collateral or revoke the loan authorisation only with the agreement of the Bundesbank.

Interest on lombard credit is calculated on the debit balance outstanding at the close of clearing, for at least one day. The credit institution can also give the Bundesbank a blanket authorisation to reduce a lombard loan using incoming funds on its giro account (lombard giro overdraft with automatic repayment). Most banks make use of this possibility since it minimises their interest costs.

#### *5.2.5 Pricing policy*

Like all Bundesbank policy decisions, policy with respect to cashless payments is determined by the Central Bank Council. The Bundesbank's policy with regard to its terms and charges for payment services to banks is essentially based on the principle of direct and appropriate central bank involvement in the payment system with due regard for the existing network structures. The Bundesbank sees its role mainly in large-value payment transactions, which it wants to encourage further. It has never sought a monopoly in the bulk payments field. Until 1991 the Bundesbank charged only for special services associated with cashless payments (e.g. the telegraphic execution of a credit transfer), but now it charges for all its payment services. The charges are intended to encourage efficient procedures and, for example, to place the more labour-intensive paper-based traffic at a relative disadvantage; in addition, the Bundesbank aims gradually to reduce the high proportion of collection items which passes through its bulk payment systems. The provision of giro accounts to credit institutions continues to be free of charge; other giro account holders (non-banks, private individuals), for whom accounts may be opened in exceptional circumstances, pay an administrative fee of DM 30 per month. (Selected fees in Bundesbank large-value systems are discussed in Section 3.2.)

#### *5.2.6 The role of the central bank in securities settlement arrangements*

The Bundesbank makes its payment system available to the branches of *Deutscher Kassenverein AG*, which effects the settlement of securities transactions, and the members of its clearing system. This enables them to deliver securities against final payment in central bank money. Cash settlement is effected uniformly by means of simultaneous booking nationwide of participants' final balances on their giro accounts at the Bundesbank branches in the seven centres with stock exchanges (Berlin, Dusseldorf, Frankfurt, Hamburg, Hanover, Munich and Stuttgart).

### 5.3 Monetary policy and payment systems

The Deutsche Bundesbank Act provides the Bundesbank with a range of interest rate and liquidity policy instruments to carry out its tasks. For example, by setting the discount and lombard rates, the central bank is able to influence short-term interest rates and money market conditions in pursuit of its monetary objectives. The Bundesbank's policy is mainly designed to influence the banks' lending behaviour and the demand for money and credit in the economy indirectly through changes in bank liquidity and through the interest rate mechanism in the financial markets. Domestic credit institutions make their excess central bank balances available to other banks on the money market, so that money market transactions are the main vehicle for liquidity adjustment across the banking system.

Changes in the banks' minimum reserve requirements are an important instrument of liquidity policy. According to the present minimum reserve regulations, the Bundesbank may require banks to hold a specific percentage of their liabilities in respect of sight deposits and other borrowed

funds as balances on giro accounts with it (minimum reserves). The ratio set by the Bundesbank for sight liabilities, for example, may not exceed 30%. A bank's average balance with the Bundesbank over a given month (actual reserves) must at least equal the required percentages of its monthly average liabilities subject to reserve requirements (required reserves). No interest is payable on minimum reserve balances. Since the minimum reserve requirement has to be met only on a monthly average basis, the banks can use their central bank balances for payment purposes and, if necessary, withdraw them temporarily, provided that they maintain correspondingly higher balances on other days during the reserve accounting period. The balances maintained with the central bank in order to comply with the minimum reserve requirement are therefore at the same time "working balances" because the banks do not need to hold other central bank balances in addition to their minimum reserves specifically for current payments purposes. In fact, the excess reserves (i.e. the amount by which the average balances exceed the required reserves) are generally low (around 1% of the reserve requirement). In December 1992 excess reserves amounted to DM 1.2 billion.

Whether the Bundesbank's involvement in cashless payments has significance for monetary and credit policy depends primarily on whether the banks' demand for central bank money can thereby be substantially influenced. Conventional wisdom has it that the giro networks "save" central bank money, as incoming and outgoing payments tend to offset one another and the payment balances remain correspondingly small.

## 5.4 Central bank arrangements to limit risk

The Bundesbank endeavours to ensure a high level of security in the systems it uses for its payment services.

### *5.4.1 Technical and organisational measures to limit risk*

Attaining a high level of security is an important consideration not least in the context of the Bundesbank's programme to broaden electronic customer access. The use of a gateway system to decouple the central bank's system from the banks' own systems makes it easier for the Bundesbank to prevent unauthorised access to the processing systems. Access control is ensured by verification of the caller's station identification (so-called DTE address) transmitted via the Datex-P network, using automatically generated dynamic passwords which are changed every day. The identification of the sender and the integrity of the data are ensured by means of encryption procedures based on the Data Encryption Standard algorithm.

### *5.4.2 Limiting systemic risk*

The Bundesbank has begun discussions with the banking industry on ways of containing the systemic risk inherent in net settlement systems (see also Section 3.2.4 (g)).

## 5.5 Future developments

Over the next few years payments in paper-based form can be expected to continue to decline. The further development of payment services at the Bundesbank will thus be shaped primarily by the decline in the processing of paper-based items and the ongoing extension of electronic access (see Section 5.2.3). This programme is designed to provide a standardised technical communications interface offering all participants a medium for the efficient handling of electronic payments that is capable of future enhancement. In the long run it may also be used for other transactions and information processing.

According to current plans the programme will be implemented in several stages, with priority being given to extending the range of cashless payment services. This will include, inter alia, the introduction at the Electronic Counter of credit transfers in S.W.I.F.T. format for forwarding within Germany and a facility for submitting payment orders for payees abroad and receiving incoming payments from abroad electronically.

Subsequent stages planned include the electronic presentation and delivery of bulk payments in DTA format and an electronic account information facility for calling up statements of account and account balances.

In the light of these further developments in electronic access, the banking industry has already announced that additional credit institutions will avail themselves of the service.

Finally, the ongoing discussion concerning the handling of cashless payments in the European Community will also have an impact on the role of the Bundesbank in the payment system.

Annex 1

**Terms and abbreviations relating to payment systems in Germany***

| German name of system | Abbreviation | English term |
|---|---|---|
| Abrechnung | | daily local clearing system |
| Elektronische Abrechnung mit Filetransfer | EAF | daily electronic clearing with file transfer |
| Eiliger Zahlungsverkehr | EIL-ZV | express electronic intercity credit transfer system |
| Platzüberweisungsverkehr | | express (paper-based) local credit transfer system |
| Elektronischer Schalter | ELS | electronic counter |
| Belegloser Datenträger-austausch | DTA | exchange of data media |
| Maschinell-optische Beleglesung | MAOBE | OCR document reading |
| Vereinfachter Scheck- und Lastschrifteinzug | | simplified cheque and direct debit collection procedure |

* Payment systems operated by the Deutsche Bundesbank.

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Table 1

**Basic statistical data**

| | **1988**[1] | **1989**[1] | **1990** | **1991** | **1992** |
|---|---|---|---|---|---|
| Population (millions) ..... | 61.7 | 62.7 | 79.8 | 80.3 | 81.0 |
| *average* ..... | *61.4* | *62.1* | *79.4* | *80.0* | *80.6* |
| GDP (DEM billions)[1] ..... | 2,096.0 | 2,224.4 | 2,425.2 | 2,635.0 | 2,794.2 |
| GDP per capita (DEM thousands)[1] ..... | 34.0 | 35.5 | 38.1 | 40.9 | 42.8 |
| Exchange rate (domestic currency vis-à-vis USD): | | | | | |
| *year-end* ..... | *1.7803* | *1.6978* | *1.4940* | *1.5160* | *1.6140* |
| *average* ..... | *1.7584* | *1.8813* | *1.6161* | *1.6612* | *1.5595* |

[1] Old Länder only.

Table 2

**Settlement media used by non-banks**

(at year-end, in billions of Deutsche Mark)

| | **1988**[1] | **1989**[1] | **1990** | **1991** | **1992** |
|---|---|---|---|---|---|
| Notes and coin[2] ..... | 142.6 | 146.9 | 158.6 | 171.8 | 200.5 |
| Narrow money supply ($M_1$)[3] ..... | 427.0 | 450.7 | 584.3 | 604.0 | 669.6 |
| *Memorandum item:* | | | | | |
| Broad money supply ($M_3$)[3] ..... | 1,189.6 | 1,255.6 | 1,503.0 | 1,597.7 | 1,718.7 |
| Transferable deposits[4] ..... | 287.9 | 310.6 | 444.9 | 445.0 | 469.5 |
| *of which held by:* | | | | | |
| *persons* ..... | *171.2* | *176.3* | *240.2* | *253.7* | *288.5* |
| *corporate sector* ..... | *95.9* | *107.3* | *151.0* | *149.2* | *152.1* |
| *other* ..... | *20.8* | *27.0* | *53.7* | *42.1* | *28.9* |

[1] Old Länder only. [2] Currency in circulation (excluding credit institutions' cash balances). [3] $M_1$ = currency in circulation (excluding credit institutions' cash balances) + domestic non-banks' sight deposits (excluding public sector's deposits held at the central bank). $M_2$ = $M_1$ + domestic non-banks' time deposits for less than four years. $M_3$ = $M_2$ + savings deposits of domestic non-banks at statutory notice. [4] Sight deposits of domestic non-banks (including deposits held at the central bank).

Table 3

**Settlement media used by banks**

(at year-end, in billions of Deutsche Mark)

| | 1988[1] | 1989[1] | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Reserve balances held at central bank[2] ..... | 57.1 | 58.9 | 70.9 | 75.0 | 86.4 |
| *of which:* | | | | | |
| *required reserves*[3] ..... | *56.5* | *58.1* | *68.9* | *73.6* | *85.2* |
| Transferable deposits at other institutions ..... | 101.4 | 110.4 | 256.4 | 226.9 | 301.2 |
| *Memorandum item:* | | | | | |
| Institutions' borrowing from central bank[4] ..... | 11.2 | 5.2 | 6.2 | 1.9 | 1.6 |

[1] Old Länder only. [2] Actual reserves. [3] After deduction of deductible cash balances. [4] Lombard loans.

Table 4

**Banknotes and coin**

(at year-end, in billions of Deutsche Mark)

| | 1988[1] | 1989[1] | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Total banknotes and coin outstanding ..... | 154.8 | 162.1 | 179.7 | 194.6 | 227.3 |
| Denomination of banknotes: | | | | | |
| *1,000 Mark* ..... | *39.7* | *39.5* | *40.7* | *46.9* | *64.3* |
| *500 Mark* ..... | *19.1* | *19.6* | *21.1* | *21.5* | *24.0* |
| *200 Mark* ..... | - | - | *6.6* | *9.6* | *11.5* |
| *100 Mark* ..... | *62.7* | *66.4* | *69.6* | *73.8* | *82.1* |
| *50 Mark* ..... | *13.5* | *15.0* | *17.9* | *18.3* | *19.4* |
| *20 Mark* ..... | *5.4* | *6.0* | *6.7* | *6.7* | *7.4* |
| *10 Mark* ..... | *3.3* | *3.8* | *4.0* | *4.2* | *4.4* |
| *5 Mark* ..... | *0.2* | *0.3* | *0.3* | *0.3* | *0.3* |
| Banknotes and coin held by credit institutions ..... | 12.2 | 15.2 | 21.1 | 22.8 | 26.8 |
| Total banknotes and coin outside credit institutions[2] | 142.6 | 146.9 | 158.6 | 171.8 | 200.5 |

[1] Old Länder only. [2] Identical with Table 2, "Notes and coin".

Table 5

**Institutional framework**

(at end-1992)

| Categories | Number of institutions | Number of branches[1] | Number of accounts (thousands)[2] | Value of accounts (DEM billions) |
|---|---|---|---|---|
| Central bank | 10[3] | 190[3] | 37 | 1.2 |
| Commercial banks[4] | 410 | 8,156 | 15,700 | 154.1 |
| Savings banks | 730 | 20,739 | 36,400 | 187.1 |
| Cooperative and rural banks | 2,915 | 20,790 | 20,300 | 101.8 |
| Postbank | 1 | 22,001 | 5,000 | 25.3 |
| *Memorandum item:* | | | | |
| Branches of foreign banks | 56 | 95 | . | . |

[1] Branches = number of bank offices. [2] Sight accounts of domestic non-banks, partly estimated. [3] The Bundesbank as a legal entity comprises the Central Office (in Frankfurt am Main) and nine Land Central Banks as well as 190 branches. [4] Including mortgage banks, instalment sales financing institutions, banks with special functions and building and loan associations.

Table 6

**Cash dispensers, ATMs and EFTPOS terminals[1]**

| | 1988[2] | 1989[2] | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Cash dispensers and ATMs: | | | | | |
| *Number of networks* | *4* | *4* | *4* | *4* | *4* |
| *Number of terminals* | *7,500* | *9,300* | *11,300* | *13,750* | *19,000* |
| *Volume of transactions (millions)* | . | . | . | . | . |
| *Value of transactions (DEM billions)* | . | . | . | . | . |
| EFTPOS: | | | | | |
| *Number of networks* | *5* | *5* | *11* | *18* | *18* |
| *Number of terminals* | *8,669* | *10,928* | *23,152* | *34,673* | *51,806* |
| *Volume of transactions (millions)* | *0.6* | *0.8* | *3.5* | *20.2* | *28.0* |
| *Value of transactions (DEM billions)* | *0.1* | *0.1* | *0.2* | *1.8* | *1.9* |

[1] Partly estimated. [2] Old Länder only.

Table 7

**Number of payment cards in circulation**[1]

(at year-end, in thousands)

| | **1988**[2] | **1989**[2] | **1990** | **1991** | **1992** |
|---|---|---|---|---|---|
| Cards with a cash function | . | . | . | . | . |
| Cards with a debit/credit function | 23,455 | 25,916 | 28,726 | 33,528 | 39,272 |
| *of which:* | | | | | |
| *cards with a debit function*[3] | *21,131* | *22,281* | *23,729* | *27,424* | *31,863* |
| *cards with a credit function* | *2,324* | *3,635* | *4,997* | *6,104* | *7,409* |
| Cards with a cheque guarantee function | 21,131 | 22,281 | 23,729 | 27,424 | 31,863 |
| Retailer cards | . | . | . | 1,500 | 3,000 |

[1] Partly estimated. [2] Old Länder only. [3] Eurocheque cards, eligible for cash and debit functions in association with a Personal Identification Number (PIN).

Table 8

**Payment instructions handled by selected payment systems:[1] volume of transactions**

(in millions)

| | 1988[2] | 1989[2] | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Maschinell-optische Beleglesung (MAOBE)[3] | 624.1 | 635.3 | 677.5 | 667.5 | 588.5 |
| *Cheques and direct debits* | *354.4* | *346.1* | *324.5* | *320.4* | *291.7* |
| *Credit transfers* | *269.7* | *289.2* | *353.0* | *347.1* | *296.8* |
| Belegloser Datenträgeraustausch[4] | 1,401.8 | 1,513.3 | 1,744.5 | 2,094.7 | 2,061.1 |
| *Truncated cheques and direct debits* | *1,210.3* | *1,306.2* | *1,475.7* | *1,698.1* | *1,616.6* |
| *Credit transfers* | *191.5* | *207.1* | *268.8* | *396.6* | *444.5* |
| Direktverkehr[5] | 3.3 | 4.0 | 5.4 | 5.7 | 3.1 |
| *of which:* | | | | | |
| *Eiliger Zahlungsverkehr (EIL-ZV)*[6] | *0.9* | *1.4* | *2.4* | *3.0* | *2.6* |
| *of which: "telegraphic"* | *0.6* | *0.8* | *0.9* | *1.2* | *1.9* |
| Platzüberweisungs-verkehr[7] | 51.2 | 45.1 | 23.1 | 80.2 | 71.9 |
| Abrechnung[8] | 256.1 | 248.3 | 234.4 | 338.0 | 381.2 |
| *Cheques and other collection items* | *48.4* | *44.3* | *40.1* | *44.8* | *57.2* |
| *Credit transfers* | *207.7* | *204.0* | *194.3* | *293.2* | *324.0* |
| Elektronische Abrechnung mit File-transfer:[9] | | | | | |
| *Credit transfers* | - | - | *2.3* | *5.0* | *7.8* |

[1] Payment systems operated by the Bundesbank. [2] Old Länder only. [3] OCR document reading. [4] Exchange of data media. [5] Direct traffic between branches of the Deutsche Bundesbank. [6] Electronic intercity credit transfers. [7] Express (paper-based) local credit transfer system. [8] Daily local clearing system. [9] Daily electronic clearing with file transfer.

Table 9

**Payment instructions handled by selected payment systems:[1] value of transactions**

(in billions of Deutsche Mark)

| | 1988[2] | 1989[2] | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Maschinell-optische Beleglesung (MAOBE)[3] | 2,386.6 | 2,602.4 | 2,920.6 | 3,260.8 | 3,148.2 |
| *Cheques and direct debits* | *2,169.1* | *2,361.9* | *2,609.0* | *2,964.3* | *2,960.1* |
| *Credit transfers* | *217.5* | *240.5* | *311.6* | *296.5* | *188.1* |
| Belegloser Datenträgeraustausch[4] | 774.0 | 879.4 | 1,134.2 | 1,462.6 | 1,697.9 |
| *Truncated cheques and direct debits* | *493.1* | *570.1* | *718.7* | *843.9* | *872.1* |
| *Credit transfers* | *280.9* | *309.3* | *415.5* | *618.7* | *825.8* |
| Direktverkehr[5] | 6,495.9 | 7,683.4 | 9,469.1 | 11,764.6 | 13,977.1 |
| *of which:* | | | | | |
| *Eiliger Zahlungsverkehr (EIL-ZV)[6]* | *4,391.6* | *6,617.0* | *8,354.2* | *10,792.2* | *13,611.0* |
| *of which: "telegraphic"* | *3,988.6* | *5,721.0* | *7,208.6* | *9,705.8* | *13,349.3* |
| Platzüberweisungs-verkehr[7] | 6,732.1 | 7,057.8 | 8,405.2 | 8,119.2 | 8,430.2 |
| Abrechnung[8] | 75,467.6 | 104,137.9 | 86,180.2 | 63,856.3 | 55,377.1 |
| *Cheques and other collection items* | *678.6* | *674.0* | *698.9* | *735.7* | *818.9* |
| *Credit transfers* | *74,789.0* | *103,463.9* | *85,481.3* | *63,120.6* | *54,558.2* |
| Elektronische Abrechnung mit File-transfer:[9] | | | | | |
| *Credit transfers* | - | - | *24,993.1* | *54,936.2* | *83,023.1* |

[1] Payment systems operated by the Bundesbank. [2] Old Länder only. [3] OCR document reading. [4] Exchange of data media. [5] Direct traffic between branches of the Deutsche Bundesbank. [6] Electronic intercity credit transfers. [7] Express (paper-based) local credit transfer system. [8] Daily local clearing system. [9] Daily electronic clearing with file transfer.

Table 10

**Transfer instructions handled by securities settlement systems: volume of transactions**

(in millions)

| | 1988[1] | 1989[1] | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| DKV ..... | . | 19.9 | 22.1 | 20.5 | 22.6 |
| *Delivery versus payment* ..... | . | *11.9* | *16.2* | *16.4* | *16.5* |
| *Without countervalue* .. | . | *8.0* | *5.9* | *4.1* | *6.1* |

[1] Old Länder only.

Table 11

**Transfer instructions handled by securities settlement systems: value of transactions**

(in billions of Deutsche Mark)

| | 1988[1] | 1989[1] | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| DKV: | | | | | |
| *Delivery versus payment* ..... | . | *2,789.5* | *3,078.3* | *2,852.9* | *4,663.5* |

[1] Old Länder only.

Table 12

**Indicators of use of various cashless payment instruments: volume of transactions**[1]

(in millions)

| Instruments | 1988[2] | 1989[2] | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Cheques issued | 637.0 | 661.0 | 784.0 | 880.0 | 902.0 |
| *of which:* | | | | | |
| *truncated*[3] | *366.0* | *413.0* | *573.0* | *643.0* | *658.0* |
| Payments by credit and debit cards[4] | 46.6 | 82.6 | 121.7 | 170.3 | 214.0 |
| Paper-based credit transfers | 1,646.4 | 1,684.4 | 1,835.4 | 2,012.3 | 1,991.2 |
| *of which:* | | | | | |
| *customer initiated* | *1,624.0* | *1,659.0* | *1,812.0* | *1,989.0* | *1,971.0* |
| *interbank/large-value*[5] | *22.4* | *25.4* | *23.4* | *23.3* | *20.2* |
| Paperless credit transfers | 1,795.0 | 1,872.1 | 2,264.5 | 2,697.3 | 3,092.4 |
| *of which:* | | | | | |
| *customer initiated* | *1,794.0* | *1,871.0* | *2,261.0* | *2,691.0* | *3,083.0* |
| *interbank/large-value*[5] | *1.0* | *1.1* | *3.5* | *6.3* | *9.4* |
| Direct debits[6] | 2,380.0 | 2,589.0 | 2,939.5 | 3,419.8 | 4,016.0 |
| **Total** | 6,505.0 | 6,889.1 | 7,945.1 | 9,179.7 | 10,215.6 |

[1] Partly estimated. [2] Old Länder only. [3] Not included in direct debits in order to avoid double-counting. [4] Excluding retailer cards. Credit cards: the card companies' settlements with the retailers (normally credit transfers) and payment of the monthly totals by cardholders to card issuers by credit transfer, direct debit or cheque are contained in the corresponding items. Debit cards: not included in item "direct debits". [5] Only interbank payments via the Bundesbank in the Abrechnung in Frankfurt, Elektronische Abrechnung mit Filetransfer, Eiliger Zahlungsverkehr and Platzüberweisungsverkehr. 6 Including cash dispenser/ATM withdrawals made with eurocheque cards at banks other than that issuing the card.

Table 13

**Indicators of use of various cashless payment instruments: value of transactions**[1]

(in billions of Deutsche Mark)

| Instruments | 1988[2] | 1989[2] | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Cheques issued | 3,786.0 | 4,644.0 | 3,997.0 | 4,443.0 | 4,583.0 |
| *of which:* | | | | | |
| *truncated*[3] | *102.0* | *123.0* | *228.0* | *254.0* | *261.0* |
| Payments by credit and debit cards[4] | 11.1 | 15.9 | 22.6 | 30.0 | 35.7 |
| Paper-based credit transfers | 89,675.7 | 120,675.4 | 105,029.3 | 84,343.0 | 76,837.7 |
| *of which:* | | | | | |
| *customer initiated* | *11,256.0* | *13,287.0* | *14,548.0* | *16,273.0* | *19,303.0* |
| *interbank/large-value*[5] | *78,419.7* | *107,388.4* | *90,481.3* | *68,070.0* | *57,534.7* |
| Paperless credit transfers | 8,692.0 | 9,766.0 | 35,646.0 | 68,349.0 | 103,156.0 |
| *of which:* | | | | | |
| *customer initiated* | *2,992.0* | *3,532.0* | *4,103.0* | *5,424.0* | *9,508.0* |
| *interbank/large-value*[5] | *5,700.0* | *6,234.0* | *31,543.0* | *62,925.0* | *93,648.0* |
| Direct debits[6] | 1,673.0 | 2,025.0 | 2,573.8 | 2,902.2 | 3,906.1 |
| **Total** | 103,837.8 | 137,126.3 | 147,268.7 | 160,067.2 | 188,518.5 |

[1] Partly estimated. [2] Old Länder only. [3] Not included in direct debits in order to avoid double-counting. [4] Excluding retailer cards. Credit cards: the card companies' settlements with the retailers (normally credit transfers) and payment of the monthly totals by cardholders to card issuers by credit transfer, direct debit or cheque are contained in the corresponding items. Debit cards: not included in item "direct debits". [5] Only interbank payments via the Bundesbank in the Abrechnung in Frankfurt, Elektronische Abrechnung mit Filetransfer, Eiliger Zahlungsverkehr and Platzüberweisungsverkehr. 6 Including cash dispenser/ATM withdrawals made with eurocheque cards at banks other than that issuing the card.

Table 14

**Participation in S.W.I.F.T. by domestic institutions**

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Members | 133 | 135 | 147 | 150 | 152 |
| *of which: live* | *130* | *134* | *135* | *144* | *148* |
| Sub-members[1] | 59 | 64 | 70 | 81 | 84 |
| *of which: live* | *58* | *62* | *61* | *71* | *79* |
| Participants[2] | 1 | 1 | 1 | 1 | 2 |
| *of which: live* | *0* | *1* | *1* | *1* | *1* |
| Total users | 193 | 200 | 218 | 232 | 238 |
| *of which: live* | *188* | *197* | *197* | *216* | *228* |
| *Memorandum items:* | | | | | |
| Total S.W.I.F.T.: | | | | | |
| *members* | *1,581* | *1,697* | *1,812* | *1,963* | *2,074* |
| *sub-members* | *1,228* | *1,315* | *1,469* | *1,607* | *1,738* |
| *participants* | *27* | *37* | *63* | *78* | *91* |
| *users* | *2,836* | *3,049* | *3,344* | *3,648* | *3,903* |

[1] Domestic users sponsored by members abroad. [2] Participants are not shareholders in S.W.I.F.T. and their message traffic over the network is restricted.

*Source:* S.W.I.F.T.

Table 15

**S.W.I.F.T. message flows to/from domestic users**

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Total messages sent ..... | 22,806,525 | 25,857,693 | 28,299,791 | 30,963,599 | 32,585,476 |
| *of which:* | | | | | |
| *category I* ..... | *8,427,480* | *9,306,430* | *10,261,651* | *11,027,035* | *11,997,937* |
| *category II* ..... | *5,331,498* | *5,864,269* | *6,180,512* | *6,563,223* | *6,747,897* |
| *of which:* | | | | | |
| *sent/received to/from domestic users* ..... | *3,890,976* | *4,409,370* | *4,768,910* | *5,158,337* | *5,527,524* |
| Total messages received ..... | 31,628,862 | 35,996,386 | 38,740,113 | 42,081,217 | 44,887,628 |
| *of which:* | | | | | |
| *category I* ..... | . | . | . | . | *14,832,041* |
| *category II* ..... | . | . | . | . | *18,220,015* |
| *Memorandum item:* | | | | | |
| Global S.W.I.F.T. traffic .. | 255,142,610 | 298,780,982 | 332,895,932 | 365,159,291 | 405,540,962 |

*Source:* S.W.I.F.T.

**Methodology and sources used for the compilation of Tables 12 and 13**

Tables 12 and 13 include payments irrespective of whether the issuer of the order is a resident or non-resident.

For statistical reasons the tables include all cheques collected from the bank at which the account is held via the clearing system or used by the account holder to withdraw cash. They therefore also include cheques made out for the purpose of withdrawing cash over the counter at a bank other than that at which the account is held and hence collected via the clearing system.

As regards payments by credit card it should be noted that credit card companies' settlements with retailers (normally credit transfers) and also payment of the monthly totals by cardholders to card issuers (by credit transfer, direct debit or cheque) are contained in the corresponding items.

For credit transfers the breakdown between paper-based and paperless credit transfers is determined according to the banks' conversion of customers' paper-based credit transfers into paperless credit transfers.

The figures for paper-based credit transfers also include cash paid in and transferred for crediting to an account held at another branch of the same bank or another bank.

The figures for direct debits include all payments under debit/collection authorisations, which arise out of different underlying transactions (see the relevant section of the Red Book). They thus also include cash withdrawals at cash dispensers and ATMs, where these are effected at a bank other than that at which the account is held. These are collected as direct debits via the clearing system. In addition, the figures also include transactions arising out of eurocheques made out abroad by holders of accounts at German credit institutions and collected by the German clearing agent, the (*Gesellschaft für Zahlungssysteme mbH (GZS),* from the drawee bank by means of a direct debit. Direct debits for collecting the proceeds of truncated cheques are not included; thus double-counting is avoided.

# PAYMENT SYSTEMS IN ITALY

# Table of contents

## INTRODUCTION

The payment system in Italy has changed in significant ways in recent years in response to both demand and supply-side stimuli. One result has been a gradual shift in the relative importance of the various payment services and instruments.

The growing use of bank and postal instruments has been accompanied by a rise in the number of current accounts held by customers; the number of transactions effected by means of credit transfers, direct debits and payment cards has increased.

The drive for greater efficiency and security has intensified the involvement of the public authorities in ensuring the smooth functioning of the payment system; the conviction has been that these objectives cannot be achieved by market forces alone. In accordance with the analysis set forth in the Banca d'Italia's 1987 "White Paper on the Payment System in Italy", the central bank has promoted a modernisation of the payment system based on greater competition among providers of payment services and fuller integration among the different agents that participate in the system.

Banks have been given considerable freedom of initiative in the field of innovative services in order to exploit the opportunities offered by new technology; by contrast, the modernisation of shared infrastructure and processes has been the subject of a comprehensive plan of intervention. The combined action of the Banca d'Italia, the Interbank Convention on Automation (CIPA) and the Italian Bankers' Association (ABI) has focused on the procedures for exchanging documents and accounting data, integration between the banking and postal payment circuits, and the clearing and settlement of interbank payments and securities transactions. The process of reform has been accompanied and made possible by important changes in technical infrastructure.

The reform of the clearing and settlement systems for interbank and securities transactions has had beneficial effects on banks' cash management and, more generally, on the overall functioning of the payment system and securities transactions. A significant step in the field of bank instruments and services regarded cheques; the exchange of cheques is now channelled into the clearing system through two new interbank procedures.

Today, the stability and efficiency of financial structures depend increasingly on the functional efficiency of clearing and settlement systems. In its institutional capacity as guarantor of the stability of the financial system and in the light of the implications of current developments for monetary policy, the Banca d'Italia is now promoting the adoption of measures to control the risks that arise in clearing and settlement systems.

Furthermore, the evolution towards the European Economic and Monetary Union highlights the need for closer integration and harmonisation of the features of the EC countries' payment systems. Accordingly, the Banca d'Italia is revising the features of the domestic payment system in line with the common guidelines that are being established at the EC level.

## 1. INSTITUTIONAL ASPECTS

### 1.1 General legal aspects

The regulation of the payment system in Italy is based on provisions of the Italian Civil Code, the Banking Code of 1st September 1993 and other specific laws.

The circulation of individual paper-based payment instruments (e.g. cheques) and the discharging of financial obligations (e.g. novation and bilateral clearing) are governed by the

provisions of the Civil Code and other specific regulations.[1] The Law on the note issue gives the Banca d'Italia exclusive responsibility for issuing notes and managing the clearing houses.[2]

The 1993 Banking Code[3] defines banks and empowers the Banca d'Italia with both the supervision over the banking system and explicit responsibilities and powers in the field of the payment system (see Section 1.3.2).

With regard to the transparency of banking services, Law 154/1992 empowered the Banca d'Italia to establish the information banks are required to provide to customers (see Section 1.3.2).

Competition is safeguarded by the anti-trust Law, which provides for a Competition Authority and forbids the abuse of dominant positions and agreements that restrict competition. Responsibility for preventing restrictive practices in the banking and payment systems is entrusted to the Banca d'Italia, which is accordingly required to safeguard both stability and competition.[4]

Law 197/1991 empowers the Banca d'Italia to supervise the activities of non-banks that operate in the payment system, including operators that carry out transfers of funds via payment cards. The same law limits the use of cash to payments up to 20 million lire in order to prevent money laundering.

The activities of the Postal Administration in the payment system, i.e. postal current accounts and funds transfer operations, are governed by specific regulations.[5] A project to denationalise the Postal Administration is presently being worked out that will affect the regulations governing the postal activity as a whole.

Securities investment business and the organisation of the stock market are regulated by Law 1 of 2nd January 1991. This provides for the creation of multi-functional securities investment firms (SIM), which in the long term will be the only non-bank operators authorised to engage in securities business. In the financial market, the Consob (Companies and Stock Exchange Commission) is responsible for guaranteeing the transparency of information and the correctness of contracts, while the Banca d'Italia is responsible for ensuring compliance with the requirements designed to protect stability.

## 1.2 The role of financial intermediaries

The main providers of payment services are the banking system, the Postal Administration and the Banca d'Italia.

At the end of 1992 the **banking system** comprised 1,024 credit institutions with 20,789 branches; foreign banks numbered 40 with 52 branches.

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1 Decree Law 1345 of 21st September 1933 and Law 1736 of 21st December 1933.

2 Decree Law of 6th May 1926.

3 The Banking Code of 1st September 1993 brings together several provisions concerning the banking activity: Legislative Decree 481 of 14th December 1992 which incorporated the Second Council Directive on Banking Coordination, and replaced part of the Banking Law of 1936; the articles of the Banking Law of 1936 that had not been repealed; Law 197/1991 on financial companies; Law 218/1990 on mergers and the transformation of publicly-owned credit institutions; etc.

4 Law 287 of 10th October 1990.

5 Presidential Decrees 156 of 29th March 1973 and 256 of 1st June 1989.

The 1993 Banking Code defines banking activity as the receipt of savings from the public and the granting of credits. It is confined to the sole credit institutions,[6] that are also authorised to engage in the other activities subject to mutual recognition throughout the Economic Community under the Second Banking Coordination Directive, notably the issue and management of payment instruments.

In recent years the structure of the banking system has changed considerably. Law 218 of 30th July 1990 allows publicly-owned credit institutions to transfer their banking activities to limited companies, convert their capital parts into shares and merge with other banks, including those belonging to categories that were previously precluded. The law also encourages banks to increase their size by granting tax relief for mergers. As a result of mergers the number of banks fell from 1,064 at the end of 1990 to 1,024 at the end of 1992. By contrast, since March 1990, when branching regulations were liberalised, the number of branches has increased by 33%.

The payment services provided by the **Postal Administration** through its 14,412 offices include postal current accounts and cash transfer facilities. The capillarity of the postal circuit makes postal current account services particularly suited to handle retail collections and payments on behalf of public bodies and utility companies. In recent years several steps have been taken to increase the integration of the postal and banking circuits. Furthermore, a project aimed at denationalising the Postal Administration is being presently worked out (see Section 2.2.5).

Payment services provided by **non-bank operators** account for only a small share of the total and are limited to innovative instruments such as payment cards.

## 1.3 The role of the central bank

The powers invested in the central bank enable it to exercise a controlling and guiding influence over banking activities in the field of payment services. Accordingly, the Banca d'Italia participates in the system in a number of ways:

- by directly offering instruments and services and acting as agent of the Treasury for in-payments and out-payments;
- by supervising the activities of the banking system;
- by coordinating and promoting interbank initiatives.

### *1.3.1 Instruments and services*

The Banca d'Italia has the exclusive right to issue banknotes, the smallest denomination being Lit. 1,000, while the Treasury directly issues currency in units of less than Lit. 1,000 in the form of coin. Through its ninety-eight branches the Banca d'Italia circulates notes and coin and ensures that the needs of the public are met. Another payment instrument issued by the Banca d'Italia is the cashier's cheque ("vaglia cambiario"), a guaranteed instrument used mainly for making payments such as tax refunds on behalf of the Treasury.

The Banca d'Italia provides banks with accounts for the settlement of direct interbank transactions and of balances arising from clearing operations. At present, only credit institutions hold accounts with the Banca d'Italia for settlement purposes; the accounts are known as "centralised accounts" ("Conti di gestione") and include reserve accounts for banks' compulsory reserves, deposit accounts for banks not subject to reserve requirements, and ordinary advance accounts (see

6 With regard to bank deposits and savings, the Legislative Decree 481/1992 and the 1993 Banking Code provide for a derogation for EC member states and local authorities. Additional collection activities may be authorised provided proper controls to protect investors are ensured.

Section 5.2). The Banca d'Italia provides banks with an electronic system for the real-time execution of funds transfers on centralised accounts (see Section 3.2).

The Banca d'Italia operates the clearing and settlement systems for banking items and securities transactions.

The clearing system for banking items comprises sub-systems to handle: paper-based operations which require the exchange of supporting paper documents, paperless retail transactions and paperless wholesale transactions. Payments entering the sub-systems flow through a national clearing procedure ("Compensazione nazionale dei recapiti") that generates a single balance at a national level for each participant; this balance is then settled through credit and debit operations on accounts at the Banca d'Italia. Access to the clearing systems is confined to deposit-taking institutions.

The clearing of securities transactions is managed by the clearing houses in the cities where the main stock exchanges are located. Clearing houses provide three kinds of securities settlement ("Liquidazioni dei titoli") at a national level: daily settlement, monthly settlement and extraordinary settlement. Credit institutions, securities investment firms and stockbrokers may take part in the clearing and settlement sessions (see Section 4.2).

Since 1980 the Banca d'Italia has provided a system for the centralised management of government securities that can be used by all economic agents.

### *1.3.2 Supervisory authority*

The Banca d'Italia is responsible for regulating and supervising the banking system pursuant to directives issued by the Credit Committee.[7] The 1993 Banking Code empowers the Banca d'Italia to establish supervisory requirements, monitor banks by way of prudential returns and on-site inspections and impose sanctions where necessary.

The Banca d'Italia also establishes the information relating to banking services that banks are required to provide to customers and supervises financial companies such as investment funds management companies, securities investment firms (SIM) and non-banks operating in the payment system (see Section 1.2).

The 1993 Banking Code also entrusts the Banca d'Italia with specific responsibilities and powers in the field of payment systems. Article 146 states that "the Banca d'Italia shall promote the smooth functioning of payment systems. To this end it may enact specific regulations designed to ensure effective and reliable clearing and payment systems".

### *1.3.3 Promotion of interbank initiatives*

The Banca d'Italia promotes interbank initiatives within the Interbank Convention on Automation (CIPA), an association of about one hundred banks whose main concern is to develop joint projects primarily in the field of payment services. Its Management Committee and General Meeting are chaired by a representative of the Banca d'Italia, which also provides its secretariat. In January 1991 the Banca d'Italia issued a directive establishing guidelines for CIPA member banks to improve customer payment services, pricing policies and banking infrastructures.

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7 The Interministerial Committee for Credit and Savings (CICR), created in 1947 and headed by the Minister for the Treasury, is responsible for policy on monetary, financial and foreign exchange issues, for promulgating regulations and providing instructions to the Banca d'Italia where appropriate.

### 1.4. The role of other private and public sector bodies

Recent years have seen the growth of cooperative ventures in the banking system.

The **Italian Bankers' Association (ABI)** has traditionally played an important role in promoting banking cooperation. The function of the ABI derives from its position as the representative body for the whole banking system. In particular, the ABI is responsible for coordinating interbank agreements and fixing uniform operational and accounting methods in interbank relations, promoting the widest possible participation of banks in interbank initiatives - in concert with the Banca d'Italia - and disseminating information.

In addition, new bodies have been created to develop joint projects and manage services of common interest:

- the **Interbank Society for Automation (SIA)**, which provides services and infrastructures of common interest to the banking system and, if necessary, operational support for the payment activities of the central bank. The Banca d'Italia holds 40% of its capital and another 40% is held by the Italian Bankers' Association. The restructuring plan for the interbank network, launched in 1991, clearly defines the SIA's role of "public utility". The plan distinguished between activities to be coordinated and managed by a single agent and those for which full competition among eligible providers is appropriate; the former activities were assigned to the SIA. According to the plan, the SIA has exclusive responsibility for running the national network for data transmission (RNI) - which in the past consisted of a number of separate category-wide networks (i.e. networks of savings banks and rural and cooperative banks, etc.) interconnected through the SIA network - and for managing procedures of general interest, such as clearing procedures, on behalf of the Banca d'Italia. By contrast, the SIA no longer provides services which are not of general concern to the banking system; at present, central credit institutions and their service companies - which in the past managed category-wide networks - act as application centres supplying competitive services based on the national interbank network. Any operators connected with the interbank network may act as providers of competitive services;
- **Società Monte Titoli**, a company that provides custody and administration of transferable securities. In particular, Monte Titoli offers centralised management services for all securities except government securities, which are centralised at the Banca d'Italia. Its shareholders include the Banca d'Italia, all banks and stockbrokers and securities investment firms. The Banca d'Italia is entitled to appoint one member to the Board of Directors. The law allows shareholders to sell their shares only to the Banca d'Italia, which is the only shareholder allowed to hold more than 7% of the company's capital.

## 2. PAYMENT MEDIA USED BY NON-BANKS

### 2.1 Cash payments

The legal tender in circulation consists of banknotes in six denominations issued by the Banca d'Italia (Lit. 1,000, 2,000, 5,000, 10,000, 50,000 and 100,000) and coin in eight denominations issued by the Treasury.

At the end of 1992 the ratio of the stock of currency in circulation to GDP was 5.7%. Notes and coin in circulation accounted for 15.7% of the money supply ($M_1$) in 1992. Certain structural and institutional factors favour the continuing widespread use of cash in Italy. The former include the fragmented nature of the country's distributive trades and the configuration of its labour market, while the latter include the still widespread practice of paying wages and salaries in cash.

Payment system developments are affecting the use of cash in contradictory ways. On the one hand, the growth of bank current accounts, fuelled in part by increasing recourse to direct payroll credit transfers, has led to greater use of bank payment services; on the other hand, the spread of automated teller machines has been accompanied by an increase in the number and value of cash withdrawals from current accounts.

With a view to preventing money laundering, Law 197/1991 requires payments over Lit. 20 million to be made through authorised intermediaries or by means of instruments that permit the counterparties to be identified.

### *2.1.1 Other liabilities issued by the Banca d'Italia*

The Banca d'Italia issues cashier's cheques for amounts of between Lit. 50,000 and 500 million against cash payments of the corresponding amount. They are cashable at any bank branch, including branches of the central bank, and may be used for making payments to the central government and at post offices. The use of these instruments is limited, in practice, to certain non-recurring payments carried out by the central bank on behalf of public entities (tax refunds and the disbursement of severance pays to central government employees). In 1992 the Banca d'Italia issued over 5 million cashier's cheques for a total of Lit. 28,180 billion.

## 2.2 Non-cash payments

In Italy the banking system is the main provider of payment services: bank instruments account approximately for 90% of the amount and 70% of the volume of non-cash payments.[8] Cheques and banker's drafts, overall, are the most commonly used bank instruments, even though their importance is declining.

Bank current accounts bear interest and are therefore not only transaction accounts but also a traditional form of financial investment. Over the last few years, however, sight deposits have increasingly been held for transaction purposes. The number of bank current accounts per capita rose from 0.36 in 1988 to 0.41 in 1992.

The Postal Administration plays an important role in the field of retail payments, handling over 25% of the total number of payments. Postal current accounts represent an efficient channel for making and receiving low-value payments but bear only negligible interest. Therefore they are held for transaction purposes mainly by agencies providing services or paying pensions and annuities. The use of postal current accounts by households to hold liquid balances or make transactions is negligible. At the end of 1992 there were about 450,000 postal current accounts, with no significant change over the preceding years.

Payment cards account for only about 4% of the number of payments. However, in recent years their number and use has increased.

### *2.2.1 Bank cheques and banker's drafts*

In 1992, 633 million bank cheques (including banker's drafts),[9] totalling Lit. 1,887 trillion (US$ 1,530 billion), were drawn on bank customers' current accounts. Since 1990 the use of cheques has declined slightly as a result of the increasing use of credit transfers by corporations, cash withdrawals at ATMs and payment cards by families.

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8 Data on bank instruments are taken from a sample group of seventy-five banks accounting for approximately 80% of the banking system's sight deposits.

9 Banker's drafts are drawn by a bank on itself and are similar to traveller's cheques. They are issued solely by specially authorised banks against amounts deposited in cash at the time of issue or debited to the applicant's account.

In view of the relevance of cheques in the Italian payment system, in recent years the Banca d'Italia has promoted a revision of the interbank circuit for the exchange of cheques aimed at channelling all these instruments through the clearing system. The initiatives have focused on out-of-town cheques, which in the past were exchanged and settled through bilateral procedures.[10] As a result of these initiatives, in 1992 90% of out-of-town cheques were exchanged through the clearing system.

At present, local cheques and large-value (over Lit. 2 million) out-of-town cheques[11] are physically exchanged through the clearing houses (Recapiti locale) and settled in central bank money on the same day. The stipulation of a maximum period for returning cheques (two working days for local cheques and seven for out-of-town cheques) enables banks to release funds to customers in three to four days for local cheques and nine to ten days for out-of-town items.

Low-value cheques (up to Lit. 2 million) and banker's drafts (up to Lit. 20 million) are handled through a cheque truncation procedure, implemented in 1990, that replaces the physical delivery of instruments with the exchange of electronic interbank messages. Data pertaining to low-value truncated cheques are conveyed through the national interbank network (RNI) at night (day D) and are settled through the clearing system the following day (D+1). Unpaid cheques must be returned within three days (D+4). Correct application of the procedure should enable the banking system to make significant improvements in cheque management and improve the quality of service to customers. Since February 1992, the entire banking system has participated in the cheque truncation procedure.

Other initiatives aimed at increasing the volume of cheques exchanged through the clearing system and at further reducing payment execution times are under way. Under an interbank agreement promoted by the Italian Bankers' Association in April 1993 banks are required to exchange all cheques and banker's drafts through the clearing system. On the technical front, an electronic procedure for the prompt notification of cheques' status is under study.

Law 386 of 15th December 1990 introduced new rules for cheques. In particular, it lays down that, in the event of a protest or equivalent declaration regarding cheques drawn against insufficient funds, the drawee bank must revoke the drawer's authorisation to issue cheques for a defined period.

### *2.2.2 Credit transfers*

Bank credit transfers are less widely used than cheques but involve larger values: in 1992, 172 million credit transfers, totalling Lit. 4,300 trillion (US$ 3,500 billion), were executed.

Bank credit transfers are becoming a commonly used instrument throughout the economy, even for retail transactions; enterprises are the main users and households the main beneficiaries, receiving about 70% of these payments (e.g. direct crediting of wages and salaries).

The growth of credit transfers has prompted banks to develop automated management techniques with a view to reducing the volume of paper-based media generated by the conventional processing of these operations. Banks have pursued this objective by reaching agreements with their customers for bulk payment and collection instructions (i.e. crediting of wages and salaries, collection of utility bills, etc.) to be transmitted on electronic rather than paper media and by setting up automated systems for the interbank exchange of these transactions.

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10 In the past only local cheques were exchanged through the clearing system. Out-of-town cheques were exchanged by mail and settled on reciprocal accounts held by banks on a bilateral basis, resulting in long delay between the drawing of a cheque and the funds being made available to the final customer.

11 The procedure for the exchange of out-of-town cheques through the clearing houses was launched in 1988. It provides for the exchange of cheques in a clearing house of which both the collecting and the drawee banks are members, designated by bilateral convention. Banks not participating in the clearing or not members of the same clearing house can participate indirectly by way of interbank correspondent mandates.

At present, the transmission of bulk payment instructions by businesses to the banking system is based largely on the delivery of magnetic media; the transmission of payment instructions through telematic links is less widespread. In this regard, the lack of common standards represents a major issue since businesses usually hold accounts with a number of banks. Initiatives aimed at establishing common standards have recently been promoted by the Confindustria and the Italian Bankers' Association (see Section 2.3).

Only large-value credit transfers (i.e. exceeding Lit. 500 million) are exchanged through the clearing system. Low-value credit transfers are exchanged between banks mainly through a procedure based on the national interbank network (RNI) and are settled by debiting and crediting banks' correspondent accounts; the use of this procedure has been fostered by the application in 1993 of additional interbank fees on credit transfers sent by mail.

The Banca d'Italia has promoted a series of initiatives to rationalise the exchange and settlement of credit transfers. These aim to:

- establish predetermined procedures and timetables governing interbank transactions, with the balances generated by all credit transfer transactions being settled on banks' accounts with the central bank;
- ensure greater transparency for customers as regards the time taken to execute transactions and the related costs.

Against this background, at the beginning of 1992 the Banca d'Italia and the CIPA promoted a "fast lane" for credit transfers in which banks may voluntarily participate. Member banks undertake to execute credit transfers within strict time limits (one day for urgent credit transfers, four days for ordinary ones) and are required to refund transaction commissions to customers when the time limits are exceeded. Furthermore, two new specific procedures are in the pipeline to provide for the exchange of credit transfers through the clearing system: one will handle large-value and external lira credit transfers and be a part of the SIPS sub-system; the other will handle low-value credit transfers through the Retail sub-system (see Sections 3.1 and 3.2.3).

### *2.2.3 Direct debits, bills of exchange and bank receipts*

Direct debits, executed through preauthorised debits of current accounts, totalled 69 million in 1992. They are used by firms mainly to collect recurrent low-value payments (i.e. utility bills). The limited use of these procedures reflects the widespread recourse to postal procedures for the collection of regular bills. However, over the period 1988-92 the number of direct debits increased at a yearly average rate of 20%.

Furthermore, the banking system is highly involved in the management of bills of exchange and paper-based or electronic bank receipts (RIBA), which are widely used by companies to collect trade credits. In 1992 approximately 72 million commercial bills and paper-based bank receipts and 96 million electronic bank receipts were collected through the banking system; the share of RIBA increased from 38% in 1989 to 55% in 1992.

The RIBA procedure is initiated by the creditor, who delivers the collection orders through a magnetic tape to his bank; the collection orders are transmitted, via the interbank network, to the debtor's bank, which sends an advice to the customer. RIBA are generally settled by debiting the current account of the debtor with each single transaction individually authorised. Unpaid receipts are returned to the creditor in electronic form within a given time limit.

A procedure based upon the interbank network (RNI) was made available in 1991 in response to the need of firms to rationalise and reduce the cost of their transactions with the banking system. It enables individual firms to transmit direct debits and RIBA to various collecting banks through a single institution which acts as centralising agent. Any user directly linked to the national interbank network (banks, SIA, application centres) is eligible to act as a centralising agent.

Since September 1992 the interbank exchange of direct debits and electronic bank receipts has been carried out through the national clearing system (Retail sub-system).

### *2.2.4 Payment cards*

Growing competition among suppliers of payment services and the steady change in consumers' habits have increased both the number and the use of payment cards.

At the end of 1992 5.4 million credit cards issued either by banks or by non-bank companies (travel and entertainment cards) were in circulation. Over the last few years bank credit cards have rapidly increased their market share; they are issued both by individual banks and, on a cooperative basis, by a company (Servizi Interbancari) in which 675 Italian banks are shareholders and, unlike T&E cards, they are also offered to low-income customers.

At the end of 1992 there were 13.7 million cash and debit cards in circulation for use at POS terminals and ATMs. These cards are mainly issued by the banking system.

Over the period 1988-92 the volume of cash withdrawals at ATMs has increased at an yearly average rate of 25%. This trend was enhanced by the spread of ATMs, which numbered 14,000 at the end of 1992; the ratio of ATMs to traditional bank branches rose from 0.37 in 1988 to 0.7 in 1992. Almost 90% of ATMs are linked through the nationwide network (Bancomat). Bancomat card holders may withdraw cash from any ATM in the network. All banks established in Italy that can comply with the Bancomat system's rules are eligible for membership.

The number of POS has also grown rapidly: at the end of 1992 there were 62,000 POS terminals compared with 4,360 at the end of 1988. However, the use of POS is not widespread; in 1992 only 12.7 million payments were effected by debit cards at POS.

A number of fidelity cards have been promoted by retail chains, either directly or through financial firms that handle consumer credit operations, although this type of card is still not very widespread. In addition, prepaid cards have been issued by the public telephone and motorways management companies.

### *2.2.5 Postal instruments*

The Postal Administration provides three payment services in connection with postal current accounts and a cash transfer service (money orders).

Services connected with postal current accounts include: in-payments to current accounts, postal giro transfers and current account cheques. These payment operations are increasingly processed via computer networks in real time.

In-payments to postal current accounts are widely used by businesses and utility companies to collect retail payments and regular bills; they totalled more than 620 million in 1992. A printed form, prepared for optical scanning, is sent to the debtor, who may effect the payment at any post office by cash, cashier's cheques or banker's drafts; bank cheques are not accepted. On the whole, transmission times for funds and accounting data are short: funds deposited in another town become available after three days.

In 1992 some 36 million postal cheques were issued. They are mainly used by businesses and social security institutions to pay pensions and annuities; they are also used to transfer balances held on postal current accounts to the banking system. Postal giro transfers account for only 2% of the overall volume of payments handled by the Postal Administration; by contrast, they represent over 20% in terms of value.

Money orders are generally used to remit funds to individuals who are not holders of a postal current account. They are issued against payment of the amount in cash and sent to the post office nearest the beneficiary's home. In 1992 some 20.7 million money orders were issued.

In recent years several steps have been taken to increase the integration of the postal and banking circuits. In 1990 the Postal Administration's membership of the clearing houses operated by the Banca d'Italia was finalised. Furthermore an ad hoc coordinating committee of representatives of the Postal Administration, the Italian Bankers' Association and the Banca d'Italia was set up in 1990 to study ways of achieving the full mutual acceptability of payment instruments and intercircuit standardisation of instruments and services (i.e. acceptance of bank cheques in payments executed at post offices, interoperability of postal and bank payment cards and interconnection between the postal and bank networks).

The process of denationalisation of the Postal Administration, started in September 1993, will transform the Postal Administration into a company limited by shares in three years. This change in legal status will likely enable it to overcome the present regulatory constraints on its activity in the field of payment services.

### 2.3 Recent developments

The study published by the Banca d'Italia in 1987 in its "White Paper on the Payment System in Italy" has served as a springboard for promoting the modernisation of the Italian payment system with a view to improving the payment services provided to final customers.

At the beginning of 1993, the reorganisation of cheque processing was almost finalised with the development of compulsory standard interbank procedures and increased use of information technology. A few initiatives pertaining to the interbank circuit of credit transfers are in the pipeline (see Section 2.2.2).

As the overhaul of the interbank circuits of payment instruments approaches completion, it is increasingly important to assess the effects of the new interbank procedures on the payment services provided to final customers. In 1993 the Banca d'Italia, through the CIPA, promoted initiatives aimed at checking whether payment execution times were in line with the faster processing times made possible by the new interbank procedures. In order to evaluate customers' needs, the Italian Bankers' Association has carried out two specific sample surveys addressed to households and businesses. Following the enactment of Law 154/1992 on transparency, the Italian Bankers' Association has also set up a banking Ombudsman with the task of examining customers' complaints.

Increasing attention is being paid to the needs of businesses in the payments field. The development of telematic links and the establishment of common standards are necessary to rationalise the information flows relating to bank statements and payment instructions between businesses and the banking system. A project promoted by the Italian Bankers' Association and the Confindustria envisages the gradual adoption of Edifact standards (Electronic Data Interchange for Administration, Commerce and Transport)[12] for payment instructions sent by businesses to banks and the resulting transactions exchanged between banks via the interbank network (RNI). In January 1993 the Banca d'Italia, the Italian Bankers' Association and the Confindustria set up an "observatory" on payment systems to study the needs of businesses in the field of payment services.

12 The EDIFACT project makes it possible to transfer, via telematic networks, standardised messages relating to the whole commercial cycle (buy and sell orders, billing, credit transfers, debit and credit notes).

# 3. INTERBANK EXCHANGE AND SETTLEMENT CIRCUITS

## 3.1 General overview

In Italy there are two main settlement systems, one gross and the other net; in both systems settlement is effected on the accounts that banks hold with the Banca d'Italia. Transactions can also be settled through bilateral interbank correspondent accounts, the so-called "unofficial" circuit, governed by bilateral agreements; balances of correspondent accounts are settled on the official circuit.

In recent years the Banca d'Italia has promoted a general reform of the clearing system and revised the system of centralised accounts to boost the efficiency of interbank circuits and foster daily settlement of interbank payments in central bank money.

The main changes in the payment field have been the following:

- the introduction of a procedure for the real-time execution of interbank transactions by the direct movement of funds on banks' centralised accounts held at the Banca d'Italia. In 1989 the real-time direct transfers on the centralised accounts (the Banca d'Italia continuous Settlement System - BISS) were initiated, allowing banks to transfer funds between these accounts via the national interbank network (RNI);
- the implementation of three new specialised clearing sub-systems: two for large-value funds transfers, the Interbank Payment System operated by the Interbank Society for Automation (SIPS) and the Electronic Memoranda (ME), and the third for the settlement of low-value payments (Retail sub-system);
- the automation of all the phases of the clearing cycle to enable participants to carry out transactions throughout the business day and obtain real-time information on preliminary balances, and the extensive use of the national interbank network for exchanging accounting data and information between operators;
- the creation of a screen-based market for interbank deposits (MID);[13] transactions in the MID are settled via the ME sub-system.

The aim was to increase the proportion of transactions settled immediately via accounts with the Banca d'Italia by bringing into the gross and net settlement systems transactions previously settled bilaterally. In 1992 the value of interbank payments settled through "official circuits" amounted to about Lit. 32,000 trillion (US$ 26,000 billion). During 1992 the volume of payments settled increased by 45% and the ratio of such flows to GDP rose to 22.1%, compared with 13.7% in 1990. The rapid growth of these transactions was essentially due to the clearing system, which accounted for 91% of payments settled at the central bank in 1992; the ratio between multilateral net balances and gross flows fell from 11.8% in 1989 to 8.3% in 1992 (Table 1). The measures taken to encourage settlement through the central bank have reduced the significance of "unofficial circuits": the average volume of deposits on banks' reciprocal accounts fell by 50% between 1988 and 1992.

The multilateral net settlement system is managed by the Banca d'Italia through the clearing houses. These were established by law in 1881 to provide facilities for the transfer of banknotes, the settlement of the resulting balances and the offsetting of other credit instruments. Under a law of 1926 the operation of clearing houses was entrusted exclusively to the Banca d'Italia.

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13 The screen-based interbank deposit market (MID) enables the exchange of information on the demand for and supply of interbank deposits, as well as the conclusion of the related contracts, to be completed electronically; it also ensures fairness and transparency in the formation of prices, which as a result better reflect real market conditions.

Table 1

**Clearing and settlement of interbank payments**

(in trillions of Italian lire)

| | Clearing system | | Settlement on centralised accounts with the central bank[1] (b) | Total transactions to be settled in monetary base (a+b)/GDP |
|---|---|---|---|---|
| | Gross flow (a) | Multilateral balances | | |
| 1988 | 4,892.3 | 810.3 | 1,307.1 | 5.7 |
| 1989 | 8,364.5 | 983.8 | 1,474.5 | 8.3 |
| 1990 | 16,240.7 | 1,286.2 | 1,634.4 | 13.7 |
| 1991 | 20,377.4 | 1,585.6 | 1,650.5 | 15.5 |
| 1992 | 29,053.0 | 2,411.4 | 3,004.4 | 22.1 |

[1] Transactions net of clearing balances.

The new automated clearing system came into operation in 1989 and consists of four sub-systems:

- the ME and SIPS sub-systems for large-value paperless transactions;
- the Retail sub-system for low-value paperless payments ("sottosistema Dettaglio");
- the Local clearing sub-system ("Recapiti locale") for paper-based operations.

The ME and the Local clearing sub-systems are operated directly by the Banca d'Italia. The SIPS and the Retail sub-systems, which are also owned by the Banca d'Italia, are managed by the Interbank Society for Automation (SIA) in the name and on behalf of the Banca d'Italia.

Large-value paperless transactions can be processed electronically, exchanged and settled via the SIPS and/or ME sub-systems. The former handles giro transfers of external lire[14] and the lira equivalent of foreign exchange transactions, which account for a very large portion of the total value of interbank payments in Italy, while the latter has been designed to allow banks to adjust their liquidity positions and to settle the screen-based market transactions for interbank deposits.

Low-value paperless payments are processed electronically through a number of procedures managed by service companies connected to the national interbank network. The main procedures relate to Bancomat withdrawals, truncated cheques, direct debits and Riba. Net bilateral balances resulting from each of these procedures are entered into the Retail sub-system for the determination of aggregate bilateral balances. In the near future other low-value payments (e.g. credit transfers) will be channelled into the system.

Paper-based transactions that necessitate the physical exchange of items (e.g. large-value cheques) are dealt with through the Local clearing system. All operators' paper-based transactions with the Banca d'Italia, the Treasury and the Postal Administration have to be exchanged and settled via this channel. Paper-based items can be exchanged through the clearing houses located in each

14 An external lira payment is any transfer of lira funds between economic agents resident in different countries. The concept of residence is defined in the exchange legislation.

Italian provincial capital. In December 1990, an automated procedure for data transmission was introduced.

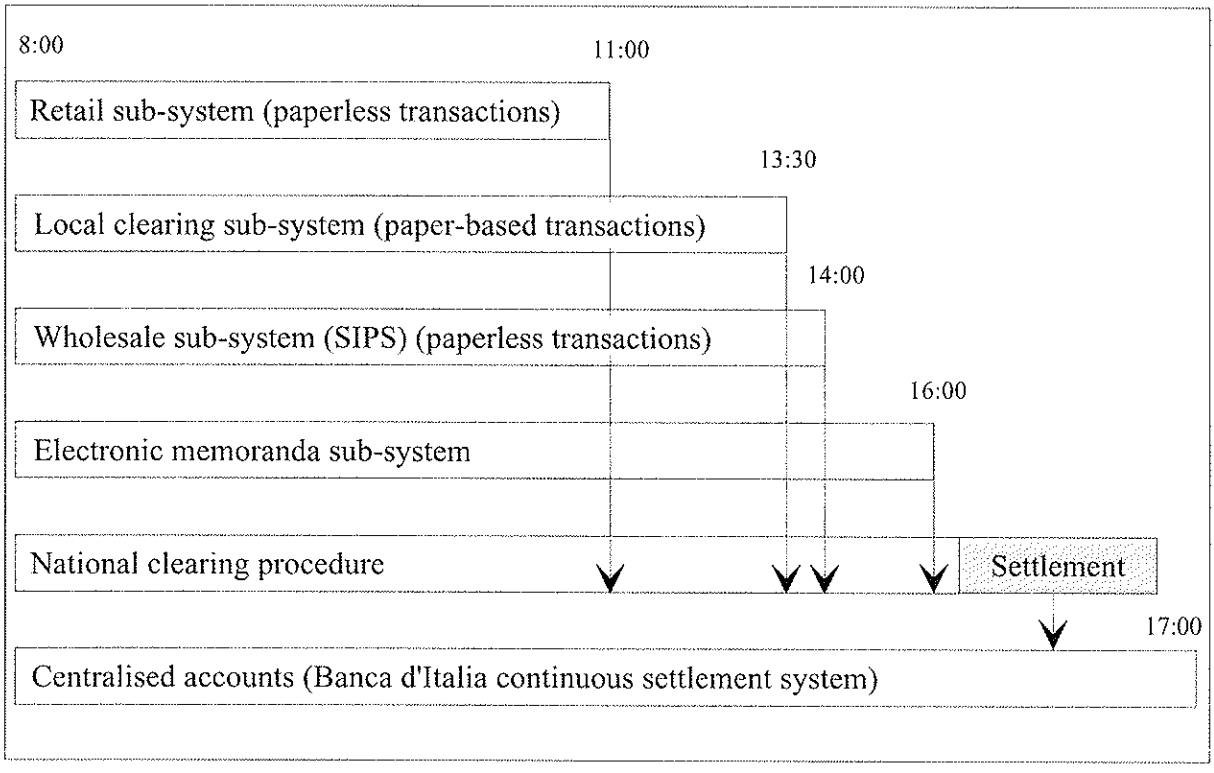
The sub-systems have different but coordinated operational hours and deadlines (see Chart 1): the first to close is the Retail system (at 11.00 a.m.), followed by the Local clearing system at 1.30 p.m. and SIPS at 2.00 p.m. Treasurers can subsequently cover their positions by using the ME sub-system, which is the last to close (at 4.00 p.m.). At 4.00 p.m. the automated national clearing procedure ("Compensazione nazionale dei recapiti") calculates a single multilateral net position at national level for each participant. The settlement of the multilateral net balances resulting from all the clearing sub-systems is effected through the banks' centralised accounts with the Banca d'Italia.

Access to the clearing system is strictly confined to deposit-taking institutions; in addition, the Banca d'Italia, on its own account and on the Treasury's behalf, and the Postal Administration participate in the system. Participation in the four sub-systems of the national clearing procedure varies; in general, the larger banks participate in all the clearing sub-systems, while smaller banks participate only in some, according to their operational needs. At the end of 1992, 106 banks participated in the SIPS, 148 in the Retail sub-system, 274 in the Local clearing sub-system and 292 in the ME sub-system. Indirect participation is currently provided for only in the Retail and Local clearing sub-systems; in the near future it will be extended to the SIPS.

On 7th May 1991 the Minister for the Treasury issued a Decree aimed at regulating participation in the clearing system and enhancing risk control by the central bank. The Decree empowered the Banca d'Italia to establish objective criteria for direct and indirect participants, such as solvency ratios and organisational standards. These criteria are still under study.

Chart 1

**The interbank clearing and settlement system in Italy**[1]




[1] Figures indicate opening and closing times of the various systems.

Both the clearing procedures and the Banca d'Italia continuous Settlement System use the national interbank network managed by the SIA.

## 3.2 Structure, operation and administration of major large-value systems

### *3.2.1 The Banca d'Italia continuous Settlement System (BISS)*

The centralised accounts held at the Banca d'Italia (see Section 5.2 for the structure of these accounts) may be mobilised for the execution of: interbank giro transfers, payments between banks and the Banca d'Italia or the Treasury, cash withdrawals and in-payments and the issuing of cheques.

The Banca d'Italia continuous Settlement System (BISS), launched in April 1989, allows banks to effect interbank giro transfers via the interbank network (RNI). However, interbank transfers continue to account for only a small share (3.5% in 1992) of the overall flows settled through the centralised accounts.

*(a) Regulations and participants*

The Banca d'Italia drafts regulations and policies for the BISS, monitors compliance and enforces the rules. Law 204/1910 governs advance accounts in general, while the Statutes and internal regulations of the Banca d'Italia govern their use.

Centralised accounts at the central bank may be opened by a wide range of institutions; however, the opening of an account requires the approval of the Banca d'Italia and is presently confined to credit institutions and specific public bodies; as of December 1992, 877 banks held centralised accounts at the Banca d'Italia and 379 participated directly in the BISS.

*(b) Types of transaction handled, operation and processing of transactions*

The BISS is used for interbank transactions requiring immediate settlement; electronic giros may be effected between 8.00 a.m. and 5.00 p.m.

Within the electronic direct transfer system, each transaction is entered by the paying bank; an automated procedure notifies the counterparties of the operation and the resulting balances on their accounts in real time. At the end of the working day the Banca d'Italia forwards an updated statement to each participant. The communications system consists of the electronic interbank network; security is ensured through authentication codes and encryption. Paper-based giro transfers are carried out through the branch network of the Banca d'Italia.

*(c) Settlement procedures, pricing policies and risk management*

The BISS provides instantaneous settlement of transactions. As each transfer is debited or credited immediately to the account of each counterparty, settlement is immediate and final. Once transactions have been posted to the centralised accounts they are irrevocable. A posted transaction cannot be cancelled; however, upon agreement between the parties concerned, a reverse transaction for the same amount and value date can be entered to offset an earlier transfer. The BISS does not allow intraday exposures to exceed the limits on ordinary advances.

To encourage the use of computerised procedures for the transfer of funds on centralised accounts the charges for paper-based operations are currently from three to six times higher than those for transactions carried out via the interbank network. Additional ad valorem charges are applied to transfers carried out after the closing of the ME sub-system to banks which would otherwise be unable to meet their settlement obligations in the clearing system (see Section 5.2.2).

The BISS cannot generate liquidity or credit risks, as each payment is irrevocable only if the paying bank has sufficient funds on its account with the Banca d'Italia. Currently, participants in the BISS are not subject to any special supervisory control beyond general bank supervision.

### *3.2.2 "Electronic Memoranda" sub-system (ME)*

*(a) Regulations and participants*

The ME sub-system was launched in July 1989 and substituted electronic messages for paper documents in large-value interbank payments.

The rules governing the ME sub-system are included in the national clearing regulations, which also fix the hours of operation and deadlines. The electronic clearing system operates from 8.00 a.m. to 4.00 p.m. five days a week.[15] At 4.00 p.m. final multilateral net balances are settled through the banks' centralised accounts at the Banca d'Italia.

As of December 1992, 292 banks participate in the system. On 1st January 1993 the Banca d'Italia also joined the system.

*(b) Types of transaction handled, operation and processing of transactions*

The ME sub-system is used mainly by banks to effect liquidity adjustments necessary to complete settlement of their final clearing balances. In October 1990 an automated procedure linked the ME to the interbank deposit market; the result was a large increase in the funds handled by the sub-system, amounting to Lit. 10,450 trillion in 1992. Since 1st January 1993 the cash balances resulting from securities settlement procedures have also been entered into the ME sub-system (see Section 4.2).

Banks may transmit data either via the interbank network or, in exceptional circumstances, via paper documents delivered to branches of the Banca d'Italia. Each transaction is entered by the debtor; however, the system notifies both counterparties of the operation and the resulting balances. Participants can also interrogate the system about their balance at any time. Multilateral net balances are settled through the centralised accounts at the close of clearing operations.

*(c) Settlement procedures, pricing policies and risk management*

The expenses of the clearing houses are met by participants on the basis of the value of transactions and the number of counterparties. The Banca d'Italia is in the process of restructuring the prices for the payment services it supplies (see Section 5.2.2).

Fixed charges are levied for each transaction; with a view to encouraging the use of computerised procedures, paper-based operations are charged at from three to six times the rate of those carried out via the interbank network.

A procedure has been introduced in the ME system for the real-time monitoring of intraday exposures. In addition, membership criteria will be redefined.

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15 At 6.00 a.m. funds transfers originated by MID transactions concluded during the preceding days are automatically channelled into the ME sub-system.

### *3.2.3 The Interbank Payment System operated by the SIA (SIPS)*

*(a) Regulations and participants*

The Interbank Payment System (SIPS) operated by the Interbank Society for Automation (SIA) in the name and on behalf of the Banca d'Italia came into operation on 17th July 1989. The system is owned by the Banca d'Italia, and handles interbank transfers of external lire and the lira settlement of foreign exchange transactions. Novated net balances deriving from the transactions handled by the SIPS are channelled through the national clearing procedure.

The Banca d'Italia establishes and enforces the rules for the operation of the SIPS and supervises the system. The basic framework for the operation of the SIPS is laid down in agreements between the Banca d'Italia and the SIA and between the SIA and the participants in the system. Membership rules are established directly by the Banca d'Italia, which may suspend or expel a participant from the system. SIPS transactions can be sent to the SIA EDP centre during the five days preceding the value date and up to 2.00 p.m. on the value date itself.

Any bank participating in the national clearing system and linked to the interbank network can apply for membership in the SIPS. Currently 106 banks participate in the system.

*(b) Types of transaction handled, operation and processing of transactions*

The SIPS adopts the "store and release" technique which allows each participant to make irrevocable ("release") a payment (previously entered or "stored") only after the funds necessary for its settlement have been made available by the operator originating the transaction.

The transmission of data in the SIPS is effected exclusively via the interbank network. There are four types of message: revocable payment prior notices, final credit transfers and confirmations of payment notices and cancellations of payment notices. At 2.00 p.m. on each working day the SIA notifies each participant of its position vis-à-vis each counterparty and simultaneously communicates the net balances to the Banca d'Italia for inclusion in the national clearing system.

The SIPS only processes electronic transactions. Information is stored in a data bank. By means of an inquiry sent to the SIPS data bank, each bank can receive updated information in real time concerning its payment prior notices as well as its balance.

In 1992 the transactions handled by the SIPS amounted to Lit. 11,995 trillion. The average value of SIPS transactions was Lit. 4.3 billion.

*(c) Settlement procedures, pricing policies and risk management*

The SIPS is a system in which novated bilateral net balances are settled through the national clearing system. Thus there is no actual transfer of funds until settlement time (i.e. the close of the clearing cycle at the end of each working day). The application of novation affects only bilateral net balances at the end of the day.

The costs of implementing the SIPS were covered by the Banca d'Italia. The SIPS pricing allows the full coverage of costs. The fee structure is also used to influence participants' behaviour. For instance, revocable notices, which provide advance information on banks' cash flow, have been kept free of charge.

The exposure of each bank is given by gross items during the operating cycle and by bilateral net balances at the end of it. The first line of defence against credit and liquidity risks is membership control. In the SIPS, as in the ME, membership criteria are fixed by the Banca d'Italia. Each participant can monitor his intraday exposures in real time. Other risk control measures, such as caps, are currently under study.

Although the SIPS is operated by the SIA, the Banca d'Italia regulates, supervises and oversees the system. However, neither SIPS participants nor the system as a whole are subject to any particular control beyond general supervision.

### 3.3 Main projects and policies being implemented

The efforts of the central bank and of the coordinating bodies in the payment field continue to focus on improving the functioning and stability of the system.

Initiatives are currently in progress to finalise the project providing for all interbank payments to be settled in central bank money. New procedures are under way for the exchange of large-value and foreign lira credit transfers through the SIPS. For low-value payments, additional types of transactions will be studied for systematic entry into the Retail sub-system. The use of correspondent accounts for the settlement of interbank transactions will thus be further reduced.

The formulation of an organic policy for the control of settlement risks is under study (see Section 5.4.1).

## 4. SPECIAL USE OF INTERBANK TRANSFER SYSTEMS FOR INTERNATIONAL AND DOMESTIC FINANCIAL TRANSACTIONS

### 4.1 Exchange and settlement systems for international transactions

The Italian banking system has strengthened its presence in the international markets over the last few years; this has been achieved mainly by expanding the activities of foreign branches, which grew in number from eighty-three at the end of 1988 to 104 at the end of 1992. Most of the growth occurred in Europe, where over 40% of all Italian banks' foreign branches are located. During the same period the number of Italian branches of foreign banks' decreased from sixty-two to fifty-two; at the same time foreign banks acquired majority or minority holdings in some Italian banks.

The late start of Italian intermediaries in the process of internationalisation has led to heavy dependence on interbank relations in their international business (only 23% of the liabilities of Italian banks' foreign branches represent claims of non-bank customers). The marked influence of interbank relations is the result of a wholesale-oriented strategy.

The main channel for transmitting information on cross-border payments is represented by the S.W.I.F.T. network. The telex system is now used mainly for contacts with countries that are not yet linked up to S.W.I.F.T. and as a back-up for the latter in the event of technical failure.

For international funds transfers banks rely on their correspondent network. The paying bank instructs a foreign correspondent to debit its foreign account and to transfer the amount to a correspondent of the credit bank for crediting to the latter's account. To carry out the instructions they receive, foreign banks use their local clearing and settlement systems.

Foreign exchange transactions can be split into two payment operations in different currencies. The settlement of the foreign currency leg of foreign exchange transactions between domestic banks does not differ from the general scheme described above, since Italy has no interbank system or sector-wide agreement for the clearing of foreign currencies. However, to prevent small sums from being handled individually, some major banks have decided to post credit and debit items that do not exceed an agreed limit to specially-created correspondent accounts on the understanding that the balances will be settled periodically or when they reach an agreed level by means of customary transfers on "nostro" accounts.

*4.1.1 Retail transactions*

The limitations that were imposed for many years by the Italian authorities on payments in foreign currencies or in lire executed abroad slowed down the spread of payment instruments specifically designed to carry out international retail transactions. More recently, exchange control liberalisation has produced significant changes, bringing Italy closer to other European countries with regard to the range of payment instruments available to customers and their use.

According to a survey carried out in 1993 on a sample group of 20 major Italian banks, the relevance of international payments by bank instruments is rather small if compared with internal payments: they account for approximately 2% of the number and 7% of the value of domestic payments.[16]

Cheques account for 55% of cross-border payments in number, but only for 2.2% in value. The use of guaranteed payment instruments, such as travellers' cheques, is particularly widespread; by contrast, recourse to bank cheques by residents for cross-border payments is still limited. The use of cheques may be given a substantial boost by the spread of the eurocheque card, issued by Italian banks since June 1989, that guarantees both cheques drawn on Italian banks and circulated within Italy and uniform eurocheques drawn on Italian banks and issued abroad.

Credit transfers are used mainly by businesses in "remote" payments to settle commercial and financial transactions; they account for 90% of the value and 37% of the number of cross-border payments. They are mainly handled by the S.W.I.F.T. network. Bills of exchange, collected through the banking system, and documentary credits are also used by businesses in international transactions.

Credit cards are increasingly used to make retail payments abroad. In 1992 around 22% of the transactions effected by means of credit cards issued in Italy were made abroad.

*4.1.2 Large-value transfers*

Large-value transfers in lire for the settlement between domestic institutions of international transactions are channelled through the SIPS or ME sub-systems (see Sections 3.2.2 and 3.2.3 for further details). While the ME sub-system is a general procedure for large-value transfers, the SIPS was set up specifically to handle interbank transfers of external lire and the settlement of the lira leg of foreign exchange transactions. Non-participating banks use the ME sub-system for transfers connected with international transactions.

Large-value transfers in other currencies are executed through correspondents. ECU transfers must be carried out through the intermediation of the ECU clearing banks.

## 4.2 Exchange and settlement systems for securities transactions

Since the beginning of the 1990s the configuration of the Italian securities markets and trading systems has profoundly changed mainly as a result of Law 1/1991, which contained provisions governing financial activity in general, created a new kind of operator (the securities investment firms - SIM for short) and laid down the legislative foundation for both derivative markets and the launch of trade guarantee systems. Furthermore, steps are being taken to make Italian securities settlement systems meet some of the standards established by the Group of Thirty.

At the end of 1992 the settlement of securities transactions was carried out mainly in the clearing houses through procedures known as "Liquidazioni titoli". The transactions settled include listed and unlisted securities and represent the final phase of contracts concluded on the stock

16 The survey considered all bank instruments except credit cards. The percentage shares of the various payment instruments are calculated as the average of payments to and from foreign countries.

exchange and over the counter. Equities, corporate bonds and government securities are all traded on the stock exchange; government securities are traded mainly on the screen-based market. In 1992 a market for futures in government securities and a Clearing and Guarantee House were set up; the functions of the Clearing and Guarantee House cover, under different forms, both the futures and the spot markets.

### *4.2.1 The stock market*

In Italy there are ten stock exchanges: Milan (which handles 95% of total transactions), Bologna, Florence, Genoa, Naples, Palermo, Rome, Turin, Trieste and Venice.

In November 1991 a continuous screen-based system was introduced for trading listed shares, managed by the electronic centre of the stock exchange (CED Borsa); it has permitted the creation of a single nationwide exchange. The screen-based system performs many auxiliary functions in addition to continuous trading, including the matching of automated daily trades, the processing of analytical data for the supervisory authorities and the public dissemination of information concerning the market. In September 1993 82 shares were traded on this system.

According to Law 1/1991, only securities investment firms and stockbrokers are authorised to trade shares directly on the stock exchange; commission dealers, admitted in the past, were allowed to trade up to the end of 1992. Furthermore, no more examinations for stockbrokers will be held, so this category of operators will disappear.

At present, the Italian stock market is generally a forward market; the stock exchange month runs from the middle of one month to the middle of the following; the settlement of transactions is deferred to the settlement day, which, as a rule, coincides with the last working day of the month. However, in October 1991, a resolution adopted by the Consob, in agreement with the Banca d'Italia, provided for all stock exchange trades to be spot transactions, with settlement on the third day following the trade (rolling settlement) and all securities transfers to be made exclusively via centralised depositories. This resolution also provided for the definition of forms of securities lending designed to cover possible shortfalls of securities at the close of settlement. The launch of the new trading procedure, originally scheduled for the beginning of 1993, had to be delayed until the beginning of 1994. In a first stage, the new procedure will handle only thinly-traded stocks and settlement will be carried out on the fifth day following the trade. The launch of derivative markets for shares will permit the extension of rolling settlement to marketable shares.

The Clearing and Guarantee House was set up in March 1992 with the task of ensuring the timely settlement of contracts concluded on both the cash and derivative markets, in line with the arrangements applying to similar organisations abroad. With particular regard to cash markets, the House now plays the role of guarantor just for the stock market. The House manages a special Guarantee Fund set up to handle the risk of default and guarantee finality of settlement on the date foreseen by the stock exchange calendar; this role does not involve any direct assumption of risk by the House. The Fund guarantees all the transactions carried out in listed shares and settled through monthly settlements; it is to be flanked by another system of trade guarantees once the rolling settlement becomes operational.

### *4.2.2 Screen-based market for government securities (MTS)*

The regulations governing the screen-based market for government securities are contained in a Ministerial Decree of February 1988 and a convention underwritten by participants. The market is open to the Banca d'Italia, banks and special credit institutions, securities investment firms, financial companies, insurance companies and investment fund management companies. The signatories to the convention operate as dealers; in October 1993 thirty-two of them acted as primary dealers; these are required to provide continuous "bid and offer" prices for contracts worth a minimum of Lit. 5 billion.

The working of the screen-based market is supervised by a management committee composed of representatives of the participating operators. Representatives of the Banca d'Italia and of the Companies and Stock Exchange Commission (Consob) can take part in the committee's meetings. The Banca d'Italia, acting as a dealer, publishes a daily list of trading prices and volumes. Trading is carried out electronically between dealers and primary dealers. Once a transaction is finalised, confirmation automatically appears on the purchaser's and seller's screens and printers, thus avoiding most of the problems connected with the matching of operations. The screen-based market operates between 9.00 a.m. and 5.00 p.m. on stock exchange business days.

Settlement for government securities is made on the third stock exchange working day following the conclusion of the contract. Treasury bill transactions are normally settled on the second working day after conclusion of the contract.

### *4.2.3 The futures market in government securities (MIF)*

The Italian futures market in government securities (MIF), established in a Ministerial Decree of 18th February 1992, became operational in September 1992. It is a screen-based market based on the circuit utilised for the government securities traded on the secondary market (MTS). The MIF is supervised by the same management committee as the MTS (see Section 4.2.2).

Intermediaries already operating in the MTS (banks, securities investment firms and investment funds) and specialised intermediaries (brokers and locals) are eligible to participate in the futures market. There are two categories of market participant: primary dealers, acting as market-makers, and other participants (dealers, brokers and locals). At present 154 operators participate in the market.

Final payment of contracts is ensured by the Clearing and Guarantee House. In the futures market the House acts as the central counterparty in every single transaction. Participants in the market can take part in the House as:

- general members, who can clear and settle transactions both for their own account and on behalf of third parties;
- individual members, who can clear and settle transactions only for their own account;
- indirect members, who can settle transactions only through the services of a general member.

### *4.2.4 Organisations involved in the securities settlement system*

The institutions involved in the settlement of securities transactions can be divided into two broad categories: those that set the rules and those engaged in managing and operating the system. An exception to this is represented by the Banca d'Italia, whose institutional role embraces both the regulatory and operational aspects (see Section 5.2).

The Consob is responsible for ensuring the transparency of the information given out in the financial market and each year establishes the stock exchange calendar.

The clearing and settlement of securities transactions are carried out through seven clearing houses managed by the Banca d'Italia. The clearing houses are interconnected by a procedure ("Interstanza") that enables operators to settle transactions with counterparties on different markets.

The Clearing and Guarantee House, entrusted with ensuring the timely settlement of the contracts concluded on both the cash and derivative markets, was set up as a company limited by shares, with a capital of 55 billion lire. It has 21 shareholders, credit institutions and securities investment firms that operate as primary dealers on the futures market.

As already mentioned in Section 4.2.1, in compliance with Law 1/1991 trading on the stock exchange is limited to securities investment firms and stockbrokers who are authorised to trade in listed securities for their own account and on behalf of third parties and must execute all orders on the exchange.

In March 1993 a total of 306 operators (108 securities investment firms, 69 stockbrokers and 126 credit institutions) took part in the clearing and settlement sessions through the clearing houses. Membership of the clearing houses allows operators to carry out all types of operation, from notifications to settlement; settlement in cash, however, must be carried out through a credit institution.

At present, the clearing houses provide three types of settlement: daily settlement is used mainly for government securities and corporate bond transactions, monthly settlement for shares, and extraordinary settlement for contracts relating to rights issues and unlisted securities. These settlement procedures, which differ only in their timing, apply equally to on-market and over-the-counter transactions and to listed and unlisted securities.

Data concerning bilateral positions are handled either by the national interbank network (see Section 3.1) or by CED Borsa, the electronic centre of the stock exchange that connects clearing houses to operators (stockbrokers and some banks) that do not have access to the national interbank network and would otherwise have to make independent arrangements to transmit data to the clearing houses.

The securities balances resulting from multilateral clearing are settled by way of book entries in the accounts opened at the two central depositories: Monte Titoli S.p.A. and the Banca d'Italia (see Chart 2).

### *4.2.5 Central depositories*

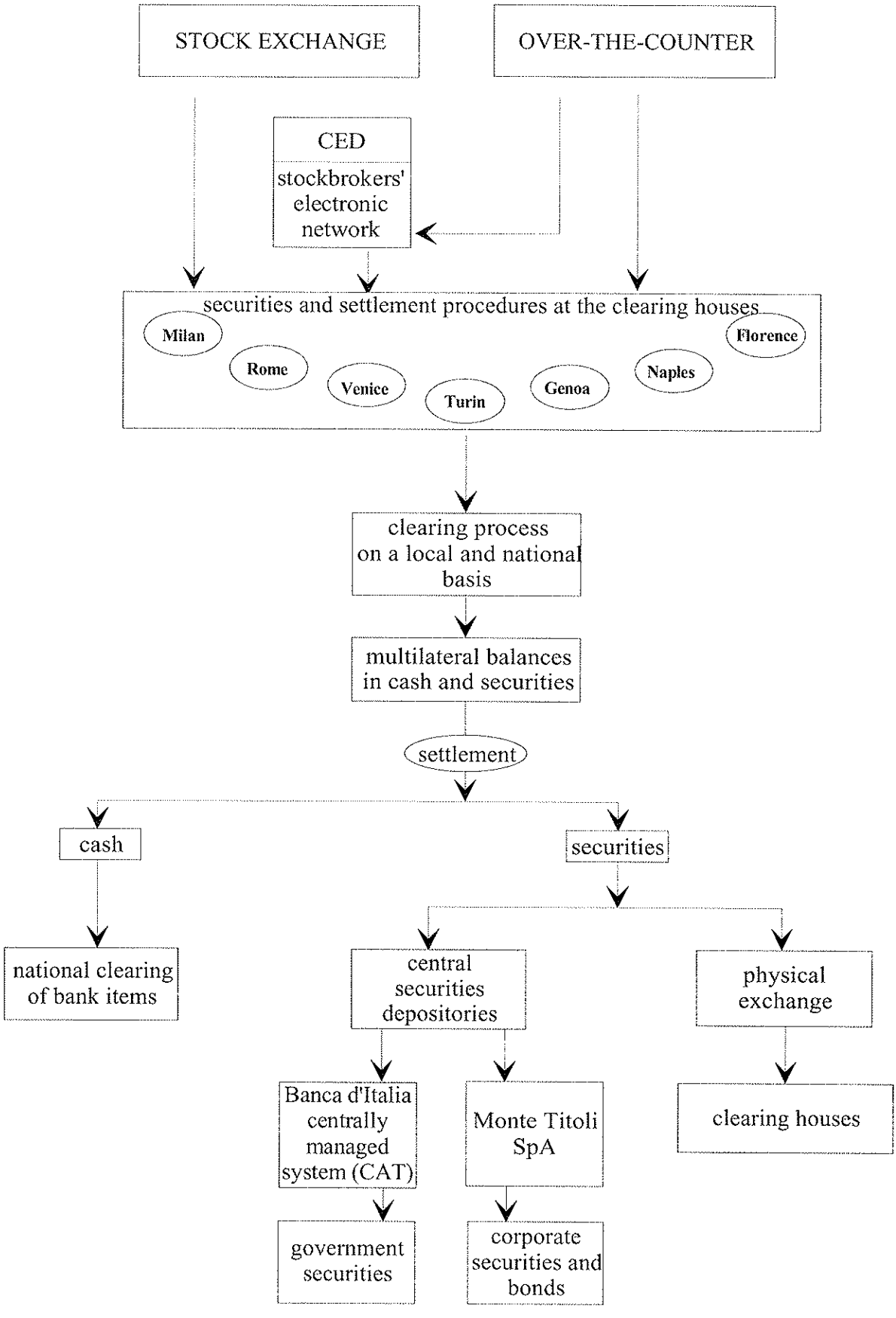
Monte Titoli S.p.A. runs the central depository for the shares and bonds of listed companies (see Section 1.4). The face value of certificates deposited with Monte Titoli (they are not dematerialised) is equal to 40% of all listed shares; the proportion rises to 85% for shares that are actually available for trading. In 1992 some 99% of clearing house debit balances relating to shares were settled on Monte Titoli accounts, thereby continuing the progress of centralisation. In the light of the positions adopted at the European Community level, Monte Titoli has been developing contacts with its counterparties abroad with a view to facilitating the processing of international securities transactions.

The Banca d'Italia has been administering the system for the centralised management of government securities since 1980. The system is linked to the clearing house settlement procedures; deposited securities are transferred between members of the system by means of book entries. In September 1990 a centralised securities accounts procedure (CAT) was introduced; this enables government securities to be transferred in real time by debiting and crediting participants' central accounts at the Banca d'Italia. The following institutions are eligible to participate in the system: banks and the Italian branches of foreign credit institutions, securities investment firms and stockbrokers, and international clearing institutions (CEDEL and Euroclear).

Applications are handled by the central bank. It is compulsory for participants in the clearing houses to maintain securities accounts with the Banca d'Italia.

Chart 2

**Securities clearing and settlement**



### *4.2.6 Structure, operation and administration of the clearing and settlement systems*

The duties of the clearing houses begin with the notification by each participant of its bilateral net positions in cash and securities. Bilateral balances are determined outside the clearing house through procedures that vary according to the nature of the counterparties. Notifications can be sent via the national interbank network, CED Borsa, or directly on magnetic tapes or paper-based documents. On their receipt, the clearing houses compute provisional balances, which are then checked and corrected by operators. Having eliminated any discrepancies, the clearing houses determine participants' multilateral positions in securities and cash through netting. The determination of multilateral balances does not involve the novation of underlying obligations.

The settlement procedure eliminates "capital risk" by applying the principle of delivery versus payment: clearing houses cannot settle credit balances in cash and securities until they have finalised the collection of all debit balances. On settlement day debit balances in securities are sent electronically to the central depository institutions and debited to participants' accounts. The physical delivery of certificates to the clearing house is used less and less to settle participants' balances. The cash settlement of securities transactions is carried out through the Local clearing system ("Recapiti locale"). Non-bank operators settle their balances through credit institutions. The final stage of the process is represented by the delivery of securities to the members with credit positions, by directly crediting their accounts with the central depositories.

Since September 1992, cases of insolvency in the stock market have been handled through the intervention of the Clearing and Guarantee House. Due to the length of the stock exchange month, a default may occur both during the settlement process and the trading period. The House intervenes in two different ways depending on the stage the default occurs. If an operator fails to settle his final balance with the Banca d'Italia's clearing house, the House settles on his behalf by drawing on the Guarantee Fund, utilising the deposit of the defaulting participant and, if necessary, also the contributions paid by the other operators. The operator's debt may be in cash and/or in securities. In the former case, the House simply pays the amount due to the clearing house; in the latter, the House buys (or rather borrows) the securities that the operator failed to deliver. Completion of settlement is thus ensured on the date foreseen by the stock exchange calendar. The House's intervention does not close the position of the operator in default; by law, this task is performed by the Stock Exchange Council, which reconstructs the original trades carried out by the defaulting operator, selling the securities he had bought and buying the ones he had sold (if the House has not already bought them), in order to determine the overall loss of the insolvency. Once the margins paid by the dafaulter have been subtracted, this is shared among all the participants in the Fund, regardless of whether they traded with the defaulter. The share of the loss is computed on the basis of the value of the trades settled in the monthly settlement in which the default occurred.

If an operator defaults before the start of the settlement process, the trades he has carried out are not entered into the monthly settlement, so that the House does not need to intervene directly. The Stock Exchange Council closes the contracts concluded by the defaulter and determines the individual losses of the counterparties. In a second phase the House covers the individual losses of the operators involved, determines the overall loss and shares it proportionally among the stockbrokers and securities firms participating in the Fund.

The value of securities handled through the settlement procedures increased by 35% in 1992 to reach Lit. 4,200 trillion, with that of government securities rising by 39% to account for 97% of the total; shares, warrants and options settlements totalled 2.7%, and bonds settlements 0.3%.

In 1992 the daily settlement procedure handled 97.4% of the total value, while the remaining 2.6% was handled through the monthly settlement procedure. This distribution reflects differences in the types of securities settled and in settlement methods. The clearing house settlement procedure handles over 90% of the trades in government securities, the remaining 10% being settled through direct transfers on the centralised securities accounts. At present, some 98% of government securities in circulation are deposited in such accounts.

## 5. THE ROLE OF THE CENTRAL BANK IN INTERBANK SETTLEMENT SYSTEMS

### 5.1 General responsibilities

The responsibilities of the Banca d'Italia in the settlement of interbank transactions derive from a series of laws and regulations:

- Decree Law of 6th May 1926 gives the central bank exclusive responsibility for managing the clearing system for both payments and securities (see Section 3.1);
- Law 204/1910 on the note issue and the Banca d'Italia's Statutes govern bank transactions executed by the Banca d'Italia;
- the 1993 Banking Code entrusts the Banca d'Italia with specific responsibilities and powers aimed at ensuring the smooth functioning of the payment system (see Sections 1.1 and 1.2).

The Bank's interest in the proper functioning of the payment system, and, in particular, of interbank circuits, stems also from its role in the implementation of monetary policy and as supervisor of the banking system.

Together with these specific responsibilities, the central bank encourages the establishment of common rules governing the exchange and settlement of interbank payments through its participation in the CIPA (Interbank Convention on Automation; see Section 1.3.3).

As the sole supplier of clearing and settlement facilities and in accordance with the 1993 Banking Code, the central bank is charged with ensuring the smooth functioning of the system and the control of credit and liquidity risks.

The regulations that apply to the banking system are aimed at strengthening the stability of interbank exchange and settlement systems. The specific control of payment system risk, which is currently carried out by monitoring banks' intraday exposures during the clearing process, will be reinforced through implementation of the measures envisaged in the Decree issued by the Minister of the Treasury on 7th May 1991. This enables the monetary authorities to regulate the participation of credit institutions in the clearing system on the basis of technical, organisational and capital standards. Furthermore, in the medium term the Banca d'Italia pursues a wider utilisation of the gross settlement system (BISS), which currently handles only a limited portion of interbank funds transfers (see Section 5.4.1).

Both the clearing system and the BISS use the national interbank network for the transmission of electronic data. Since it holds a significant shareholding in the SIA, the Banca d'Italia is in a position to prevent technical risks and ensure that payments processed electronically are executed efficiently.

### 5.2 Provision of settlement facilities

The Banca d'Italia has provided deposit accounts for the banking system since its foundation in 1893. They have traditionally been used both to facilitate interbank settlement (centralised accounts) and to manage compulsory reserves.

On 15th October 1990 changes in the system of compulsory reserves[17] led to changes in the configuration of banks' accounts with the Banca d'Italia. The centralised accounts now comprise

17 Under the new regulations banks may mobilise up to 7% of their compulsory reserves, provided that the average level for the period from the 15th of each month to the 14th of the next does not fall below the reserve requirement. In

both the reserve accounts for banks' compulsory reserves and for deposits held by banks not subject to reserve requirements, and ordinary advance accounts. The opening of an account is decided at the discretion of the Banca d'Italia and is de facto strictly confined to credit institutions and certain public bodies.

Under the new regulations the reserve account and that for ordinary advances are managed as a single account. Deposits are automatically used first to reduce the amount of any outstanding ordinary advances and the balance, if any, is credited to the reserve account; the order is reversed for withdrawals. However, banks may distribute their balances between the two sub-accounts at their discretion, in accordance with their planned cash management operations. In addition, banks receive daily information regarding their reserves.

As the only institution that can provide settlement facilities for interbank transactions, the Banca d'Italia regulates, manages and supervises the gross settlement system (see Section 3.2).

The central bank also manages clearing operations, supervises the system and draws up the operational rules, as well as providing netting services and acting as settlement agent (see Section 3.2).

The clearing houses are also responsible for the clearing and settlement of securities transactions. The legal responsibilities of the central bank embrace both the institutional aspects, such as regulating membership of the clearing system, and the operational aspects of the entire settlement procedure ("Liquidazione dei titoli").

The Banca d'Italia has traditionally encouraged and helped to organise the central administration of securities; it manages the centralised depository for government securities and participates, together with banks and stockbrokers, in the capital of Monte Titoli S.p.A., the depository for shares and bonds. In September 1990 a gross settlement system was established based on centralised securities account; it enables government securities to be traded in real time by debiting and crediting the individual participants' accounts at the Banca d'Italia. The new arrangement allows participants to settle transactions directly on these accounts (see Section 4.2).

### *5.2.1 Provision of credit facilities*

The Banca d'Italia can only supply the credit facilities expressly provided for by law. The facilities are governed by both Law 204/1910 and its Statutes.

There are two principal facilities designed to guarantee the closure of the clearing and the smooth functioning of the payment system: ordinary advances and fixed-term advances; both are fully collateralised. The Banca d'Italia makes ordinary or fixed-term advances to banks against collateral consisting of government or government-guaranteed securities of a face value equal to the amount of the facility, plus 15% in the case of government securities and 20% for government-backed paper.

Banks may resort freely to ordinary advances up to a specified amount; interest is normally charged at the discount rate, which is fixed by the Banca d'Italia.

Fixed-term advances are provided at the Banca d'Italia's discretion in response to individual banks' requests; they are intended to meet even large funding requirements, but for limited periods, and are thus of considerable importance for the regular functioning of the payment system. Interest is normally charged at the discount rate plus premiums that are also fixed by the Banca d'Italia. Furthermore, since December 1992 penalty interest rates have been applied to fixed-term advances granted after the closure of the Electronic Memorandum procedure to banks which would otherwise be unable to meet their settlement obligations in the national clearing procedure.

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addition, a bank's compulsory reserve may at no time be less than the reserve requirement minus the percentage that can be mobilised.

The central bank also offers a third credit facility, the discounting of bills of exchange, which, however, is not suitable for supporting the payment system. The discounting of bills of exchange used to be the main channel for refinancing, but has now lost much of its importance.

Since June 1992 the Banca d'Italia has been offering a liquidity facility for the ECU Clearing and Settlement System designed to assist the redistribution of liquidity between banks with credit balances and those with debit balances within the system (see the chapter on "Cross-border payment system arrangements", Section 3.4). Under this arrangement the Banca d'Italia manages a "pledged-out" account in securities (government securities or securities issued by international organisations, denominated in ECUs or in Italian lire), in the name and on behalf of the bank with a debit clearing balance (borrowing bank) to the order of the bank with a credit clearing balance (lending bank), as collateral for the overnight loan provided by the latter. In the event of failure to repay the loan, the securities deposited as collateral are transferred to the lending bank. If need be, upon request of the parties concerned, the Banca d'Italia may decide to purchase the collateral itself or find another purchaser.

### *5.2.2 Pricing policies*

Traditionally, the Banca d'Italia has not recovered either fixed costs or all of its personnel and data processing costs.

Charges, when applied, have been aimed at stimulating operators to use new procedures and increasing the efficiency of the payment system. These pricing criteria have been applied to both the procedures involving centralised accounts and the ME sub-system: to encourage the use of computerised procedures the charges for paper-based operations are currently six times higher than those for transactions carried out via the interbank network.

Since 1990 charges have also been imposed to penalise delays in the regular closure of clearing operations. Additional ad valorem charges have also been applied to transfers, carried out through the BISS after the closing of the ME sub-system, to banks which would otherwise be unable to meet their settlement obligations in the national clearing procedure; a new pricing schedule, to be enacted at the beginning of 1994, provides for ad valorem charges related to the delay from the closure of clearing operations.

At present, a thorough revision of the charges applied on all payment services provided by the Banca d'Italia is in progress, in line with the common guidelines established by EC central banks and tending to ensure the full recovery of costs.

## *5.3 Monetary policy and payment systems*

In recent years the Banca d'Italia has played a leading role in the drive to modernise and rationalise the payment system; the stability, smooth functioning and efficiency of the system are among the principal objectives pursued by the central bank.

The measures outlined in the foregoing sections have laid the foundation for improved customer services and enhanced systemic stability. They have also strengthened the link between the payment system and the management of monetary policy. Monetary policy regulates the supply of central bank money, which is used to make payments irrevocable and final. If banks settle a large portion of their payments on correspondent accounts, the pivotal role of central bank money is weakened. The result is a loss of security - since the finality of payments is ensured only through settlement in central bank money - and a narrowing of the base on which monetary policy can act.

The Banca d'Italia's actions have been aimed mainly at channelling the largest possible number of operations through the clearing and settlement systems, binding operators to standard rules of conduct and encouraging settlement in central bank money. Since the second half of 1989 the introduction of new procedures for clearing and settling interbank payments has had a profound

impact on the working of banks. An idea of how much has been achieved in recent years can be gained from the ratio between the payment flows settled via the central bank and GDP, which rose from 5.7% in 1988 to 22.1% in 1992.

The efforts to rationalise the payment system have been flanked by measures to enhance the efficiency of the financial markets and the management of banks' reserves. At the beginning of 1990 the interbank market was given added breadth and transparency by the introduction of the screen-based interbank deposit market (MID). Since October 1990 banks have been allowed to mobilise up to 3% of their compulsory reserves; the ceiling was raised to 5% in October 1991 and to 7% in February 1993. Mobilisation has strengthened the daily market for bank reserves, considerably reducing the volatility of short-term interest rates, which are therefore more reliable indicators of monetary policy.

The reforms have had a considerable impact on the procedures for conducting monetary policy and have enhanced the response of the financial markets to central bank policy action.

Specifically, the timing of market operations and of the various procedures for settling transactions has acquired greater significance in intermediaries' financial operations and in the conduct of monetary policy. The Banca d'Italia intervenes in the money market, at its discretion and on a daily basis, through open market operations and refinancing (fixed-term advances). These operations are designed to control bank reserves by influencing short-term interest rates. Transactions are settled on the same day on the centralised accounts held by the banks with the central bank, either directly or through the clearing system.

The central bank's interventions in the open market, which determine the overall liquidity of the system, are concentrated in the early hours of the morning; the rest of the morning is devoted to market transactions and clearing operations. The retail sub-system is the first to close, at 11.00 a.m., followed by that for local items at 1.30 p.m. and the SIPS sub-system at 2.00 p.m. Since all banks can monitor their clearing positions up to that time, they can continue trading on the interbank market to adjust their liquidity positions until 4.00 p.m., when the ME sub-system and the national clearing close. Refinancing operations via fixed-term advances are usually carried out towards the end of the working day, while banks can continue to transfer funds directly to their reserve and advance accounts, which are closed one hour after the deadline for clearing (see Chart 1).

The increased breadth and efficiency of the money market have enhanced the significance of short-term interest rates, which are quicker to respond to open market and refinancing operations. The ensuing increase in the operational efficiency of the financial system has tightened the links between the payment system, the money and financial markets and monetary policy. Every action by the central bank that gives rise to an accounting operation with the banking system is at the same time the completion of a payment and an act of monetary policy.

## 5.4 Main projects and policies being implemented

### *5.4.1 Risk management policy*

With regard to the domestic payment system, the most important issue being studied is the formulation of a policy for the control of credit and liquidity risks.

Medium-term initiatives must be distinguished from the measures already adopted or still under study within the present configuration of the clearing system.

In the medium term, the Banca d'Italia pursues a wider utilisation of the gross settlement system (BISS), through which only a minor portion of interbank funds transfers is presently settled. A thorough overhaul of the BISS is required to achieve this goal. First, it will be necessary to supply more flexible instruments in order to cover intraday imbalances of banks' treasuries. Accordingly, a Treasury Minister Decree issued on 5th February 1993 empowered the Banca d'Italia to extend the

intraday use of the compulsory reserves beyond the limit of the mobilising margin, which currently amounts to 7% of the reserve requirement. Second, it will be necessary to provide banks with new information and operational facilities, such as pending queues. These changes, however, will have to be carried out gradually in order to minimise the impact on banks' operating procedures.

Within the present configuration of the clearing system, the Banca d'Italia has promoted regulatory and operational changes aimed at minimising the possibility of crises. At the regulatory level, the Treasury Minister Decree of 7th May 1991 empowered the Banca d'Italia to set rules governing banks' access to the clearing system (see Section 3.1).

At the operating level, the risk control measures currently adopted provide for the monitoring of participants' intraday exposures by the Banca d'Italia during the final stage of the operational day. Furthermore, the Banca d'Italia has often alerted participants to the risks inherent in the high debit balances that occur during the clearing process, highlighting the importance of cooperation between the central bank and operators in the management of risks.

In 1992, the Management Committee of the screen-based market for interbank deposits (MID) set up a working group to identify measures for the control of banks' exposures on this market. In three years of activity the MID has recorded a considerable growth. At present, over 90% of the transactions carried out in the MID are settled via the Electronic Memoranda sub-system. The potential risks in this market - which is thoroughly self-regulated - have considerably increased, thus weakening the stability of the interbank payment system. With a view to meeting these new needs, the Management Committee - in concert with the Banca d'Italia - has formulated proposals for the monitoring and control of risks.

These proposals - recently approved by the General Meeting of market participants - focus on risk control during the trading phase and are intended to ensure the overall stability of the market and prevent risks that arise in the trading stage from being shifted to the settlement phase. In particular, they provide for:

- the real-time monitoring of each participant's debit position on the basis of special indicators, which will be shown on operators' monitors;
- the identification of common standards for the assessment of each participant's risk category in order to determine break-even points for the indicators.

The project for the monitoring and control of risks in the MID safeguards the principle of self-regulation and fosters cooperation between the central bank and operators with the aim of minimising the cost of risk control measures. Close cooperation seems to be the most efficient solution to this very delicate issue.

With a view to ensuring the settlement of debit positions, further controls over participants' observance of limits may eventually be introduced; in addition, penalties might be established by the self-regulatory body related to the frequency and extent of violations.

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Table 1

**Basic statistical data**

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Population (millions): | | | | | |
| *year-end*[1] ..... | *57.5* | *57.6* | *57.7* | *56.8* | *56.9* |
| GDP (ITL billions) ..... | 1,091,837 | 1,193,462 | 1,312,066 | 1,426,580 | 1,507,190 |
| GDP per capita (ITL millions) ..... | 19.0 | 20.7 | 22.7 | 25.1 | 26.5 |
| Exchange rate (domestic currency vis-à-vis USD): | | | | | |
| *year-end* ..... | *1,305.8* | *1,270.5* | *1,130.2* | *1,151.1* | *1,470.9* |
| *average* ..... | *1,302.9* | *1,373.6* | *1,198.4* | *1,241.6* | *1,232.3* |

[1] Since 1991 (year of the last census) the figures relating to population have been rectified.

Table 2

**Settlement media used by non-banks**

(at year-end, not seasonally adjusted, in billions of Italian lire)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Notes and coin ..... | 57,167 | 67,644 | 69,449 | 76,354 | 85,617 |
| Narrow money supply ($M_1$) ..... | 400,381 | 451,786 | 482,357 | 537,502 | 544,046 |
| Transferable deposits ..... | 331,015 | 365,461 | 395,840 | 441,719 | 442,418 |
| Other ..... | 12,199 | 18,681 | 17,068 | 19,429 | 16,011 |
| *Memorandum item:* | | | | | |
| Broad money supply ... | 663,850 | 738,395 | 801,991 | 878,104 | 920,026 |

Table 3

**Settlement media used by credit/deposit-taking institutions**

(at year-end, in billions of Italian lire)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Reserve balances held at central bank[1] ..... | 103,235 | 112,981 | 125,688 | 129,111 | 130,054 |
| *of which:* | | | | | |
| *required reserves* ..... | 102,898 | 112,465 | 125,491 | 128,915 | 129,927 |
| Transferable deposits at other institutions[2] ..... | 66,619 | 96,062 | 61,167 | 55,016 | 46,407 |
| *Memorandum item:* | | | | | |
| Institutions' borrowing from central bank[3] ..... | 1,923 | 2,149 | 2,305 | 1,134 | 1,235 |

[1] Since 1990 the data comprise average required reserves and average free reserves for the period 15th December - 14th January. [2] Sight interbank deposits and net balances of reciprocal accounts are included. [3] Since 1990 the data comprise institutions' average borrowing through ordinary advances for the period 15th December - 14th January.

Table 4

**Banknotes and coin**

(at year-end, not seasonally adjusted, in billions of Italian lire)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Total banknotes and coin outstanding ..... | 60,203 | 71,369 | 74,809 | 82,024 | 90,859 |
| Denomination of banknotes: | | | | | |
| *100,000 lire* ..... | *39,863* | *48,092* | *51,335* | *56,569* | *63,205* |
| *50,000 lire* ..... | *14,001* | *16,584* | *16,553* | *18,154* | *20,018* |
| *10,000 lire* ..... | *3,606* | *3,724* | *3,784* | *3,882* | *3,929* |
| *5,000 lire* ..... | *630* | *687* | *742* | *776* | *826* |
| *2,000 lire* ..... | *90* | *105* | *103* | *170* | *298* |
| *1,000 lire* ..... | *761* | *828* | *856* | *939* | *945* |
| Banknotes and coin held by credit institutions ..... | 3,036 | 3,725 | 5,360 | 5,670 | 5,242 |
| Total banknotes and coin outside credit institutions | 57,167 | 67,644 | 69,449 | 76,354 | 85,617 |

Table 5

**Institutional framework**

(at end-1992)

| Categories | Number of institutions | Number of branches | Number of accounts | Value of accounts (ITL billions) |
|---|---|---|---|---|
| Central bank ..... | 1 | 98 | - | - |
| Commercial banks ..... | 222 | 14,830 | 16,047 | 360,309 |
| Cooperative and rural banks ... | 802 | 5,959 | 8,403 | 70,964 |
| Postal Administration ..... | 1 | 14,412 | 450 | 8,533 |
| *Memorandum item:* | | | | |
| Branches of foreign banks | 40 | 52 | 8 | 461 |

Table 6

**Cash dispensers, ATMs and EFTPOS terminals**

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Cash dispensers and ATMs: | | | | | |
| *Number of networks* ..... | *1* | *1* | *1* | *1* | *1* |
| *Number of machines* ..... | *5,700* | *7,791* | *9,770* | *11,571* | *13,917* |
| *Volume of transactions (thousands)*[1] ..... | *62,995* | *80,067* | *100,663* | *131,283* | *162,583* |
| *Value of transactions*[1] *(ITL billions)*..... | *16,335* | *21,513* | *28,770* | *38,992* | *49,168* |
| EFTPOS: | | | | | |
| *Number of networks* ..... | . | . | . | . | . |
| *Number of terminals*[2] ..... | *4,360* | *10,240* | *22,185* | *45,711* | *62,251* |
| *Volume of transactions (thousands)*[1] ..... | *1,000* | *2,400* | *5,400* | *8,500* | *12,681* |
| *Value of transactions*[1] *(ITL billions)* ..... | *133* | *335* | *898* | *1,727* | *2,526* |

[1] Data relating to a sample group of 75 banks accounting for approximately 80% of current account deposits of the entire banking system. [2] Up to 1990 data relate to the sample group of banks described in footnote 1.

Table 7

**Number of payment cards in circulation**[1]

(in thousands)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Cards with a cash function[2] ..... | . | 7,385 | 9,398 | 11,083 | 13,673 |
| Cards with a debit/credit function ..... | . | 8,682 | 11,212 | 12,991 | 13,423 |
| *of which:* | | | | | |
| *cards with a debit function* ..... | . | *5,002* | *6,659* | *8,059* | *9,494* |
| *cards with a credit function* ..... | *2,949* | *3,680* | *4,553* | *4,932* | *5,364* |
| Cards with a cheque guarantee function[3] ..... | . | 1,808 | 1,942 | 2,323 | 2,187 |
| Retailer cards ..... | . | . | . | . | . |

[1] A card with multiple functions may appear in several categories. It is, therefore, not meaningful to add the figures. [2] Includes also eurocheque cards to be used at ATMs in Italy and abroad. [3] Eurocheque cards.

Table 8

**Payment instructions handled by selected payment systems: volume of transactions**

(in thousands)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Clearing sub-systems: | | | | | |
| Local clearing ..... | 206,353 | 360,400 | 442,689 | 440,125 | 292,129 |
| *of which:* | | | | | |
| *cheques*[1] ..... | *203,983* | *358,000* | *439,362* | *436,187* | *288,458* |
| *of which: out-of-town cheques* ..... | *18,412* | *191,870* | *238,135* | *222,395* | *96,062* |
| *bills of exchange*[1] ..... | *370* | *400* | *1,000* | *1,680* | *1,430* |
| *credit transfers*[2] ..... | - | - | - | - | *441* |
| *other items*[1,3] ..... | *2,000* | *2,000* | *2,327* | *2,258* | *1,800* |
| Electronic Memoranda[4] ... | - | 469 | 1,255 | 1,465 | 1,804 |
| *of which:* | | | | | |
| *interbank deposits* ..... | - | *77* | *411* | *722* | *1,020* |
| *foreign operations* ..... | - | *360* | *721* | *600* | *542* |
| *credit transfers* ..... | - | *9* | *34* | *64* | *147* |
| *other items* ..... | - | *23* | *89* | *79* | *95* |
| *paper items* ..... | - | - | | | |
| SIPS[5] ..... | - | 640 | 1,833 | 2,311 | 2,780 |
| Retail ..... | - | - | 46,641 | 125,086 | 361,783 |
| *of which:* | | | | | |
| *check truncation*[6] ..... | - | - | *13,006* | *79,162* | *317,970* |
| *Bancomat*[7] ..... | - | - | *33,635* | *45,924* | *43,813* |
| Centralised accounts ..... | 1,000 | 1,002 | 1,005 | 949 | 1,136 |
| *of which:* | | | | | |
| *payments between banks and Banca d'Italia/ Treasury*[8] ..... | *1,000* | *1,000* | *1,000* | *943* | *1,116* |
| *BISS*[9] ..... | - | *2* | *5* | *6* | *20* |

[1] Up to 1990 figures are estimated. [2] Up to 1991 credit transfers are included among the "other items". [3] Includes: clearing of securities transactions; payments between the banking system and the Treasury, the Banca d'Italia or the Postal Administration; credit transfers (up to 1991). [4] The Electronic Memoranda procedure was launched in July 1989. [5] Procedure launched in July 1989. [6] Procedure launched in March 1990. [7] Procedure launched in November 1989. [8] Debits/credits for the settlement of clearing balances are not included. [9] Procedure launched in April 1989.

Table 9

**Instructions handled by selected payment systems: value of transactions**

(in billions of Italian lire)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Clearing sub-systems: | | | | | |
| Local clearing ..... | 4,329,450 | 5,210,747 | 5,430,309 | 5,627,226 | 6,345,384 |
| *of which:* | | | | | |
| *cheques* ..... | *718,881* | *1,165,092* | *1,506,627* | *1,611,412* | *1,605,684* |
| *of which: out-of-town cheques* ..... | *45,275* | *489,345* | *646,889* | *643,187* | *606,197* |
| *bills of exchange* ..... | *9,286* | *10,582* | *19,835* | *48,715* | *45,193* |
| *credit transfers*[1] ..... | - | - | - | - | *1,024,169* |
| *other items*[2] ..... | *3,556,008* | *3,545,728* | *3,903,847* | *4,015,814* | *3,670,338* |
| Electronic Memoranda[3] ... | 304,118 | 1,434,396 | 5,148,000 | 6,332,000 | 10,450,000 |
| *of which:* | | | | | |
| *interbank deposits* ..... | - | *630,560* | *3,480,000* | *5,223,000* | *8,772,000* |
| *foreign operations* ..... | - | *524,603* | *1,014,000* | *553,000* | *782,000* |
| *credit transfers* ..... | - | *28,005* | *128,000* | *225,000* | *539,000* |
| *other items* ..... | - | *131,554* | *526,000* | *331,000* | *357,000* |
| *paper items* ..... | *304,118* | *119,674* | | | |
| SIPS[4] ..... | - | 1,718,800 | 5,647,324 | 8,273,530 | 11,994,531 |
| Retail ..... | - | 600 | 15,956 | 75,368 | 262,740 |
| *of which:* | | | | | |
| *check truncation*[5] ..... | - | - | *6,845* | *63,643* | *251,554* |
| *Bancomat*[6] ..... | - | *600* | *9,111* | *11,725* | *11,186* |
| Centralised accounts ..... | 1,307,100 | 1,474,525 | 1,634,400 | 1,650,500 | 2,873,100 |
| *of which:* | | | | | |
| *payments between banks and Banca d'Italia/ Treasury*[7] ..... | *1,307,100* | *1,456,000* | *1,608,900* | *1,613,700* | *2,775,000* |
| *BISS*[8] ..... | - | *18,525* | *25,500* | *36,800* | *98,100* |

[1] Up to 1991 credit transfers are included among the "other items". [2] Includes: clearing of securities transactions; payments between the banking system and the Treasury, the Banca d'Italia or the Postal Administration; credit transfers (up to 1991). [3] The Electronic Memoranda procedure was launched in July 1989. [4] Procedure launched in July 1989. [5] Procedure launched in March 1990. [6] Procedure launched in November 1989. [7] Debits/credits for the settlement of clearing balances are not included. [8] Procedure launched in April 1989.

Table 11

**Transfer instructions handled by securities settlement systems: value of transactions**

(in billions of Italian lire)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Securities Settlement Procedures: | 442,445 | 609,948 | 1,485,532 | 3,083,221 | 4,187,516 |
| *government securities* | *227,417* | *365,969* | *1,252,304* | *2,922,895* | *4,053,516* |
| *bonds* | *192,906* | *225,681* | *202,032* | *132,578* | *108,875* |
| *shares* | *22,122* | *18,298* | *31,196* | *27,748* | *25,125* |
| Government Securities Centralised Accounts (CAT)[1] | . | . | 330,418 | 324,599 | 327,168 |

[1] Procedure launched in September 1990. Net balances resulting from the Securities Settlement Procedures are not includefd.

Table 12

**Indicators of use of various cashless payment instruments: volume of transactions**[1]

(in millions)

| Instruments | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Cheques issued ..... | 667.5 | 688.9 | 729.7 | 689.3 | 674.5 |
| Payments by debit and credit cards ..... | 18.8 | 30.4 | 47.6 | 63.5 | 74.8 |
| Paper-based credit transfers ..... | 561.1 | 583.7 | 617.2 | 631.3 | 660.9 |
| *customer initiated*[2] ..... | *558.1* | *580.7* | *613.9* | *628.1* | *658.0* |
| *interbank/large-value* | *3.0* | *3.0* | *3.3* | *3.2* | *2.9* |
| Paperless credit transfers | 126.7 | 135.9 | 159.0 | 168.7 | 172.5 |
| *customer initiated* ..... | *126.7* | *134.8* | *155.9* | *164.9* | *167.9* |
| *interbank/large-value* | *0* | *1.1* | *3.1* | *3.8* | *4.6* |
| Direct debits ..... | 29.8 | 38.7 | 49.9 | 62.6 | 69.0 |
| Others ..... | 162.8 | 167.4 | 168.1 | 173.4 | 167.5 |
| *paperless collections*[3] | *50.0* | *63.9* | *76.7* | *86.6* | *95.7* |
| *paper-based collections*[4] ..... | *112.8* | *103.5* | *91.4* | *86.8* | *71.8* |
| **Total** ..... | 1,566.7 | 1,645.0 | 1,771.5 | 1,788.8 | 1,819.2 |

[1] The figures for payment operations effected by banking instruments have been provided by 75 banks accounting for approximately 80% of the current account deposits of the entire banking system. The data on the other payment operations (Banca d'Italia cashier's cheques, postal instruments, credit cards, interbank large-value transfers) relate to the entire system. [2] Customer initiated paper-based transfers include postal money orders and inpayments to postal current accounts that are processed automatically but originate from cash payments. [3] Collections of electronic bank receipts (RIBA). [4] Collections of bills of exchange and paper-based bank receipts.

Table 13

**Indicators of use of various cashless payment instruments: value of transactions**[1]

(in billions of Italian lire)

| Instruments | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Cheques issued ..... | 1,872,550 | 1,891,751 | 2,130,696 | 2,156,272 | 2,223,172 |
| Payments by debit and credit cards ..... | 3,476 | 5,730 | 8,635 | 11,754 | 14,291 |
| Paper-based credit transfers ..... | 5,739,369 | 5,676,688 | 6,161,729 | 6,330,688 | 7,191,203 |
| *customer initiated*[2] ..... | *572,143* | *555,286* | *648,982* | *701,174* | *745,865* |
| *interbank/large-value* | *5,167,226* | *5,121,402* | *5,512,747* | *5,629,514* | *6,445,338* |
| Paperless credit transfers | 2,299,050 | 5,795,539 | 14,245,811 | 18,227,933 | 26,236,791 |
| *customer initiated* ..... | *2,299,050* | *2,771,493* | *3,552,987* | *3,810,603* | *4,233,160* |
| *interbank/large-value* | *0* | *3,024,046* | *10,692,824* | *14,417,330* | *22,003,631* |
| Direct debits ..... | 27,415 | 34,417 | 46,787 | 61,619 | 73,741 |
| Others ..... | 338,415 | 383,789 | 432,347 | 462,658 | 468,069 |
| *paperless collections*[3] | *98,588* | *144,228* | *184,661* | *215,684* | *249,762* |
| *paper-based collections*[4] ..... | *239,827* | *239,561* | *247,686* | *246,974* | *218,307* |
| **Total** ..... | 10,280,275 | 13,787,914 | 23,026,005 | 27,250,924 | 36,207,267 |

[1] The figures for payment operations effected by banking instruments have been provided by 75 banks accounting for approximately 80% of the current account deposits of the entire banking system. The data on the other payment operations (Banca d'Italia cashier's cheques, postal instruments, credit cards, interbank large-value transfers) relate to the entire system. [2] Customer initiated paper-based transfers include postal money orders and inpayments to postal current accounts that are processed automatically but originate from cash payments. [3] Collections of electronic bank receipts (RIBA). [4] Collections of bills of exchange and paper-based bank receipts.

Table 14

**Participation in S.W.I.F.T. by domestic institutions**

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Members | 179 | 184 | 192 | 196 | 188 |
| *of which: live* | *172* | *171* | *188* | *190* | *186* |
| Sub-members[1] | 26 | 24 | 24 | 28 | 30 |
| *of which: live* | *26* | *23* | *22* | *24* | *30* |
| Participants[2] | 0 | 0 | 0 | 0 | 0 |
| *of which: live* | *0* | *0* | *0* | *0* | *0* |
| Total users | 205 | 208 | 216 | 224 | 218 |
| *of which: live* | *198* | *194* | *210* | *214* | *216* |
| *Memorandum items:* | | | | | |
| Total S.W.I.F.T.: | | | | | |
| *members* | *1,581* | *1,697* | *1,812* | *1,963* | *2,074* |
| *sub-members* | *1,228* | *1,315* | *1,469* | *1,607* | *1,738* |
| *participants* | *27* | *37* | *63* | *78* | *91* |
| *users* | *2,836* | *3,049* | *3,344* | *3,648* | *3,903* |

[1] Domestic users sponsored by members abroad. [2] Participants are not shareholders in S.W.I.F.T. and their message traffic over the network is restricted.

*Source:* S.W.I.F.T.

Table 15

**S.W.I.F.T. message flows to/from domestic users**[1]

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Total messages sent ..... | 16,262,220 | 17,266,969 | 18,188,905 | 19,203,007 | 21,144,390 |
| *of which:* | | | | | |
| *category I*[2] ..... | *4,667,877* | *5,181,772* | *5,852,557* | *6,110,992* | *6,695,298* |
| *category II*[3] ..... | *6,259,338* | *5,828,060* | *5,132,683* | *5,359,223* | *5,783,865* |
| *of which:* | | | | | |
| *sent/received to/from domestic users* ..... | *3,647,354* | *3,421,754* | *2,802,044* | *2,944,909* | *3,465,396* |
| Total messages received ..... | 15,758,658 | 16,603,267 | 16,973,327 | 18,148,442 | 20,008,765 |
| *of which:* | | | | | |
| *category I*[2] ..... | . | . | . | . | *6,101,945* |
| *category II*[3] ..... | . | . | . | . | *4,240,352* |
| *Memorandum item:* | | | | | |
| Global S.W.I.F.T. traffic .. | 255,142,610 | 298,780,982 | 332,895,932 | 365,159,291 | 405,540,962 |

[1] Source: S.W.I.F.T. [2] Category I: customer (funds) transfers. [3] Category II: bank (funds) transfers.

**Methodology and sources used for the compilation of Tables 12 and 13**

The figures provided in Tables 12 and 13 ("Indicators of use of various cashless payment instruments") relate to bank instruments, collections executed through the banking system, interbank payments, postal instruments and bank and travel and entertainment (T&E) credit cards.

Bank instruments and collections through the banking system:

- The figures for payment operations effected by bank instruments (bank cheques, bankers' drafts, debit cards used at EFTPOS terminals, credit transfers, preauthorised debits) and collections through the banking system (collections of electronic and paper-based bank receipts and bills of exchange) are taken from a sample group of seventy-five banks accounting for approximately 80% of the demand deposits of the entire banking system. Therefore, these statistics do not relate to the entire system, but they include, for the banks concerned, the transactions not cleared or settled through interbank arrangements ("on-us" items).
- The item "cheques issued" includes: bank cheques, bankers' drafts, Banca d'Italia cashier's cheques; cheques issued to withdraw cash are not included.
- The criterion adopted to distinguish between paperless and paper-based credit transfers refers to the procedures used by the banks to execute the payment orders.

Interbank transfers:

- Large value (paper-based and paperless) transfers include transfers of a purely interbank nature effected through the clearing and settlement systems. Transfers between the banking system and the Banca d'Italia or the Treasury are also included.

Postal instruments:

- The item "cheques issued" includes postal cheques.
- Postal money orders and inpayments on postal current accounts (made in cash or by banker's draft) are included in "paper-based credit transfers".
- Postal giro payments are considered as "paperless credit transfers".

Bank and T&E credit cards:

- The item "payments by credit card" comprises payment transactions effected in Italy and abroad by holders of bank and T&E credit cards issued in Italy.

# PAYMENT SYSTEMS IN JAPAN

# Table of contents

## INTRODUCTION

The most widely used means of payment in Japan are banknotes, coin, demand deposits at banks, postal deposits, and accounts held with the Bank of Japan (BOJ accounts). Outstanding balances of the above-mentioned five means of payment as of end-March 1992 were as follows: (i) banknotes - Yen 34.1 trillion (US$ 256.3 billion, 18.8% of the total); (ii) coin - Yen 3.4 trillion (US$ 25.6 billion, 1.9%); (iii) demand deposits at banks - Yen 128 trillion (US$ 962 billion, 70.6%); (iv) postal deposits - Yen 12.2 trillion (US$ 91.7 billion, 6.7%); and (v) BOJ accounts - Yen 3.6 trillion (US$ 27.1 billion, 2%).

The share of each with respect to the total volume and value of payments is not available because of the lack of accurate statistics covering the overall payment activities including those using banknotes and coin. However, it is roughly estimated that in terms of value, most of the payments are processed through demand deposits at banks and BOJ accounts, while in volume terms banknotes and coin have major shares.

The following three features are counted among specific characteristics of payment systems in Japan.

Firstly, banknotes and coin are, as mentioned above, the predominant retail payment instrument. Cheques are not popular in the personal sector, although they are widely used in the corporate sector. To meet the strong demand for cash, banks have installed a large number of cash dispensers (CDs) and automated teller machines (ATMs). MICS (Multi Integrated Cash Service) connects individual banks' networks of CD/ATMs to form the world's largest integrated CD/ATM network.

Secondly, direct debit/credit services are widely used. The "integrated account" service which links a demand deposit ("ordinary deposit"[1]) account with a time deposit account facilitates the direct debit service. If there are not sufficient funds in the demand deposit account, the shortage is automatically made up for by an overdraft collateralised by the time deposit. The direct debit service is widely used for payment of credit card bills and public utility charges, etc. The direct credit service is used for payment of salaries, dividends and pensions.

Thirdly, the government sector (particularly, the Post Office) is deeply involved in payment services. With a nationwide network (24,000 post offices versus 15,000 branches of banks), the Post Office provides payment services such as funds transfers, its CD/ATM network services, and direct debits and credits. These compete with payment services provided by the private banking sector.

## 1. INSTITUTIONAL ASPECTS

### 1.1 General legal aspects

In Japan, the following three categories of laws, although some of them may be classified into more than one category, constitute legal frameworks for payments: (i) laws which stipulate institutional aspects of financial institutions and permit the institutions to offer means of payment; this category includes the Bank of Japan Law of 1942, the Banking Law of 1981, the Long-term Credit Bank Law of 1952, etc.; (ii) laws which specify the way means of payment are offered and utilised; this category includes the Unit of Currency and Issue of Coins Law of 1988, the Bill Law of 1932, the Cheque Law of 1933, the Prepaid Card Law of 1989, etc.; funds transfers between postal accounts and

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1 "Ordinary deposits" are a type of demand deposits against which cheques are not to be drawn. Other types of demand deposits are deposits against which cheques are drawn, deposits for tax payments, etc. In this chapter, demand deposits mentioned in connection with the integrated account service are referred to as "ordinary deposits".

postal money orders are governed by the Postal Savings Law of 1947, the Postal Giro Law of 1948 and the Postal Money Order Law of 1948; (iii) laws which stipulate obligations between parties who utilise means of payment; at the core of this category are the Civil Code and the Commercial Code; contracts made between parties including rules of the privately-managed payment systems are also included in this category.

## 1.2 Institutions that provide payment services

### *1.2.1 Banking system*

Banks in Japan are classified as follows: (i) commercial banks; this category includes city banks, regional banks including members of the Second Association of Regional Banks (regional banks II), trust banks and long-term credit banks; (ii) foreign banks and foreign-owned trust banks in Japan; (iii) financial institutions that focus on lending to small businesses; this category includes Shinkin banks, the Shoko Chukin Bank, credit cooperatives and labour credit associations; (iv) financial institutions that concentrate on lending to agriculture and fishery; this category includes the Norinchukin Bank, agricultural cooperatives and fishery cooperatives; (v) government financial institutions which play a supplementary role in the banking industry; this category includes banks such as the Japan Development Bank, the Export-Import Bank of Japan, etc.

At end-April 1993 there were ten city banks, sixty-four regional banks, sixty-five regional banks II, seven trust banks, three long-term credit banks, ninety foreign banks, nine foreign-owned trust banks, 853 financial institutions for small businesses and 4,693 financial institutions for agriculture and fishery. Each of these groups of banks is governed by the relevant law such as the Banking Law, the Long-term Credit Bank Law, the Foreign Exchange Bank Law, the Concurrent Trust Business Law, etc.

A variety of payment services are offered by the banking system. Banks have co-operated in establishing interbank payment networks such as local bill and cheque-clearing houses, the Zengin Data Telecommunications System (Zengin System), the Foreign Exchange (*Gaitame*) Yen Clearing System (FEYCS), and they make final funds transfers in the BOJ accounts to settle interbank/third-party transactions.

To meet the strong public demand for cash, banks have formed a nationwide CD/ATM network.

Meanwhile, banks provide direct debit/credit services based on three-party agreements made with payers and payees. Also, debit cards for EFTPOS are issued by banks, which are used through banks' EFTPOS systems.

### *1.2.2 Post Office*

As a major government financial institution, the Post Office plays a significant role in payment services. Besides financial services such as postal savings, postal insurance and pensions, the Post Office provides payment services that utilise its transferable deposit accounts, such as: (i) funds transfers; (ii) CD/ATM network services; and (iii) prearranged crediting of salaries and debiting of public utility charges.

All of these services compete with those of private financial institutions. The amount of postal savings totalled Yen 167 trillion (US$ 1.3 trillion) at end-1992.

In 1991, domestic postal funds transfers amounted to 568 million transactions totalling Yen 20 trillion (US$ 148.6 billion), while funds transfers through the Zengin System amounted to 718 million transactions totalling Yen 1,777 trillion (US$ 13.2 trillion). Postal payments are not

linked to interbank funds transfer systems such as the Zengin System and there are upper limits on the amount of each depositor's postal savings.

### *1.2.3 Non-banks*

Technological advances, particularly in the telecommunications field, have enabled non-banks, e.g. securities companies, insurance companies, finance companies (including card companies) and retailers to compete and/or to cooperate with banks in the payment business.

One of the services offered by such non-banks is the "fund integration account" service provided by securities companies, which is a combination of mutual funds at securities companies for medium-term government bond investment and demand deposits at banks. In this service, once the balance of a demand deposit of a customer reaches a preset level, any additional inflow of funds into the deposit account is automatically transferred to the customer's funds account at a securities company. If the customer's demand deposit falls below the level, the shortage is automatically made up for by mutual funds so that the balance in the demand deposit will be kept at the preset level. Banks offer a similar service, transferring a customer's deposit in excess of a preset level automatically to the customer's time deposit account.

Another example of non-banks' involvement in the payment business is the issuance of various cards. Railway and telephone companies issue prepaid cards, while credit card companies affiliated with retail outlets issue credit cards.

## 1.3 The role of the central bank

The Bank of Japan, as provided by the Bank of Japan Law, takes the responsibility for maintaining and fostering a safe and sound financial system. From this point of view, the Bank of Japan provides means of payment with finality, i.e. banknotes and BOJ accounts and, when necessary, functions as the lender-of-last-resort. Also, it conducts monitoring and on-site examinations of its client financial institutions.

### *1.3.1 Issuer of banknotes*

The Bank of Japan is the sole issuer of banknotes in Japan (the Bank of Japan Law, Article 29), which are widely used as a means of payment. To enhance the reliability of banknotes, which constitute an important base for the nation's payment system, the Bank of Japan examines banknotes returned from the public; it counts the number of banknotes received from its client financial institutions, examines their authenticity and sorts them into fit/unfit notes, shredding unfit notes.

Various measures have been taken to prevent banknotes from being counterfeited. The most recent measure has been devised against forgery with photocopiers; new banknotes containing luminous ink and micro-lettering are to be put into circulation from December 1993.

### *1.3.2 Payment services*

The Bank of Japan provides its client financial institutions (including securities companies) with accounts and funds settlements are effected by debiting and crediting these BOJ accounts. Three types of settlements are made in the BOJ accounts. The first type is funds settlements among financial institutions. This type includes funds transfers for third-parties, i.e. customers of financial institutions. The second type is settlement of credit and debit positions resulting from various clearing systems, such as the bill and cheque-clearing systems with clearing houses located throughout the nation, the Zengin System, the Foreign Exchange (*Gaitame*) Yen Clearing System (FEYCS). And the third type is funds transfers between financial institutions and the Bank of Japan

including Treasury funds transfers through the central government deposit account held with the Bank of Japan.

#### *1.3.3 Oversight of payment systems*

In order to maintain the soundness of the nation's payment systems, the Bank of Japan exchanges views with financial institutions on the improvement of those systems, encouraging the institutions to devise self-disciplined, appropriate risk control measures. Along this line, the Bank of Japan may provide advice about the introduction or the modification of rules governing the privately-managed payment systems. In particular, with regard to those systems for which final settlement is made through the BOJ accounts, the introduction or the modification of rules often requires approval of or consultation with the Bank of Japan. In order to maintain and foster a safe and sound financial system, the Bank of Japan regularly monitors and, at certain intervals, conducts on-site examinations of payment system participants which hold accounts with the Bank of Japan.

### 1.4 The role of other institutions

#### *1.4.1 Tokyo Bankers Association (TBA)*

The Tokyo Bankers Association (TBA) is one of seventy-two regional bankers associations in Japan that manage bill and cheque-clearing houses in their respective areas. The first function of the TBA is the secretariat for the *Zengin-kyo* (the Federation of Bankers Associations of Japan), which is the umbrella organisation of those seventy-two regional bankers associations.

The TBA's second function is to manage two privately-managed clearing systems: the Zengin System, which handles domestic funds transfers and the Foreign Exchange Yen Clearing System (FEYCS), also known as the *Gaitame* Yen Clearing System, which conducts cross-border yen payments. Furthermore, the TBA engages in standardisation of bank codes, communication protocols, operating procedures for funds transfers, and IC cards issued by banks to cope with increased volume of electronic payments.

#### *1.4.2 Other regionally-based bankers associations*

Other regionally-based bankers associations conduct bill and cheque-clearing among their member banks as their core business.

## 2. SUMMARY INFORMATION ON PAYMENT MEDIA USED BY NON-BANKS

### 2.1 Cash payments

#### *2.1.1 Cash payments*

The Bank of Japan has the sole right and responsibility to issue and circulate banknotes, while coin is issued by the government. Although there are officially nine denominations of banknotes in circulation, namely Yen 1 (US$ 0.009), Yen 5, Yen 10, Yen 50, Yen 100, Yen 500, Yen 1,000, Yen 5,000 and Yen 10,000, only three denominations are currently issued - Yen 1,000, Yen 5,000 and Yen 10,000. Coins come in six denominations - Yen 1, Yen 5, Yen 10, Yen 50, Yen 100 and Yen 500 - in addition to coins that are specially issued on commemorative occasions. Banknotes and coin received at the Bank of Japan are examined (see Section 1.3.1).

Coin in circulation is issued under the Unit of Currency and Issue of Coins Law of 1988, which stipulates that coin must be accepted in settlement in amounts up to twenty times as much as the face value per given denomination (Article 7). As for payments made to the Government, such as taxes, there is no limit to the acceptability of coin (according to the directives of the Ministry of Finance).

Cash is extensively used in Japan in economic activities compared with other industrial countries. This can be illustrated by the high ratio of outstanding cash in circulation to nominal GNP (9.5% at end-1991, compared to 4.7% in the US and 2.7% in the UK). At end-1992, banknotes in circulation totalled Yen 39 trillion (US$ 312.9 billion), and coin Yen 3.5 trillion (US$ 28.1 billion).

### *2.1.2 CD/ATM networks*

Cash dispensers (CDs), which allow customers to make withdrawals using cash cards, were first introduced by several city banks in 1969, and spread rapidly following the adoption of on-line computer systems by many banks after 1970. Automated teller machines (ATMs), which were first installed in 1977 to enable customers to make withdrawals and deposits with banknotes, today accept banknotes and coin and provide remittances and loans. CD/ATMs have spread very rapidly; by end-March 1992, there were 90,000 machines.

From a regulatory point of view, CD/ATMs installed outside the premises of banks are treated as branches by the Ministry of Finance. Therefore, approval of the Ministry used to be required in advance each time a bank installed CD/ATMs. As this approval procedure was replaced with simple notification to the Ministry in 1987, many banks have since installed CD/ATMs not only inside their premises but also outside, e.g. in department stores and office buildings. Most CD/ATMs are in operation from 8.45 a.m. to 7 p.m. on weekdays, and from 9 a.m. to 5 p.m. on Saturdays and Sundays, whereas bank business hours are from 9 a.m. to 3 p.m.

Interbank on-line CD networks, which were first formed in 1980, are built on a contractual agreement among banks to enable depositors to use CDs owned by other banks. To date, eight on-line networks exist, operated by different groups of banks, i.e. city banks, regional banks, trust banks, member banks of the Second Association of Regional Banks (regional banks II), *Shinkin* banks, credit cooperatives, labour credit associations and agricultural cooperatives.

In February 1990, MICS (Multi Integrated Cash Service) was established to achieve an on-line CD network linkage between the respective networks of city banks and regional banks, which was followed by other linkages between and among groups of banks. In February 1991, a gigantic network of CDs emerged, covering virtually every bank in each group of banks in the private sector.

There is no charge for cardholders' withdrawals of cash from their card-issuing banks' CDs before 6 p.m. on weekdays, but cardholders are charged when using CDs after 6 p.m. on weekdays, after 2 p.m. on Saturdays and on Sundays. An extra fee is charged when using a different bank's CDs.

There is another network called Nippon Cash Service (NCS), which was established jointly by thirty-six banks including city banks, regional banks and regional banks II in 1974 before MICS was established, and currently fifty-one banks participate in it. NCS has about 410 locations for its CDs, mainly in railway stations, hotels, department stores and large supermarkets in metropolitan areas. Cards issued by NCS-participating banks can be used at these outlets.

Interbank funds settlement for payment transactions through CD/ATM networks is done through the Zengin Data Telecommunications System (Zengin System) on the day after each CD/ATM transaction. The interbank settlement is finalised when funds are transferred through their accounts held with the Bank of Japan.

The Post Office and non-banks such as life insurance companies and securities companies have also installed CD/ATMs. The number of CD/ATMs installed by the Post Office and life insurance companies totalled 18,000 (as of end-March 1992) and 8,000 (as of end-June 1992),

respectively (the latter figure includes the number of CD/ATMs installed by non-bank institutions which have tied up with life insurance companies). The number of ATMs installed by securities companies totalled 1,400 (as of end-June 1992).

## 2.2 Non-cash payments

### *2.2.1 Paper-based payments*

Cheques, bills and promissory notes are used as paper-based non-cash payment instruments. Cheques include bank cheques, government cheques, and postal cheques. Cheques are widely used by government agencies and firms, but personal cheques are rarely used for payment of salaries or retail payment including that of credit card bills and public utility charges. These payments are made through direct credits or direct debits (see Section 2.2.2.). Bills and promissory notes are used for payments in the business sector and can be discounted by banks. The value of cheques cleared at bill and cheque-clearing houses accounts for about 60% of the value of all the debit items cleared. The volume of transactions involving paper-based payment instruments has been declining during recent decades.

### *2.2.2 Direct debits and direct credits*

#### *(a) Pre-arranged direct debits*

The pre-arranged direct debit service was first introduced in 1955 for payment of telephone bills. The service expanded rapidly since the early 1960s and is now used extensively for payment of public utility charges, credit card bills, taxes, school tuition, insurance premiums and loan repayments. The payees send payment instructions on a paper basis, on magnetic tapes, or through on-line transmission, to banks, which debit the appropriate amount from the payers' accounts and credit payees' accounts. Transactions are conducted on the basis of three-party agreements between payers, payees and banks. The volume of direct debits in 1991 for the five major public utility charges (electricity, gas, water, telephone and paid television) amounted to 1,707 million transactions.

In order to enhance the efficiency of the direct debit service, banks introduced the so-called "integrated account" service in 1972. While time deposits are the most common form of personal savings in Japan and demand deposit accounts are utilised mainly for settlement purposes, the integrated account combines these two accounts in a single passbook and, in addition, offers an overdraft facility. Direct debits are deducted from the demand deposit account and, when it becomes short of funds, the shortage is automatically made up for by an overdraft against collateral in the form of the time deposit, bonds, etc. Thus, the integrated account offers both savings and overdraft facilities to individuals and is very popular in Japan. Also, banks (and the Post Office) offer another type of service with demand deposits and time deposits involved; when the balance of a customer's demand deposit reaches a preset level, any additional inflow of funds is automatically transferred to the customer's time deposit account.

#### *(b) Pre-arranged direct credits*

The pre-arranged direct credit service is used for payment of salaries, dividends and pensions. Direct crediting of salaries, for example, began in 1969 based upon contracts among employers, employees and banks; now it is used by most large firms. Initially, payment instructions were paper-based, but most firms today deliver their payment instructions to banks on magnetic tapes. Also, in 1988, the Zengin System began providing file-transfer data transmission service to facilitate these bulk payments. This service is called "magnetic tape" data transmission.

The Tokyo Clearing House and the Osaka Clearing House, two of the largest bill and cheque-clearing houses in Japan, operate a magnetic tape exchange system. Currently, 118 financial institutions participate in this exchange at the Tokyo Clearing House. The system works like this; a firm sends its bank a magnetic tape containing information on bank account numbers of payees and the amount to be credited. The bank sends the tape to the bill and cheque-clearing house, which sorts the instructions according to payees' banks, producing new tapes for these banks to enable them to credit the payees' accounts. Interbank clearing is conducted at those clearing houses. Magnetic-tape-based direct crediting has the advantage of relieving employees of the risks involved in carrying a large sum of cash and significantly reduces payment transaction costs for employers and banks.

In 1988, the Zengin System began providing the above-mentioned "magnetic tape" data transmission service. In this service, instructions are sent by file transfer for payment of salaries, dividends and pensions. Interbank clearing is made through the Zengin System. Some of the operations in the above-mentioned magnetic tape exchange system has been replaced by this service.

### *2.2.3 Cards*

Although cash plays an important role in bulk payments, cards such as credit cards and prepaid cards are gaining popularity at retail outlets.

#### *(a) Cash cards*

Cash card services allow cardholders to operate CD/ATMs to withdraw money from or make deposits to their bank accounts, to make funds transfers to other account holders and to make inquiries about their account balances. The services were introduced in 1969 when the first off-line CD system began operation, and their use spread with the expansion of the CD/ATM network. By end-March 1993, Japanese banks had issued 233 million cash cards.

Some cash cards can be used at banks' EFTPOS systems (networks that connect the computers of banks to the terminals installed in retail stores via telephone circuits). These enable stores to instruct banks to collect payment by transferring funds from the customers' accounts to the stores' accounts.

#### *(b) Credit cards*

The credit card business was introduced in 1960. Since then, many banks have entered this business by establishing affiliations. Today, nearly 200 bank-affiliated credit card companies exist. In addition to banks, department stores, large supermarkets and credit sales companies are also active in this field. At end-March 1992, the number of credit cards issued in Japan totalled 203 million.

Amounts paid using credit cards are debited on a designated day of each month directly from cardholders' bank accounts. Cheques are rarely used for payment of credit card bills. In most cases, the Credit and Finance Information System (CAFIS), the system developed primarily by bank-affiliated credit card companies which began operation in 1983, carries out data processing. The system operates in the following way; a card acceptor has his Credit Authorisation Terminal (CAT) which reads the magnetic strip on the customer's credit card and transmits data on the amount of the purchase from the CAT via the CAFIS centre to the host computer of the credit card company. Then, funds transfers are made between the customer's and the credit card company's bank accounts.

*(c) Prepaid cards*

Prepaid cards are cards that store information on how much the holders paid for the cards and the amount they have paid thus far using the cards. The cards remain valid as long as the amount spent using the card is less than the preset amount.

The most common prepaid cards in use today are telephone cards issued by Nippon Telegraph and Telephone Corporation (NTT) and cards issued by Japan Railway (JR) to purchase tickets. These are business-card-sized plastic cards with value units recorded magnetically and whose remaining value units are displayed by a card reader during use. The amount paid for the goods or services is deducted from the remaining value on the card by the card reader until it reaches zero.

*(d) Chip cards (IC cards)*

Though the majority of cards used in Japan are magnetic-strip cards, banks have introduced, in recent years and on an experimental basis, chip cards (IC cards) for payments. In comparison with a magnetic-strip card, an IC card is able to delete and rewrite data (e.g. to update a holder's latest bank account balance) and has a much larger memory capacity.

With these characteristics, IC cards are able to combine the functions of credit cards, cash cards and prepaid cards. Moreover, confidential information contained in IC cards is protected as they are provided with greater security devices than magnetic strip cards. IC cards are capable of storing financial information (such as the outstanding balances in recent deposit accounts) of holders and thus are able to facilitate the operation of off-line banks' POS systems and save banks' computer capacity.

### *2.2.4 EFTPOS*

The EFTPOS service is provided by banks. Banks, customers and retail outlets (e.g. supermarkets, gas stations, restaurants, book stores and others) make contracts in advance. Settlement is processed in either of the following two manners, depending on the time a transaction takes place.

When a customer purchases goods or services using a cash card at a POS terminal during the operating hours of banks' computers, real-time payment is made with a sum equivalent to the amount of purchase transferred from the customer's deposit account to that of the seller after verification of the customer's deposit balance.

During off-line hours - purchases of goods or services after bank business hours - a short-term credit is extended to the customer within a certain upper limit. The credit will be recorded and repaid electronically on the following business day.

The number of participants in EFTPOS projects has been increasing in recent years. At end-March 1993, 240 banks participated in EFTPOS together with 19,944 firms, 28,529 retail outlets and 6.2 million users.

### *2.2.5 Firm banking and home banking*

Banks are trying to expand the scope of their services into firm banking and home banking businesses. Firm banking services, carried out via telecommunications linkages between firms and banks, are now offered by many banks. The types of services cover: (i) financial and accounting information services, e.g. keeping track of each transaction and informing firms of the outstanding deposit balances; (ii) funds transfer services, e.g. transferring funds to other accounts and providing the pre-arranged direct credit service for payment of salaries; (iii) cash management services, e.g. automatic funds collection; and (iv) financial and economic information services which provide firms with information concerning financial markets, foreign exchange and securities markets.

Telecommunications means used between firms and banks include telephone lines, facsimiles and on-line computer-to-computer connections. With regard to data-communications-based systems for these areas, the bank "ANSER (Automated answer Network System for Electrical Request)" system provided by NTT Data Communications Systems Corporation, in particular, has been utilised by banks. This system is also used for home banking.

Cash management services are provided not only by individual banks, but also by cash management network systems in which banks participate. The Joint Cash Management Service Centre began its operation in April 1987. The types of services they provide are multibank reports, magnetic tape data transmission for bulk payments and financial information on such markets as foreign exchange and bond markets. The multibank report service is a comprehensive service that enables companies with accounts at more than one bank to have access to data concerning credit transfers, detailed statements on debits and credits, and account balances. Magnetic tape data transmission service for bulk payments enables companies to transmit all data in a single transmission for multiple banks concerning batch transfers, payments of salaries and wages and direct credits.

Home banking services enable customers to make inquiries about transactions and account balances, receive detailed statements on deposits and withdrawals and to initiate funds transfers at home. In the future, other financial operations, as well as shopping and ticket reservation services are expected to be available. At present, however, home banking services are not widely utilised.

## 3. INTERBANK EXCHANGE AND SETTLEMENT CIRCUITS

### 3.1 General overview

There are four major funds transfer systems in Japan: (i) the bill and cheque-clearing systems; (ii) the Zengin Data Telecommunications System (Zengin System); (iii) the Foreign Exchange (Gaitame) Yen Clearing System (FEYCS); and (iv) BOJ-NET (Bank of Japan Financial Network System).

The following section provides separate outlines of these systems. The first three are privately-managed clearing systems and funds transfers cleared through the Zengin System, the FEYCS, and bill and cheque-clearing houses where the Bank of Japan head office/branches are located are finally settled through the accounts held with the Bank of Japan (BOJ accounts). Most of the interbank transactions are settled on a net basis at a designated time, while a limited number of payments are done on a real-time gross basis through BOJ-NET.

The bill and cheque-clearing systems provide clearing services mostly for paper debit items such as bills and cheques which are exchanged between banks located within the same geographical area. Foreign banks in Japan also participate in bill and cheque-clearing houses, either directly or indirectly through direct participants. The first clearing house was set up in Osaka in 1879; the Tokyo Clearing House was established in 1887.

The Zengin Data Telecommunications System[2], an electronic domestic funds transfer system, is designed to provide a swift nationwide funds transfer medium for participating banks and their customers. The system began operations in April 1973, replacing most of the traditional paper-based processing. Separate data telecommunications centres were set up in Tokyo and Osaka in November 1987 to ensure the security of the system.

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2 The history of the funds transfer system managed by the Tokyo Bankers Association ("Domestic Funds Transfer System") dates back to 1943, when concentrated settlement of domestic funds transfers at the Bank of Japan was implemented. Various revisions were made to the "Domestic Funds Transfer System" thereafter and, currently, most of the "Domestic Funds Transfers" are processed through the above-mentioned Zengin System.

The Foreign Exchange Yen Clearing System, also known as the *Gaitame* Yen Clearing System, was established in October 1980 to facilitate clearing of Yen payments related to cross-border financial transactions. Originally the system functioned on a paper basis. To cope with the rapid growth of the transaction volume, the Tokyo Bankers Association consigned clearing to the Bank of Japan in March 1989, and both clearing and settlement have since been conducted through BOJ-NET.

As computerised systems spread through the financial industry, the Bank of Japan began developing BOJ-NET in 1982. On-line processing in the funds transfer services through the BOJ accounts became operational in October 1988, followed by the introduction of the foreign exchange Yen settlement services in March 1989 and the Japanese government bond (JGB) services in May 1990.

## 3.2 Structure, operation and administration of major large-value systems

### *3.2.1 Bill and cheque-clearing systems (BCCSs)*

At end-1992 there were 721 bill and cheque-clearing houses throughout Japan, 182 of which were designated by the Minister of Justice, a legal authority. The clearing houses are managed by their respective local bankers associations. More than 80% of the total clearing value is concentrated at the Tokyo Clearing House, where the daily average of clearing amount in 1992 was Yen 11.8 trillion (US$ 93.2 billion).

#### *(a) Rules*

Each bill and cheque-clearing house sets its own rules, but to enhance the efficiency in cash management of financial institutions, the harmonisation of these rules has been promoted among the clearing houses. For example, the settlement time has been standardised at 1 p.m. since the introduction of BOJ-NET. Any revisions to the rules of clearing houses which make final settlement in the BOJ accounts require the approval of the Bank of Japan.

#### *(b) Participants*

Major banks, including foreign banks in Japan, participate directly. Small financial institutions participate through direct participants. As of end-March 1993, 567 institutions participated in the Tokyo Clearing House, of which 134 institutions were direct participants.

#### *(c) Types of transaction handled*

The BCCSs mainly handle funds transfers resulting from exchange of bills and cheques associated with commercial trades between firms. The BCCSs also deal with bills and cheques resulting from asset transactions of bonds and equities, negotiable certificates of deposit, and foreign exchange.

#### *(d) Operation of the transfer system*

Bills and cheques collected at the Tokyo Clearing House are cleared and settled in the following manner: (i) bills and cheques are presented by the payees at the payees' banks; (ii) these items are passed on, from the late afternoon of the day before the settlement day through the morning of the settlement day because of the large volume of transactions involved, to the Tokyo Clearing House, where the net credit/debit position of each participant is calculated; and (iii) the net positions are settled at 1 p.m. on the settlement day through the individual banks' BOJ accounts.

The Tokyo Clearing House began automation of the clearing process with the incorporation in 1971 of computers and facilities which read and sort out bills and cheques. All processing of MICR-printed (see Glossary) bills and cheques presented at banks has since been automated, including classification of these items by payers' banks and calculation of the value of receipt, payment and the net position of each bank.

#### *(e) Settlement procedures*

In general, proceeds can be withdrawn by the payee on the day after the settlement day because interbank settlement in these systems is not finalised until 11 a.m. on the day after the settlement day, when it has been confirmed that bills and cheques have not been dishonoured.

Should a payer's bank fail to meet its obligation to pay, unwinding of the bills and cheques involving the failed bank is to take place.

### *3.2.2 Zengin Data Telecommunications System (Zengin System)*

The Zengin System is managed by the Tokyo Bankers Association (TBA). To ensure the security of the system, the TBA has set up separate centres in Tokyo and Osaka. In 1992, the system handled a daily average of 3.1 million transactions, while the daily clearing value averaged Yen 7 trillion (US$ 55.3 billion), an 88% increase over the past five years.

Its communications network is provided and maintained by NTT Data Communications Systems Corporation.

#### *(a) Rules*

The TBA establishes rules of the Zengin System, stipulating procedures for conducting domestic funds transfers. The TBA has to notify the Bank of Japan in advance, should any decisions on or revisions to rules relating to clearing for domestic funds transfers be made.

The Bank of Japan itself draws up rules concerning settlement of the positions of participants related to domestic funds transfers, for it is involved in funds transfers through the Zengin System in that final settlement is made through the BOJ accounts and that it provides liquidity in the case of a bank failure.

The TBA also sets rules stipulating the management of the domestic funds transfer system including membership criteria and procedures for entry to and withdrawal from the system. Also, to be eligible for participation in the Zengin System, banks need to enter into a contract with the Bank of Japan, which provides final settlement as mentioned above.

#### *(b) Participants*

Banks, including foreign banks in Japan, participate directly in the Zengin system. Small financial institutions including various cooperatives participate in the system through those banks which function as their umbrella bodies. As of end-June 1993, 4,123 institutions comprising 45,133 offices participated in the system, of which 158 institutions were direct participants. End-users include firms and individuals. The system is not linked with the postal funds transfer system.

Small institutions, i.e. credit associations, credit cooperatives, labour credit associations, agricultural and fishery cooperatives and a group of regional banks, have their respective funds transfer systems. The structure of each of these systems is similar to that of the Zengin System.

### *(c) Types of transaction handled*

The Zengin System is designed to handle domestic funds transfers for third-parties, where not only sending banks and receiving banks but also payer customers and/or payee customers are involved. Transactions of this type include direct credits such as payments of salaries, pension payments and stock dividend payments, remittances, and payments resulting from inter-regional collection of bills and cheques.

### *(d) Operation of the transfer system*

Participants in the Zengin System exchange payment instructions electronically via relaying computers which are installed either by participants or by joint centres for certain groups of financial institutions such as credit associations, credit cooperatives, etc. The Zengin System and the Bank of Japan are linked on-line.

Funds transfers through the Zengin System are completely electronic. A funds transfer begins with a payer requesting a funds transfer through the payer's bank. A payment instruction is sent to the Zengin Centre, which in turn sends the instruction to a payee's bank. Upon receiving the instruction, the payee's bank credits the payee's account. Payment instructions are transferred to the Zengin Centre on a transaction-by-transaction basis between 9 a.m. and 3.30 p.m.

The debit and credit positions of participants are calculated within the system. The obligations between the banks are replaced by those between the Bank of Japan and each bank, and the obligations are discharged by debiting and crediting the BOJ accounts at 5 p.m. on the same day. Settlement in this system is thus made on a gross basis.

### *(e) Settlement procedures*

As noted above, funds become available to the payee before interbank settlement is completed at the end of the day. Payments can be revoked or amended before interbank settlement is made only if agreed to.

### *(f) Pricing policies*

Participating banks charge their customers for using the system. For funds transfers, although charges differ among individual sending banks, examples are: Yen 412 (US$ 3.9) for transfers less than Yen 10,000 (US$ 93.9); Yen 515 (US$ 4.8) for transfers equal to Yen 10,000 or more but less than Yen 30,000 (US$ 281.7); and Yen 721 (US$ 6.8) for transfers equal to Yen 30,000 or more. In the case in which transfers are made through ATMs, transaction costs are lowered: Yen 309 (US$ 2.9) for transfers less than Yen 10,000; Yen 412 for transfers equal to Yen 10,000 or more but less than Yen 30,000; and Yen 618 (US$ 5.8) for transfers equal to Yen 30,000 or more.

### *(g) Credit and liquidity risks and their management*

The TBA formerly adopted next-day interbank settlement in the Zengin System. To reduce credit risk incurred by the payee's bank vis-à-vis the payer's bank, same-day interbank settlement started in March 1993. Accordingly, the Bank of Japan has extended BOJ-NET operating hours by two hours to facilitate same-day settlement.

Moreover, the TBA plans to modify the cap policy in January 1994 as follows:

Currently, a sender net debit cap is set on each bank at ten times the daily average of its gross debit positions in the previous year. The cap cannot be changed during the year. Each bank is required to pledge collateral with the Bank of Japan based on the daily average of its gross debit positions in the previous year, but it is uncertain to what extent the collateral would cover the loss in

the case of an actual bank failure. In the case of a bank failure, the Bank of Japan is supposed to provide liquidity for the system participants; the Bank of Japan pays the defaulted amount on behalf of the failed bank and then liquidates collateral the bank has pledged with the Bank of Japan in advance. A loss-sharing rule is adopted to cover the loss resulting from a bank failure in excess of the amount of collateral pledged by the failed bank. The remaining participants are supposed to contribute, in proportion to required collateral, shares of the residual amount to reimburse the Bank of Japan for the loss it has incurred.

Under the new cap policy, a sender net debit cap will be determined by each bank at its own discretion. At the same time, the Bank of Japan will be introducing net settlement for funds transfers in the Zengin System, which will replace the current gross settlement arrangements. Banks will be permitted to change their caps any time during the year. Collateral requirements are to be set in proportion to these self-declared sender net debit caps. The caps will be valid after banks deposit required collateral with the Bank of Japan and after the Bank of Japan acknowledges the caps reported by the banks. These arrangements are expected to give participants more incentives for risk reduction.

The minimum collateral requirement for each bank will be set at a certain proportion of the cap it has determined. The required proportion of the collateral against the cap will be low in the early stages; however, the proportion is to be increased in the future. Additional collateral will be required if net debit positions should exceed the amount of collateral pledged. Additional collateral will be placed for the next two quarters, the amount of which will be calculated in consideration of the sise and frequency of net debit positions exceeding the amount of collateral pledged for the preceding two quarters.

In the case of a bank failure, a loss-sharing rule will be applied to cover any loss exceeding collateral pledged by the failed bank. The remaining participants will contribute, in proportion to the caps they have determined, shares of the residual amount to reimburse the Bank of Japan for the loss it has incurred.

### *3.2.3 Foreign Exchange (GAITAME) Yen Clearing System (FEYCS)*

The FEYCS is managed by the TBA. The TBA consigned to the Bank of Japan clearing of Yen payments related to cross-border financial transactions in March 1989. The system has since been operated by the Bank of Japan as part of the BOJ-NET, which conducts both clearing and settlement for FEYCS transactions. In 1992 the system handled a daily average of 24,672 transactions. The daily average clearing value in 1992 was Yen 25 trillion (US$ 197.4 billion), a 97% increase over the past five years.

#### *(a) Rules*

The TBA lays down rules for foreign exchange Yen clearing which stipulate membership criteria, procedures for entry to and withdrawal from the FEYCS, and clearing procedures. Any revisions to the rules require the Bank of Japan's approval.

#### *(b) Participants*

Banks, including foreign banks in Japan, participate in the FEYCS. As of end-June 1993, 175 banks including 73 foreign banks participated in the FEYCS.

#### *(c) Types of transaction handled*

The FEYCS handles Yen payments resulting from cross-border financial transactions such as foreign exchange transactions, Yen-denominated bond transactions and trades in goods and services.

*(d) Operation of the transfer system*

The whole payment process is performed electronically on BOJ-NET. A sending bank which receives from a bank located overseas a telex or S.W.I.F.T. message requesting a funds transfer enters a payment instruction from a BOJ-NET terminal by 1.45 p.m. for settlement to be conducted on the same day. The Bank of Japan in turn sends the instruction to the receiving bank, and automatically calculates the net credit/debit position of each bank. The net positions are settled through the BOJ accounts at 3 p.m. on the same day. Payment instructions can be sent either on the day settlement is to be conducted (same-day settlement) or up to three days before the settlement day (post-dated settlement). The cut-off time for post-dated settlement is 4 p.m. BOJ-NET participants whose host computers are directly connected with those at the BOJ-NET centre on a CPU-to-CPU basis, can carry out their payments by automatic processing upon receipt of S.W.I.F.T. messages from overseas banks.

*(e) Settlement procedures*

Interbank net settlement for payment instructions entered before 1.45 p.m. is completed at 3 p.m. on the same day. Payment can be amended only if agreed to by the receiving bank, and can be revoked only if the receiving bank agrees and sends an instruction which will offset the original payment instruction.

*(f) Pricing policies*

Participants other than the members of the TBA pay entry fees of the FEYCS to the TBA. All participants pay variable charges to the Bank of Japan for using BOJ-NET for FEYCS transactions: Yen 60 (US$ 0.6) per transaction. They also pay fixed charges for linkage with the BOJ-NET centre.

*(g) Credit and liquidity risks and their management*

A receiving bank is exposed to credit risk if it makes funds available to the payee before interbank settlement is completed. To contain this risk, each participant can set a bilateral net credit limit for each of the other participants. Every transaction is checked to ascertain whether or not it will exceed the limit; if it does, the instruction is regarded as an error message and thus rejected.

In the case of a bank failure, a loss-sharing rule is to be applied so that each bank with a credit position vis-à-vis the failed bank will bear a loss in proportion to the amount of credit it extended to that bank.

*3.2.4 BOJ-NET (Bank of Japan Financial Network System)*

BOJ-NET is an on-line system introduced in October 1988 for electronic funds transfers among financial institutions including the Bank of Japan. BOJ-NET is managed by the Bank of Japan. The system has reduced the use of paper-based services provided by the Bank of Japan such as the use of BOJ cheques. In 1992, the daily transaction volume and value settled through BOJ-NET averaged 14,961 and Yen 144.8 trillion (US$ 1.1 trillion), respectively.

*(a) Rules*

The Bank of Japan establishes rules on the use of BOJ-NET. To be eligible for the BOJ-NET funds transfer services directly, financial institutions must hold accounts with the Bank of Japan.

### *(b) Participants*

Banks, securities companies and money brokers (the so-called *Tanshi* brokers), including foreign banks and foreign securities companies in Japan, participate in the system. As of end-June 1993, 371 financial institutions participated in the BOJ-NET funds transfer services.

### *(c) Types of transaction handled*

Most of the payment services provided by the Bank of Japan can be handled by BOJ-NET; it conducts: (i) funds transfers among financial institutions associated with interbank money market and securities transactions; (ii) funds transfers within the same financial institution (in-house funds transfers); (iii) settlement of the positions resulting from the privately-managed clearing systems; and (iv) funds transfers between financial institutions and the Bank of Japan (including Treasury funds transfers).

Funds transfers handled by BOJ-NET are generally credit transfers, but in the case of in-house funds transfers, debit transfers can also be made.

A sending bank can transmit a payment instruction with information on the sending and/or receiving banks' customers. A minimum value is set for the third-party transfers at Yen 300 million (US$ 2.8 million). There are some restrictions on the use of third-party transfers when the service is used by financial institutions which are not allowed to engage in funds transfer business. In 1992, the number of funds transfers in volume and value for transfers with customer information amounted to 172 and Yen 1.9 trillion (US$ 15 billion), respectively.

### *(d) Operation of the transfer system*

Participants make funds transfers from one BOJ account to another by sending payment instructions from BOJ-NET terminals within the individual participants' installations. Funds transfers are settled either on a real-time gross basis (from 9 a.m. to 5 p.m.) or on a designated-time basis, depending on participants' direction. There are four designated settlement times: 9 a.m., 1 p.m., 3 p.m. and 5 p.m. Payment instructions can also be sent on the day before settlement, the cut-off time for such settlement being 5.20 p.m.

### *(e) Settlement procedures*

Funds transfers once made through BOJ-NET are irrevocable and unconditional. In the case of designated-time settlement, payment instructions can be revoked before they are executed, but real-time funds transfers are instantaneously irrevocable.

### *(f) Transaction-processing environment*

BOJ-NET is an on-line network system which links the BOJ-NET centre of the Bank of Japan to financial institutions, the Bank of Japan head office and its branches. While its basic function is the provision of on-line transactions between participants and the BOJ-NET centre through BOJ-NET terminals installed by the participants, a direct CPU-to-CPU link is available in the FEYCS.

The host computer systems at the BOJ-NET centre are duplicated for the purpose of risk diversification. Both systems, Systems A and B, are of the same model, and each system comprises an operating machine and a hot standby machine. In other words, four host computers are always ready for operation. Most of the peripheral equipment, such as the communication control unit, and the data base are also duplicated to ensure safety.

The system network is based on leased lines and DDX (Digital Data Exchange) packet-switching lines, both of which are provided by Nippon Telegraph and Telephone Corporation (NTT),

a Japanese common carrier. These two types of lines are connected with CPUs in the BOJ-NET centre; leased lines are used for linkages with participants' BOJ-NET terminals located in Tokyo and for all direct CPU-to-CPU linkages, while DDX packet-switching lines are used for linkages with BOJ-NET terminals outside Tokyo. To ensure safety, lines connecting the BOJ-NET centre and the telephone exchanges are duplicated. Similarly, to forestall system malfunctions due to accidents at a telephone exchange, lines connecting the BOJ-NET centre and major branches of the Bank of Japan are housed in two different telephone exchanges.

Also, contingency measures are incorporated to cope with hardware and software malfunctions. Operation of the system is constantly monitored at the centre to detect problems at the earliest time.

#### *(g) Pricing policies*

Participants pay variable charges to the Bank of Japan: Yen 40 (US$ 0.4) for ordinary funds transfers and Yen 60 (US$ 0.6) for third-party funds transfers. They also pay fixed charges for linkage with the BOJ-NET centre. Participants set fees for third-party transfers for their customers.

#### *(h) Credit and liquidity risks and their management*

The Bank of Japan does not extend daylight overdrafts. If a participant does not have sufficient funds in its account for a real-time funds transfer, the payment instruction is automatically rejected. In the case of designated-time funds transfers, the Bank of Japan monitors beforehand the positions of participants so that they will not have negative balances in their BOJ accounts and that designated-time settlement will thereby be executed.

## 4. SPECIAL USE OF INTERBANK TRANSFER SYSTEMS FOR INTERNATIONAL AND DOMESTIC FINANCIAL TRANSACTIONS

### 4.1 Exchange and settlement systems for international transactions

#### *4.1.1 General overview*

In Japan, as of 1st July, 1993, there were ninety foreign banks operating 145 branches; as of 1st August, 1993, sixty-nine Japanese banks had 353 branches overseas and 343 subsidiaries abroad.

Financial deregulation and globalisation combined with cheaper telecommunications devices have spurred a sharp increase in cross-border financial transactions.

The Foreign Exchange (*Gaitame*) Yen Clearing System (FEYCS), established in October 1980, conducts clearing of Yen payments related to cross-border financial transactions such as foreign exchange transactions, Yen-denominated bond transactions and trades in goods and services.

The Post Office provides cross-border payment services in addition to domestic funds transfers. The Post Office has linkages with 100 nations for the exchange of money orders. The exchange of orders on an electronic basis is also possible with 24 of these nations.

Also, domestic funds transfers have increasingly been undertaken by foreign financial institutions, and cross-border payments and offshore clearings have expanded. Offshore clearing is an intermediate clearing done in countries other than the country of the currency issue. In Japan, a significant volume of dollar payments arising from foreign exchange transactions are handled by Tokyo branches of US banks which debit and credit correspondent accounts of other banks. The

branches transfer the net credit/debit positions of individual banks to their head offices in the US later in the day.

Over the past years, there has been extensive use of proprietary networks of individual financial institutions, although they may not be categorised, in strict terms, into interbank transfer networks. Using their advanced networks, some of the banks are expanding their correspondent banking services.

The payment instructions for cross-border payments are mostly transmitted through S.W.I.F.T. (Society for Worldwide Interbank Financial Telecommunication S.C.). At end-1992, 187 financial institutions in Japan participated in this network, and the volume of transfers through the network has been continuously increasing.

#### *4.1.2 Foreign Exchange (GAITAME) Yen Clearing System (FEYCS)*

Large-value Yen transfers that arise from cross-border financial transactions including foreign exchange transactions, Yen-denominated bond transactions and trades in goods and services are, in most cases, cleared through the FEYCS (See Section 3.2.3). Some part of Yen settlements that arise from foreign exchange transactions between domestic market participants is done through the bill and cheque-clearing systems (see Section 3.2.1).

#### *4.1.3 In-house global networks*

Internationally active banks tend to use their own proprietary networks for payments that arise from cross-border financial transactions. By using these networks, some banks are expanding their correspondent banking services.

### 4.2 Exchange and settlement systems for securities and derivative transactions

Securities traded in Japan consist mainly of Japanese government bonds (JGBs), agency and corporate bonds, and equities. In the latter half of the 1980s, JGB and equity transactions, in particular, expanded remarkably. Between 1984 and 1989, JGB and equity transactions grew more than five times, while agency and corporate bonds increased over 1.5 times. In 1992, the daily average transaction volumes were: 6,029 for JGBs; 633 for agency and corporate bonds; and 652 for equities in Yen billions (47.6, 5, and 5.1 in US$ billions, respectively).

JGBs are traded on over-the-counter (OTC) and stock exchange markets. JGB transactions are categorised into two groups by transaction value: "small-value transactions" (Yen 1 to 10 million, US$ 0.009 to 93.9 thousand) and "large-value transactions" (over Yen 10 million). The latter are mainly executed in the OTC market and only 1% is done on exchanges. The former, on the other hand, are traded exclusively on exchanges.

Almost all equity transactions are executed on exchanges; the OTC market is still developing.

There are eight stock exchanges throughout Japan, although most of the JGB and equity transactions handled on exchanges are conducted on the Tokyo Stock Exchange (TSE).

The futures markets for JGBs and equities are large compared to their underlying spot markets; in 1992 the daily turnover of JGB futures and stock index futures were 1.6 times and three times the spot markets, respectively. JGB futures are traded on the TSE, while equity futures are traded on the TSE as well as the Osaka Securities Exchange.

Commodity futures are traded at sixteen commodity exchanges throughout the country. Financial futures and options, i.e. Euro-Yen and Euro-dollar interest futures and dollar/Yen currency futures as well as options on Euro-Yen futures, are traded on the Tokyo International Financial

Futures Exchange (TIFFE). Trading began in June 1989. In 1992, the daily trading volume of all these financial futures and options amounted to 63,000 contracts, while the number of outstanding open interests at end-1992 was 500,000 contracts.

### *4.2.1 Japanese Government Bonds (JGBs)*

#### *(a) Participants*

Securities companies and banks make market and match trades as well as offer custody services. Banks, insurance companies and investment trusts as well as some foreign central banks and other foreign institutions are the major investors.

#### *(b) JGB delivery system*

Most of the JGB transactions are settled through either of the two systems which involve no physical delivery: the registration system or the book-entry system. In the registration system, the right of the registered owner of JGBs is exercised on the registrar's book at the owner's request. In the book-entry system, JGBs are held by the depository and JGB transfers are made between bond accounts. The Bank of Japan plays an important role in these systems: it functions as the registrar for the former and as the depository for the latter.

*(i) JGB registration system*

The JGB registration system was introduced in 1906 with the Bank of Japan as the registrar. In this system, registrations are made on the register so that JGBs are transferred without physical delivery (dematerialisation). A JGB holder can set up against the government or against third parties by making registrations. This system can be used by anyone who so wishes, and participants are not restricted to financial institutions.

A transfer in this system is effected when the registered bond holder signs an application for the registration of JGBs which the transferee must sign as well. The Bank of Japan then makes the transfer in its book upon receipt of the request.

This process has been conducted on an electronic basis since the introduction of the BOJ-NET JGB services in May 1990.

*(ii) JGB book-entry system*

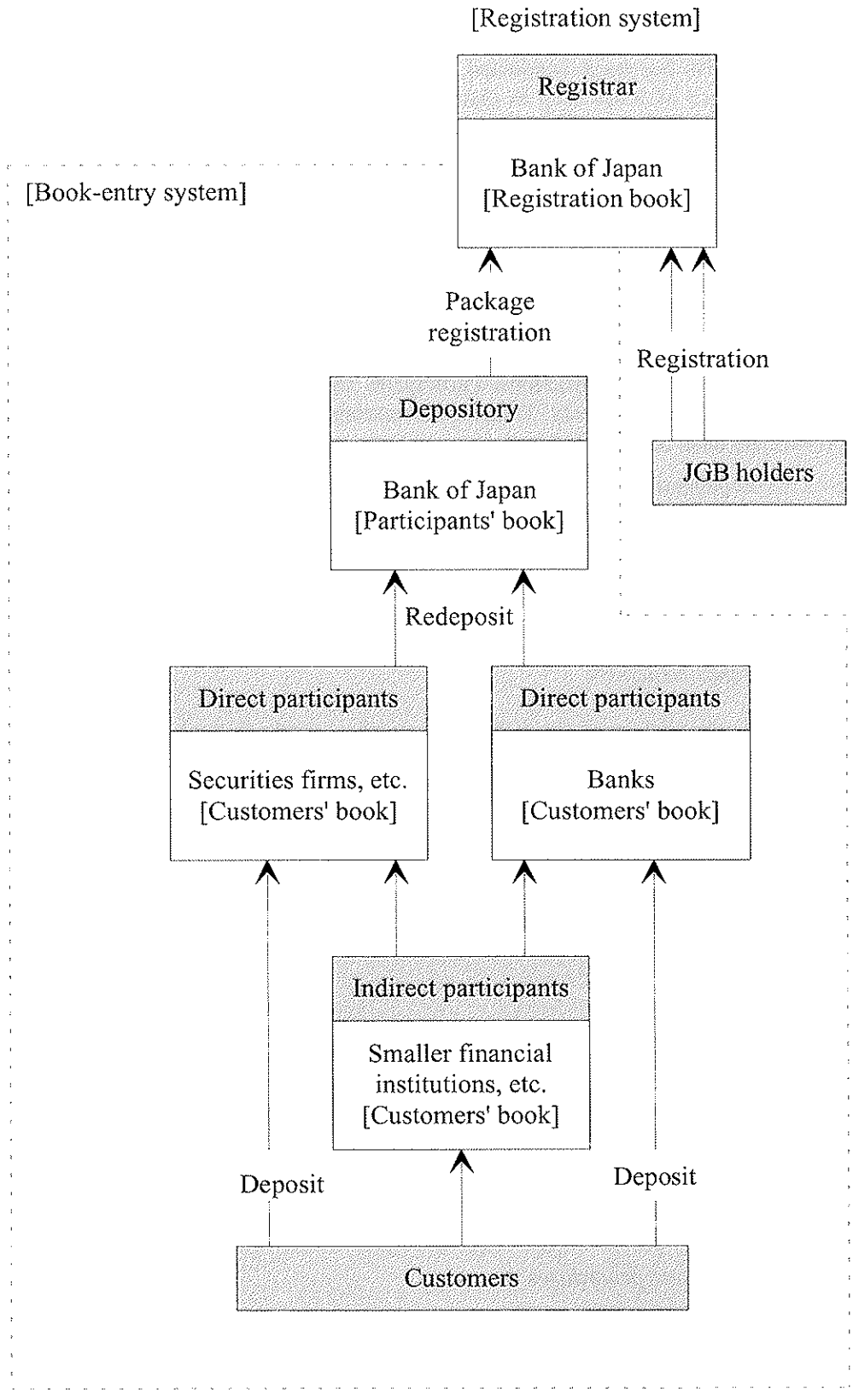
The JGB book-entry system was introduced in 1980 to facilitate the increased number of JGB transactions and their settlements.

This is a tiered system which consists of customers, direct/indirect participants, and the depository, namely the Bank of Japan; direct/indirect participants are restricted to financial institutions such as banks, securities companies, stock exchanges, etc. In this system, (i) participants' customers deposit JGBs with participants; each of the participants, keeping books on its customers, holds those deposited JGBs in a group and redeposits those JGBs under its own name with the depository of the system, i.e. the Bank of Japan, and (ii) the Bank of Japan then registers those redeposited JGBs with the registrar of the system, i.e. the Bank of Japan, in its name (thus JGBs in this system are held in commingled form).

When a direct participant A wishes to sell JGBs to participant B, only an instruction to the Bank of Japan by A is required, and settlement is made between the bond accounts; A's account is debited and B's credited.

Chart 1

**JGB registration system and book-entry system**



This process has been conducted on an electronic basis since the introduction of the BOJ-NET JGB services. Treasury bills and financing bills are all held in book-entry form and settled in the book-entry system.

Together with delivery of JGBs through the above-mentioned two systems, bidding on newly-issued JGBs has been conducted on an electronic basis since May 1990, and instructions relating to issuance of JGBs such as instructions for payment have been processed on an electronic basis since May 1992. For each of these services, instructions can be sent from the BOJ-NET terminals installed by the participants in the BOJ-NET JGB services.

***(c) Settlement procedures***

*(i) Securities delivery*

In the BOJ-NET JGB services, participants in the registration or book-entry system originate on-line transfer instructions. Participants can select either real-time (9 a.m. - 3 p.m.) or designated-time (3 p.m.) delivery. Transfer instructions can be sent up to 19 days before delivery. The cut-off time for such delivery is 4 p.m.

In general, most JGBs are settled six times a month in the following manner; taking the case of October 1992 as an example, contracts made on 18th to 24th and 25th to 30th September and 1st to 5th, 6th to 9th, 12th to 15th, and 16th to 20th October were settled on 5th, 12th, 15th, 20th, 26th and 30th October, respectively. Thus, rolling settlement is not commonly used in JGB settlement, exceptions being Treasury bills, which are settled on a T+3 basis.

*(ii) Funds settlement*

Funds settlement for JGB transactions is made through the following systems on the same day as the corresponding securities delivery. Funds settlement for JGBs traded on the exchanges is conducted among settlement banks designated by each exchange through the bill and cheque-clearing systems (BCCSs). There is no typical payment system, however, for funds settlement for JGBs traded on the OTC market; banks' in-house funds transfers, the Zengin Data Telecommunications System, the BCCSs or BOJ-NET can be used.

The Bank of Japan is going to introduce a DVP (Delivery versus Payment) mechanism in JGB settlement by linking BOJ-NET funds transfers with the BOJ-NET JGB transfers.

### *4.2.2 Equities*

***(a) Markets and participants***

Direct access to an exchange is limited to securities companies which are qualified by the exchange to trade on the floor or through a screen-based trading system named "Computer-assisted Order Routing and Execution System" as members of the exchange.

***(b) Settlement procedures***

*(i) Securities delivery*

Rolling settlement on a T+3 basis is most common in equity transactions.

Most of the equities are held in the form of physical certificates; only a small portion is booked at a book-entry delivery organisation, i.e. the Japan Securities Depository Centre (JASDEC).

Before it started providing services in October 1991, equities transactions executed on the Tokyo Stock Exchange were delivered by its wholly-owned subsidiary, Japan Securities Clearing Corporation (JSCC). JSCC kept securities deposited by member securities companies for their customers and/or for themselves and the securities were delivered through the members' accounts with JSCC, and therefore, in most cases without physical delivery. However, procedures at JSCC still involved physical deliveries as securities were returned to the shareholders whenever they had to exercise their shareholding rights.

In May 1984, the Law Concerning Central Depository and Book-entry Delivery for Share Certificates and Other Securities was enacted and, in October 1991, the JASDEC began providing services. The law enabled investors to own and transfer shares and to exercise other rights thereof without moving physical certificates. All stocks traded on exchanges as well as OTC are now delivered through the members' accounts on T+3. The cut-off times for transfer instructions differ, depending on whether the instructions are sent on the settlement day (T+3) or on the day before the settlement day (T+2). With regard to transfer instructions to be sent on the day before delivery (T+2), the cut-off time for instructions to be sent through terminals is 4 p.m., while, in the case of file transfers on a computer-to-computer basis, instructions are accepted by the JASDEC from 3 a.m. to as late as 8 p.m. on that day. The delivery concerned is made at 9 a.m. on the next day (T+3). The cut-off time for transfer instructions to be sent on the settlement day (T+3) is 3.30 p.m. and the securities concerned are delivered immediately on receipt of the instructions by the JASDEC.

*(ii) Funds settlement*

Members of stock exchanges settle their transactions through settlement banks designated by each exchange. Funds settlement is done by using cheques. Cheques are presented at the settlement bank on T+3, with interbank settlement conducted on T+4 through the BCCSs. Final payment thus takes place on the day after the securities delivery is effected (not same-day funds).

***(c) Risk management***

Stock exchanges devise several risk management measures. For example, stock exchanges set entry requirements for members, i.e. membership is limited to securities companies with high credit standing and adequate capital. In addition, stock exchanges require their members to deposit guarantee funds. In the case of a member's failure to meet its obligation, the stock exchange provides liquidity by liquidating guarantee funds deposited in advance. For any loss in excess of these funds, the surviving members are required to deposit additional guarantee funds.

### *4.2.3 Derivative instruments on TIFFE (Tokyo International Financial Futures Exchange)*

***(a) Participants***

Banks, securities companies, insurance companies, call money brokers and foreign exchange brokers, including foreign banks and foreign securities companies in Japan, participate in TIFFE. They are categorised into two groups, i.e. clearing members and non-clearing members and the former settle transactions on behalf of the latter.

***(b) Settlement procedures***

TIFFE has a clearing house as one of its sections. The clearing house functions as the central counterparty and conducts funds settlement of the net positions. Transactions are novated into those between the clearing house and clearing members.

Participants' positions are calculated to mark-to-market after 5 p.m. every day and variation margin settlement is conducted on the next business day. For trading conducted during the after-hours session, which is regarded as next-day business, settlement is made, therefore, two days after trading.

Procedures for funds settlement for transactions made on TIFFE are as follows: (i) clearing members are required to credit their accounts held with their designated settlement banks; (ii) funds are transferred from the clearing members' accounts to the TIFFE's account, which is also held with the members' settlement banks mentioned in (i); and then (iii) the Bank of Japan provides final settlement between different settlement banks at the request of TIFFE on behalf of the settlement banks through BOJ-NET at 1 p.m.

#### *(c) Risk management*

TIFFE requires its clearing members to make loss compensation deposits in addition to margins and membership deposits. In the case of a non-clearing member's failure to meet its obligation, the clearing member settles the transaction on its behalf, and in the case of a clearing member's failure to meet its obligation, similar measures are taken between the clearing member and TIFFE. With regard to the latter, TIFFE provides the clearing member with liquidity by drawing down credit lines from settlement banks which are set in advance. The loss incurred by TIFFE is compensated for with: (i) deposits with TIFFE of the failed clearing member; (ii) reserve for default compensation of TIFFE; and (iii) loss compensation deposits made by the surviving clearing members. For any loss in excess of these funds, the surviving clearing members are required to make additional loss compensation deposits.

## 5. THE ROLE OF THE CENTRAL BANK IN INTERBANK SETTLEMENT SYSTEMS

### 5.1 General responsibilities

The Bank of Japan Law of 1942 (Article 1) stipulates the Bank of Japan's purpose as follows:

"The Bank of Japan has for its object the regulation of the currency, the control and facilitation of credit and finance, and the maintenance and fostering of the credit system, pursuant to the national policy, in order that the general economic activities of the nation might adequately be enhanced."

From this article, the Bank of Japan has two important purposes: stabilising the value of the currency, and maintaining and fostering a safe and sound financial system. To pursue the latter, the Bank of Japan places emphasis on the payment and settlement systems. The Bank of Japan provides the means of payment with finality and functions as the lender-of-last-resort. The Bank of Japan conducts on-site examinations of the financial institutions that hold accounts with the Bank of Japan (BOJ accounts). The Bank of Japan may provide advice about the introduction or the modification of rules governing the privately-managed payment systems. In particular, with regard to those systems for which final settlement is made through the BOJ accounts, the introduction or the modification of rules often requires approval of or consultation with the Bank of Japan.

## 5.2 Provision of settlement facilities

### *5.2.1 Central bank accounts for payment*

The Bank of Japan provides the means for payment with finality, i.e. issuing banknotes and accepting accounts through which payment and settlement are processed.

There is no statutory qualification that restricts the range of the Bank of Japan's account holders. The Bank of Japan accepts financial institutions as account holders if the acceptance is considered to contribute to the pursuit of monetary policy and the stability of payment systems, given that the institution is capable of conducting payments through the BOJ accounts.

There are three types of payments and settlements that are made in the BOJ accounts (see Section 1.3.2).

### *5.2.2 BOJ-NET (Bank of Japan Financial Network System)*

Services provided through BOJ-NET can be categorised into two groups: (i) the funds transfer services including the foreign exchange yen settlement services (see Sections 3.2.3 and 3.2.4) and open market operation services (see Section 5.3.1); and (ii) the Japanese government bond (JGB) services (see Section 4.2.1).

Operating hours for each of the services are: (i) in the case of the funds transfer services, 9 a.m. to 5 p.m. (for same-day settlement) and 9 a.m. to 5.20 p.m. (for post-dated settlement), in the case of the foreign exchange yen settlement services, 9 a.m. to 1.45 p.m. (for same-day settlement) and 9 a.m. to 4 p.m. (for post-dated settlement); and (ii) in the case of the JGB services, 9 a.m. to 3 p.m. (for same-day delivery) and 9 a.m. to 4 p.m. (for post-dated delivery).

The number of participants as of end-June 1993 in the funds transfer, foreign exchange yen settlement and JGB services was: 371, 175 and 378 financial institutions, respectively.

### *5.2.3 Relations with privately-managed clearing systems*

Debit and/or credit positions of participants in the privately-managed clearing systems are settled either directly or indirectly through the BOJ accounts. The net debit/credit positions of participants in the bill and cheque-clearing systems are settled at 1 p.m., those of the Foreign Exchange Settlement System are settled at 3 p.m., and debit and credit positions of participants in the Zengin Data Telecommunications System (Zengin System) are settled at 5 p.m.

The Bank of Japan, as a matter of course, takes interest in the privately-managed clearing systems owing to its responsibility, stipulated by the Bank of Japan Law, for the soundness of the financial system.

### *5.2.4 Role in settlement of securities transactions*

The BOJ-NET JGB services, introduced in May 1990, provide on-line processing of JGB delivery for secondary market transactions and of bidding for newly-issued JGBs as well as on-line services relating to issuance of JGBs. As in the funds transfer services, both real-time and end-of-day (3 p.m.) settlement are available for JGB registrations and book-entry transfers. For end-of-day settlement, participants are allowed to make inputs in advance which are accepted nineteen days before the settlement day. The bidding services enable BOJ-NET participants to perform all bidding procedures on-line. The services include bidding for Treasury Bills, medium-term and twenty-year JGBs, as well as some ten-year JGBs.

By connecting the BOJ-NET funds transfer system with the BOJ-NET JGB transfer system, the Bank of Japan is planning to introduce a DVP mechanism which will allow participants to

make simultaneous settlement of government securities and corresponding funds, thereby eliminating principal risks inherent in the current arrangements.

#### *5.2.5 Provision of credit facilities*

Three types of credit facilities can be provided for different purposes by the Bank of Japan. The first type is lending and money market operations from a monetary policy viewpoint (daylight overdraft facility is not provided). The second type is lending derived from the function of the lender-of-last-resort. The third type is lending for special purposes including the import bill discount facility.

#### *5.2.6 Pricing policies*

For BOJ-NET, participants pay variable charges: Yen 40 (US$ 0.4) for an ordinary funds transfer and Yen 60 (US$ 0.6) for a third-party funds transfer. They also pay fixed charges for linkage with the BOJ-NET centre.

### 5.3 Monetary policy and payment systems

#### *5.3.1 Existing relationships*

As mentioned earlier, the Bank of Japan Law stipulates that the Bank of Japan has two purposes: stabilising the value of the currency, and maintaining and fostering a safe and sound financial system. These two objectives are firmly interlinked. Maintaining and fostering a safe and sound financial system is indispensable for securing the stability of the value of the currency, as a sound and stable financial market, an element of the financial system where the Bank of Japan conducts day-to-day market operations that have an immediate impact, is a requisite for the stability of the value of the currency. Similarly, the stability of the value of the currency will contribute to enhancing the financial system, for if the currency depreciates in value, the public's trust in bank deposits as well as in banknotes and coin will be threatened, thereby lessening the stability of the financial system.

In this connection, for example, BOJ-NET has been modified since November 1991 so that the Bank of Japan's operations (purchases/sales) of Treasury Bills and Financing Bills can be handled on an electronic basis. The introduction of these services has enabled the Bank of Japan to conduct open market operations in a timely and swift manner, thereby enhancing the Bank of Japan's ability to control market conditions.

#### *5.3.2 BOJ account balances for settlement purposes*

Because most of the funds transfers are settled on a designated-time basis, the BOJ account balances which banks need are relatively small compared with the case of real time gross settlement (the turnover ratio, which is defined as settlement amounts over BOJ account balances, was sixty in 1992). The existence of intraday money markets, where financial institutions extend intraday credit to each other, contribute as well to saving of BOJ account balances for settlement purposes.

Corresponding to the four designated settlement times (9 a.m., 1 p.m., 3 p.m. and 5 p.m.), there are three kinds of intraday markets: (i) starting at 9 a.m. and repaying at 1 p.m.; (ii) starting at 1 p.m. and repaying at 3 p.m.; and (iii) starting at 3 p.m. and repaying at 5 p.m.

The third type of intraday markets that connect 3 p.m. and 5 p.m. were newly created when same-day settlement was introduced in the Zengin System. Partly because of the developments

in the third type intraday markets, the transaction volumes of the intraday markets have significantly increased since March 1993 when same-day settlement of the Zengin System was realised.

## 5.4 Main projects being implemented

***Collateral to be pledged with the Bank of Japan***

The Tokyo Bankers Association (TBA) has recently implemented new risk reduction measures concerning the cap policy of the Zengin System. The new sender net debit cap will be determined by each participating bank at its own discretion to limit the amount of unsettled balances during the day. Payment instructions in excess of the cap will be rejected; then the participant concerned is to make a decision whether to retransmit or cancel the payment instruction. In line with such actions, the Bank of Japan has decided to modify the collateral arrangements which currently force every participant to deposit collateral at the Bank of Japan amounting to the daily average of its debit transfers in the previous year. Under the new collateral arrangements, each participating bank will be required to pledge collateral with the Bank of Japan in a certain proportion of the self-declared cap. The proportion of the required collateral against the cap will be low in the early stages; the proportion is to be increased in the future. The new arrangements, together with risk reduction measures taken by the TBA, are expected to give participants incentives to control settlement risks, because the lower a self-declared cap is, the smaller the collateral requirements will be.

***A DVP mechanism for settlement of government securities***

The Bank of Japan is developing a DVP system for JGBs by linking the BOJ-NET funds transfer system with the BOJ-NET JGB delivery system. The new system will achieve simultaneous settlement of the government securities and corresponding funds to eliminate principal risks inherent in the current arrangements (see Section 4.2.1.(c)). Both real-time and designated-time settlement services will be provided by the new system. The BOJ-NET users that have accounts with the Bank of Japan (i.e. banks, major securities companies, etc.) may directly participate in the system, while those who do not (i.e. smaller securities companies, insurance companies, etc.) will indirectly settle funds through their agent banks.

***The Bank of Japan's new data processing centre and back-up facility***

The Bank of Japan's new data processing centre, built in the suburbs of Tokyo in the summer of 1993, has an expanded data processing capacity which is expected to meet the increasing demand for BOJ-NET services.

As part of a plan against large-scale contingencies (e.g. blackout, fire, earthquake, etc) in the Tokyo metropolitan area, the Bank of Japan has laid out a plan for its remote back-up facility in the Osaka metropolitan area, 600 km (370 miles) west of Tokyo.

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Table 1

**Basic statistical data**

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Population (millions) ..... | 122.8 | 123.3 | 123.6 | 124.0 | 124.5 |
| GDP (nominal; JPY trillions) ..... | 371.4 | 396.2 | 424.5 | 450.8 | 464.8 |
| GDP per capita (JPY thousands) ..... | 3,024.7 | 3,213.3 | 3,434.8 | 3,635.4 | 3,733.4 |
| Exchange rate (domestic currency vis-à-vis USD): | | | | | |
| *year-end* ..... | *125.90* | *143.40* | *135.40* | *125.25* | *124.65* |
| *average* ..... | *128.20* | *138.11* | *144.88* | *134.59* | *126.62* |

*Source*: Economic Statistics Annual (Bank of Japan) and other national data.

Table 2

**Settlement media used by non-banks**[1]

(in billions of Japanese yen)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Notes and coin[2] ..... | 30,497.4 | 35,470.6 | 35,846.9 | 36,653.9 | 36,865.8 |
| Narrow money supply ($M_1$)[2] ..... | 111,844.0 | 114,473.6 | 119,628.1 | 131,044.1 | 136,138.0 |
| Broad money supply ($M_2$ + CDs)[2] ..... | 419,732.3 | 470,020.3 | 504,972.0 | 516,346.0 | 515,484.3 |
| Transferable deposits[3] ..... | 92,390.6 | 100,760.0 | 118,046.1 | 122,019.1 | 118,279.6 |
| *of which held by:* | | | | | |
| *households* ..... | *32,011.1* | *35,665.0* | *44,318.2* | *43,288.0* | *44,209.5* |
| *corporate sector* ..... | *55,804.5* | *59,927.2* | *67,906.9* | *73,140.3* | *68,094.2* |
| *other*[4] ..... | *4,575.0* | *5,167.8* | *5,821.0* | *5,590.8* | *5,975.9* |
| Postal deposits[5] ..... | 8,598.8 | 8,744.7 | 10,111.6 | 12,258.4 | 12,162.8 |

[1] Not seasonally adjusted. [2] End of year. [3] Demand deposits in yen at city banks, regional banks, regional banks II, trust banks, long-term credit banks and Shinkin banks; end of March. [4] Public sector. [5] End of March.

*Source*: Economic Statistics Annual, Economic Statistics Monthly (Bank of Japan) and other national data.

Table 3

**Settlement media used by banks**[1]

(in billions of Japanese yen)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Reserve balances held at central bank[2] ..... | 3,862.0 | 4,636.6 | 5,028.3 | 2,966.3 | 2,892.5 |
| *of which:* | | | | | |
| *required reserves* ..... | *3,858.4* | *4,630.0* | *5,024.2* | *2,962.6* | *2,889.7* |
| Transferable deposits at banks[3] ..... | 9,115.0 | 10,446.2 | 9,699.6 | 8,572.9 | 9,752.1 |
| Banks' borrowing from central bank[4] ..... | 8,473.9 | 6,945.1 | 6,303.3 | 10,267.1 | 7,218.4 |

[1] Not seasonally adjusted. [2] End of year. [3] Demand deposits in yen at city banks, regional banks, regional banks II, trust banks, long-term credit banks and Shinkin banks; end of March. [4] Banks' total borrowing from the Bank of Japan consisting of: (i) discounting of bills; (ii) loans on bills; end of year.

*Source*: Economic Statistics Annual (Bank of Japan).

Table 4

**Banknotes and coin**

(at year-end, not seasonally adjusted, in billions of Japanese yen)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Total banknotes and coin in circulation ..... | 35,180 | 40,449 | 43,017 | 43,318 | 42,511 |
| Denomination of banknotes: | | | | | |
| *10,000 yen* ..... | *27,949* | *32,728* | *34,895* | *34,787* | *33,971* |
| *5,000 yen* ..... | *1,494* | *1,639* | *1,752* | *1,844* | *1,853* |
| *1,000 yen* ..... | *2,688* | *2,867* | *2,967* | *3,069* | *3,021* |
| *500 yen* ..... | *136* | *135* | *133* | *132* | *130* |

*Source*: Economic Statistics Annual (Bank of Japan).

Table 5

**Institutional framework**[1]

| Categories | Number of institutions | Number of branches | Number of transferable accounts (millions) | Value of transferable accounts (JPY billions) |
|---|---|---|---|---|
| Central bank ..... | 1 | 34 | 0.002 | 2,892.5 |
| Commercial banks[2] ..... | 151 | 15,138 | 291.7 | 96,791.1 |
| Cooperative and rural banks[3] .. | 6,012 | 31,734 | . | 31,514.9 |
| Branches of foreign banks ..... | 88 | 142 | . | 191.3 |
| Post Office ..... | 1 | 24,190 | 84.9 | 12,162.8 |

[1] Figures at end-1992 or at end-March 1993 for the institutions other than the Post Office. Figures at end-March 1992 for the Post Office. [2] Including city banks, regional banks, regional banks II, trust banks and long-term credit banks. [3] Including Shinkin banks, credit cooperatives, labour credit associations, agricultural cooperatives, fishery cooperatives, the Norinchukin Bank and the Shoko Chukin Bank.

*Source*: Economic Statistics Monthly, Economic Statistics Annual (Bank of Japan) and other national data.

Table 6

**Cash dispensers, ATMs and EFTPOS terminals**

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Cash dispensers and ATMs: | | | | | |
| *Number of networks*[1] ..... | 68 | 71 | 75 | 27 | 26 |
| *Number of machines*[2] ..... | 68,242 | 77,337 | 87,931 | 98,599 | 108,275 |
| *Volume of transactions (thousands)* ..... | . | . | 207,564 | 297,669 | 370,588 |
| *Value of transactions (JPY billions)* ..... | . | . | 10,652 | 14,283 | 16,678 |
| EFTPOS:[3] | | | | | |
| *Number of networks* ..... | 28 | 31 | 143 | 218 | 240 |
| *Number of terminals* ..... | 698 | 1,673 | 10,170 | 26,359 | 32,816 |
| *Volume of transactions (thousands)*[4] ..... | 147 | 228 | 490 | 701 | 695 |
| *Value of transactions (JPY billions)*[4] ..... | . | . | . | 9.8 | 8.6 |

[1] End of year. [2] End of March. [3] Figures for 1988-91 include those for city banks, regional banks, regional banks II, Shinkin banks and credit cooperatives. Figures for 1992 include those for labour credit associations also. End of year for 1988-91. End of March for 1992. [4] Estimated from the transaction volume/value for December.

*Source*: Center for Financial Industry Information Systems, Federation of Bankers Associations of Japan and other national data.

Table 7

**Number of payment cards in circulation**

(in thousands)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Cards with a cash function[1] | 176,080 | 182,690 | 185,970 | 228,140 | 251,230 |
| Cards with a debit/credit function | 121,077 | 144,595 | 167,213 | 190,648 | 209,218 |
| *of which:* | | | | | |
| *cards with a debit function[2]* | *67* | *125* | *1,093* | *3,688* | *5,712* |
| *cards with a credit function[1]* | *121,010* | *144,470* | *166,120* | *186,960* | *203,000* |
| Cards with a cheque guarantee function[3] | . | . | . | . | . |
| Retailer cards[1] | 27,200 | 32,680 | 40,010 | 44,650 | 49,600 |

[1] End of March. [2] End of year. The figure for 1992 is estimated from the data available. [3] Cards with a cheque guarantee function do not exist in Japan.

*Source*: Center for Financial Industry Information Systems.

Table 8

**Payment instructions handled by selected payment systems: volume of transactions**

(in thousands)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Bill and cheque clearing systems | 394,511 | 382,060 | 382,745 | 367,124 | 350,245 |
| Zengin System | 509,146 | 574,694 | 645,246 | 718,274 | 779,083 |
| Foreign Exchange (Gaitame) Yen Clearing System | . | 4,348 | 6,270 | 6,052 | 6,119 |
| BOJ-NET | . | . | . | 3,634 | 3,710 |

*Source*: Statistics on Payment Activities in Japan (Bank of Japan, in Japanese), Economic Statistics Annual (Bank of Japan) and other national data.

Table 9

**Payment instructions handled by selected payment systems: value of transactions**

(in trillions of Japanese yen)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Bill and cheque clearing systems | 3,992 | 4,469 | 4,797 | 4,037 | 3,563 |
| Zengin System | 1,276 | 1,600 | 1,870 | 1,777 | 1,725 |
| Foreign Exchange (Gaitame) Yen Clearing System | 3,757 | 5,105 | 7,258 | 6,258 | 6,208 |
| BOJ-NET | 22,205 | 29,653 | 36,870 | 33,980 | 35,892 |

*Source*: Statistics on Payment Activities in Japan (Bank of Japan, in Japanese), Economic Statistics Annual (Bank of Japan) and other national data.

Table 10

**Transfer instructions handled by securities settlement systems: volume of transactions**

(in thousands)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Registration system[1] | 333.4 | 234.5 | 229.3 | 227.8 | 275.6 |
| Book-entry system | 161.9 | 128.7 | 205.2 | 306.5 | 391.9 |
| *Financing bills* | . | . | . | *104.6* | *131.6* |
| *Treasury bills* | . | . | . | *121.5* | *173.4* |
| *Government bonds, etc.* | . | . | . | *80.4* | *87.0* |

[1] Government bonds only.

*Source*: Statistics on Payment Activities in Japan (Bank of Japan, in Japanese).

Table 11

**Transfer instructions handled by securities settlement systems: value of transactions**

(in trillions of Japanese yen)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Registration system[1] ..... | 1,531.1 | 1,407.0 | 1,390.2 | 1,012.4 | 876.8 |
| Book-entry system ..... | 639.6 | 566.3 | 946.8 | 1,253.0 | 2,021.3 |
| *Financing bills* ..... | . | . | . | *536.2* | *710.8* |
| *Treasury bills* ..... | . | . | . | *533.9* | *1,035.3* |
| *Government bonds, etc.* ... | . | . | . | *182.9* | *275.2* |

[1] Government bonds only.

*Source*: Statistics on Payment Activities in Japan (Bank of Japan, in Japanese).

Table 12

**Indicators of use of various cashless payment instruments: volume of transactions**

(in millions)

| Instruments | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Bills and cheques cleared[1] | 394.5 | 382.1 | 382.0 | 366.4 | 349.4 |
| Payments by credit cards | . | . | . | . | . |
| Paper-based credit transfers ..... | . | . | . | . | . |
| *customer initiated*[2] ..... | 587.9 | 564.7 | 604.9 | 632.5 | . |
| *interbank/large-value* | . | . | . | . | . |
| Paperless credit transfers | . | 543.1 | 613.5 | 685.2 | 740.6 |
| *customer initiated*[3] ..... | 477.0 | 536.2 | 604.6 | 676.4 | 731.7 |
| *interbank/large-value*[4] | . | 6.9 | 8.9 | 8.8 | 8.9 |
| Direct debits[5] ..... | 1,855.9 | 1,238.9 | 1,437.5 | 1,706.6 | . |
| **Total** ..... | . | . | . | . | . |

[1] Transactions cleared through bill and cheque-clearing houses. [2] Comprising paper-based transfers through the Domestic Funds Transfer System and the Post Office. [3] Transactions through the Zengin System (excluding paper-based transfers). [4] Transactions through BOJ-NET and the Foreign Exchange (Gaitame) Yen Clearing System. [5] Direct debits for five major public utility charges (electricity, gas, water, telephone and television).

*Source*: Federation of Bankers Associations of Japan and other national data.

Table 13

**Indicators of use of various cashless payment instruments: value of transactions**

(in trillions of Japanese yen)

| Instruments | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Bills and cheques cleared[1] | 3,991.7 | 4,469.0 | 4,797.3 | 4,037.5 | 3,563.5 |
| Payments by credit cards | . | 10.0 | 13.3 | 15.7 | 17.2 |
| Paper-based credit transfers ..... | . | . | . | . | . |
| *customer initiated*[2] ..... | 49.9 | 48.4 | 54.2 | 45.7 | . |
| *interbank/large-value* | . | . | . | . | . |
| Paperless credit transfers | . | . | 25,220.0 | 37,652.6 | 39,308.6 |
| *customer initiated*[3] ..... | 1,303.8 | 1,636.3 | 1,817.7 | 1,706.3 | 1,667.3 |
| *interbank/large-value*[4] | . | . | 23,402.3 | 35,946.3 | 37,641.3 |
| Direct debits[5] ..... | 17.5 | 12.3 | 16.6 | . | . |
| **Total** ..... | . | . | . | . | . |

[1] Transactions cleared through bill and cheque-clearing houses. [2] Comprising paper-based transfers through the Domestic Funds Transfer System and the Post Office. [3] Transactions through the Zengin System (excluding paper-based transfers). [4] Transactions through BOJ-NET and the Foreign Exchange (Gaitame) Yen Clearing System. [5] Direct debits for five major public utility charges (electricity, gas, water, telephone and television).

*Source*: Federation of Bankers Associations of Japan and other national data.

Table 14

**Participation in S.W.I.F.T. by domestic institutions**

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Members | 95 | 103 | 106 | 110 | 112 |
| *of which: live* | *89* | *98* | *103* | *109* | *110* |
| Sub-members[1] | 60 | 63 | 69 | 70 | 73 |
| *of which: live* | *56* | *63* | *66* | *68* | *70* |
| Participants[2] | 3 | 5 | 7 | 7 | 8 |
| *of which: live* | *0* | *5* | *6* | *6* | *7* |
| Total users | 158 | 171 | 182 | 187 | 193 |
| *of which: live* | *145* | *166* | *175* | *183* | *187* |
| *Memorandum items:* | | | | | |
| Total S.W.I.F.T.: | | | | | |
| *members* | *1,581* | *1,697* | *1,812* | *1,963* | *2,074* |
| *sub-members* | *1,228* | *1,315* | *1,469* | *1,607* | *1,738* |
| *participants* | *27* | *37* | *63* | *78* | *91* |
| *users* | *2,836* | *3,049* | *3,344* | *3,648* | *3,903* |

[1] Domestic users sponsored by members abroad. [2] Participants are not shareholders in S.W.I.F.T. and their message traffic over the network is restricted.

*Source*: S.W.I.F.T.

Table 15

**S.W.I.F.T. message flows to/from domestic users**

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Total messages sent ..... | 10,274,039 | 17,266,969 | 15,057,485 | 15,983,025 | 17,794,807 |
| *of which:* | | | | | |
| *category I*[1] ..... | 2,097,153 | 2,643,897 | 3,119,491 | 3,654,591 | 4,206,763 |
| *category II*[2] ..... | *3,618,331* | *4,055,013* | *4,618,529* | *4,854,475* | *4,923,671* |
| *sent to domestic users* ..... | 1,278,418 | 1,822,266 | 2,302,210 | 2,254,694 | 2,363,060 |
| Total messages received ..... | 10,694,525 | 12,965,106 | 15,579,704 | 16,062,497 | 17,244,547 |
| *of which:* | | | | | |
| *category I* ..... | . | . | . | . | 2,263,207 |
| *category II* ..... | . | . | . | . | *5,739,005* |
| *Memorandum item:* | | | | | |
| Global S.W.I.F.T. traffic .. | 255,142,610 | 298,780,982 | 332,895,932 | 365,159,291 | 405,540,962 |

[1] Category I: customer (funds) transfers. [2] Category II: bank (funds) transfers.

*Source*: S.W.I.F.T.

# PAYMENT SYSTEMS IN THE NETHERLANDS

# Table of contents

## INTRODUCTION

The Dutch payment system is characterised by some specific features. In the first place, the Netherlands is very much a credit transfer or giro country. Of the cashless payments, about 90% are made by means of some form of giro transfer and 10% are made by (guaranteed) cheque. Secondly there is close cooperation between the providers in the field of transfer services. Payment services are provided by the Nederlandsche Bank and the deposit-taking institutions, including the Postbank (the former Postal Cheque and Giro Services, which offers, as far as payment and savings facilities are concerned, the same services as the other banks). The circuit of the Nederlandsche Bank is a specific circuit mainly for interbank transfers. The other two private sector circuits (that of the Postbank and that of the remaining banks) offer a wide variety of services to the customer (see Section 3). At the level of the banks' circuit, interbank cooperation is reflected in the BankGiroCentre (BGC), an automated clearing house, in which practically all the banks (with the exception of the Postbank) participate. Thirdly, processing of payments is automated to a very high degree. This does not only apply to the payments processed within the different circuits, but also to the intercircuit payments.

As far as electronic retail payments are concerned, there was little interest for a long period of time, compared with other developed countries. In recent years, however, the banks have been installing more and more ATMs. POS systems have also come into operation. Credit card payments do not play a significant role in the Dutch payment system. The vast majority of Dutch households hold one or more payment accounts. At the end of 1992 there were 15.5 million accounts, or slightly more than one per head of the population.

## 1. INSTITUTIONAL ASPECTS

### 1.1 General legal aspects

There is no general legislation governing payments in the Netherlands; the normal civil and commercial laws apply. Both coin (up to certain amount) and banknotes are legal tender. In the new Civil Code of 1992 a provision is included to the effect that a transfer payment is equivalent in law to payment in coin or banknotes.

A specific characteristic of Dutch law regards the existence of the so-called zero hour rule, which implies that, if a bankruptcy is declared, all transactions of the failing party can be nullified with a retrospective effect until 0.00 hours on the day of the verdict. The effect of the zero hour rule, however, is mitigated by the fact that Dutch law provides for compensation in a comprehensive way. Regarding the implications of the zero hour rule on the interbank payment system, it is widely assumed that, for practical reasons, the zero hour rule has no specific consequences for the operational process of interbank payments on the day of the verdict; there are, however, effects, in the stage of liquidation, on the determination of the claims and liabilities of the bankrupt's estate.

The Bank Act of 1948 contains a section which in general terms provides that the Nederlandsche Bank must facilitate domestic money transfers. On the basis of that Act the Bank closely monitors the developments with respect to payments. Moreover, the Act on the Supervision of the Credit System 1992 entitles the Bank to supervise the banking sector and, in that context, to authorise an institution to operate as a bank. As the distinguishing feature of a bank is the collection of funds from the public, which are withdrawable on demand or within a period shorter than two years, it is necessary to be a registered bank to provide payment services which imply directly withdrawable funds.

Moreover, the Second Coordination Directive of the European Community is applicable, entitling an institution which is registered as a bank in a Member State to offer payment services in the other Member States without having to be licensed in these other Member States.

## 1.2 The role of financial intermediaries

The banking sector in the Netherlands consists of commercial banks, banks organised on a cooperative basis, savings banks, the Postbank, mortgage banks and securities credit institutions. The last two types of institution will not be dealt with here, since they do not offer payment services; they have access to the payment system only through an account at a deposit-taking institution. As is the case in many other countries, the various deposit-taking institutions offer the same range of services.

### *1.2.1 Commercial banks*

There are ninety-seven commercial (universal) banks. This figure includes establishments of foreign banks dealing mainly with payments on behalf of corporate customers. The banks may offer a wide range of services to their customers; these include payment facilities, loans and mortgages, foreign exchange, stockbroking services and often also travel services. They operate in both the retail and the wholesale market. The largest are represented throughout the country and have a network of foreign offices.

### *1.2.2 Banks organised on a cooperative basis*

The 878 banks in this category operate de facto as a single institution, with Rabobank Nederland as their central organisation. The Rabobanks are strongly represented in country areas. Originally, the Rabobanks were agricultural credit institutions, but they have developed a full range of banking activities and are now also represented in the cities. Though the individual banks are independent in many ways, the products offered are completely standardised. Rabobanks are primarily retail banks, but they have now entered the wholesale market, and Rabobank Nederland also has foreign branches.

### *1.2.3 Savings banks*

The savings banks, which traditionally were non-profit institutions, are in the process of transformation into commercial banks. Though they still have a relatively strong position in the market for savings and deposits, they have gradually introduced a full range of banking services.

Some savings banks operate as a commercial bank. The other savings banks do not take part in the payment system on an individual basis but participate through the processing facilities of these banks and make settlements via their accounts at the central bank.

Many savings banks have only a regional base, but by operating their own data communication network they are able to offer services all over the country through each other's offices.

### *1.2.4 Postbank*

The Postbank is the successor of the former Postal Cheque and Giro Services (PCGS), which provided payment facilities for almost seventy years. For many years the Postal Cheque and Giro Services was by far the main institution offering payment services to private individuals. At the end of the 1960s, however, when the banks entered retail banking on a much larger scale, it faced growing competition.

The Postbank, which became a (state-owned) bank in 1985, merged with a commercial bank in 1989. Despite this merger the Postbank has kept its own circuit for payments. Since 1990 the Postbank is formally a universal bank. As far as payments are concerned, it offers the same services as the commercial banks. In 1991 the Postbank combination merged with an insurance company.

There have also been other mergers between banks as well as forms of close cooperation between banks and insurance companies.

The Dutch situation is characterised by a high degree of concentration. About 75% of private customer accounts are held with either the Postbank or the cooperative banks. On the other hand, most of the corporate customers have an account at the largest commercial bank, which also has a very strong position in cross-border payment transactions. Although the number of foreign banks is relatively high (about half of the registered banks are foreign-owned, about equally divided into EC and non-EC) their market share is not very large. In the field of payment transfers their position is in general very modest.

Besides the deposit-taking institutions offering a wide range of payment services, there are a few credit card companies.

There are no non-financial institutions offering payment services. Some retail chains offer credit-related customer services, but payment of these transactions takes place through the payment circuits of the deposit-taking institutions.

### 1.3 The role of the central bank

The Nederlandsche Bank is the central bank of the Netherlands. It is a limited liability company with the central government holding all shares. The Bank Act of 1948 secures a large degree of independence vis-à-vis the Government.

The central bank has the sole right to issue banknotes, which in fact are printed by a private company.

The Bank Act of 1948 gives the Nederlandsche Bank the responsibility for the currency circulation in the Netherlands. Notes and coin are distributed by the central bank, through its head office and its ten branches throughout the country, to banks and post offices. The often substantial amounts taken up by these institutions are debited to their current accounts with the central bank. The public subsequently obtains from the branch offices of the banks and post offices all over the country the notes and coin necessary to meet normal household expenditure, withdrawals being debited to their accounts. Cash in excess of the public's need is returned to the central bank, which is responsible for checking and replacing used notes and detecting counterfeits.

The Bank Act also contains a section which, in general terms, provides that the Nederlandsche Bank must facilitate domestic money transfers. In that respect the Nederlandsche Bank acts as a settlement institution for the banks. The settlement system is explained in more detail in Section 3.3. The Nederlandsche Bank is not involved in retail activities. On the basis of the Bank Act the Nederlandsche Bank also performs oversight on the Dutch payment system.

The Nederlandsche Bank holds the account of the Government in its capacity of cashier and the transfers relating to the Government are debited and credited to this account. In practice, particularly high-value payments like government debt issues, repayments, etc. are processed by the Nederlandsche Bank itself; the processing of more retail-like payments to and from the Government, including tax collections, takes place at the Postbank and the BGC, with the resulting debiting and crediting taking place on the account of the Government at the central bank. For payments involving relatively small amounts, the ministerial departments hold an account with banks. On these accounts no balances are held overnight.

Payments to and from local authorities are primarily dealt with by a specific bank (Bank Nederlandse Gemeenten).

### 1.4 The role of other private and public sector bodies

The Policy Committee on Payment Systems of the Dutch Banking Association is the main national consultative body regarding payment systems in the private sector. The Committee, in which the Postbank also takes part, deals on a policy level with general questions relating to the infrastructure and to both retail and wholesale products.

All Dutch deposit-taking banks participate in a common institute (BEANET), which plays a central role in relation to EFTPOS in the Netherlands, both on the level of processing the EFTPOS payment instructions and with regard to installing EFTPOS terminals.

The Steering Committee on the National Payment Circuit is responsible for the realisation of the integration of the payments circuits. It consists of representatives of the banks with the Nederlandsche Bank acting as chairman. The Ministry of Finance participates as an observer. Its aim is to raise the operational barriers between the three domestic transfer systems (Nederlandsche Bank, BankGiroCentrale-circuit and Postbank) so as to obtain an improved service at lower cost. The reason for developing the National Payment Circuit is that the Postbank, the legal successor of the Postal Cheque and Giro Services, in principle only allows transfers between Postbank accounts. For that reason banks make use of Postbank accounts for transfers between the banks' circuit and the Postbank circuit, which makes these payments relatively slow, compared to the execution and clearing of payments within each circuit, which are normally settled on a next-day basis. In 1975 the Minister of Finance, pursuant to Article 9 of the Bank Act 1948, invited the President of the central bank to chair a Steering Committee to study the integration of the three domestic transfer circuits. The National Payment Circuit project is divided into seven phases, each phase relating to a specific payment instrument. The National Payment Circuit as it is realised up till now is described in Section 3.2.

In 1991 the banks, consumer organisations and retail organisations reached an agreement about a declaration of intention regarding measures for enhancing the cost-effective use of payment services, including charging. The discussion took place within the Ad Hoc Steering Committee for Promoting Efficiency in Payment Systems, a committee without regulative authority, set up by the parties mentioned on the request of the Minister of Finance and the Minister of Economic Affairs. Both Ministries and the Nederlandsche Bank have taken part as observers. An evaluation of the measures to be taken in the context of the declaration of intention is scheduled for 1993.

## 2. PAYMENT MEDIA USED BY NON-BANKS

### 2.1 Cash payments

Banknotes and coin are the media used for cash payments. They are both legal tender, although the acceptance of coin by the public is compulsory only up to certain maximum amounts. All coin is produced by the Mint, an institution supervised by the Ministry of Finance, under the terms of the Coinage Act 1948. The Bank Act 1948 stipulates that the Nederlandsche Bank has the sole right to issue banknotes.

At the end of 1992 the currency in circulation consisted of six denominations of banknote (Fl. 1,000, 250, 100, 50, 25, 10) and eight denominations of coins (Fl. 50, 10, 5.00, 2.50, 1.00 and 25, 10 and 5 cents). The currency in circulation at end 1992 amounted to Fl. 37 billion, of which Fl. 34.5 billion was accounted for by banknotes. These figures exclude the notes and coin held by banks, which totalled Fl. 2.9 billion.

As far as the number of transactions is concerned, the average household in the Netherlands makes most of its payments in cash. However, the larger the amount involved, the greater the tendency to use credit transfers or guaranteed cheques. Although no precise figures are available,

the use of cash to pay wages, salaries, pensions and social security benefits has become rare, virtually all such payments now being effected by credit transfers. Apart from everyday expenses, cash is still used in cattle trading and in the used-car market, as well as when tax evasion plays a role.

No exact figure is available for the number of cash payments. Roughly estimated, 90% of the volume of commercial transactions is effected in cash. Their total value in 1992 has been estimated at about Fl. 555 billion.

## 2.2 Non-cash payments

### *2.2.1 Accounts*

The accounts which are used for non-cash payments are sight accounts, which can be characterised as deposit accounts, in relation to which explicit payment services are offered.

It was customary, particularly for the private customer, for little or no interest to be paid on sight accounts, while on the other hand the services were free of charge. Since a few years, a higher interest rate is paid but charges are introduced for some payment instruments.

The closest substitute for sight deposit money is money on savings accounts, which is withdrawable on demand.

### *2.2.2 Sight deposit money*

More than two-thirds of the money available to the economy for payment transactions ($M_1$) at the end of 1992 was held in the form of sight deposits with banks and the Postbank, while the remaining one-third was held in the form of banknotes and coin. There were 15.5 million sight accounts for a population of 15 million. Some 1.8 billion cashless payments using deposit money, for a total value of Fl. 3,117 billion, were made by bank and Postbank customers in 1992; transfers in the Nederlandsche Bank's books, mainly by banks, totalled approximately 0.6 million for a value of Fl. 7,860 billion.

The commercial, cooperative and savings banks together have 5,168 branch offices, all offering sight account facilities and the related payment services via the BGC (see Section 3.1). The Postbank, which has its own circuit for payments, offers its payment services through 2,300 post offices; its corporate customers make use of the branch offices of its parent company, which is a commercial bank.

Of the 1.8 billion cashless payments in 1992 the banks handled about 60% of the transfers, while the Postbank effected about 40%.

### *2.2.3 Payment instruments*

In principle, the use of payment instruments is related to a sight account.

The banks and the Postbank offer the same payment instruments. The following instruments may be distinguished:

- giro transfers (ordinary credit transfers, pre-prepared credit transfers and direct debits);
- cheques;
- cards.

Three instruments are mainly used: credit transfers, direct debits and guaranteed cheques; others, such as the credit card, play an insignificant role. Cash payments are used mainly in the personal sector for small day-to-day household purchases; as the value of the payment increases, and for all transactions in trade and industry, cashless instruments are preferred. Credit transfers are the most frequent medium used for payment of rent, insurance premiums, gas, water and electricity bills, subscriptions, etc. Wages and salaries are paid mainly by transfers to the earner's account. Transfers are also used on a large scale by public administrations.

Of every 100 giro payments dealt with by banks and post offices in 1992, 88 were transfers (99% of the total value) and 12 were cheques (1% of the total value); the proportion accounted for by payments made by holders of credit cards and other minor instruments is insignificant. In 1992 some 220 million guaranteed cheques were used for payments.

### *(a) Giro transfers*

When making an **ordinary credit transfer,** the account holder instructs his bank to debit his account with the amount indicated on his transfer order, and to credit that amount to another account, likewise indicated by him, at a bank. Practically all non-recurrent payments in trade and industry, as well as some household payments, are effected by means of ordinary credit transfers. This payment instrument is also used on a large scale by the central government and local authorities.

When used by households, the original ordinary credit transfer instruction is always in paper form; for corporate customers and government institutions it is in a non-paper-based, machine-readable form.

**Pre-prepared transfers** can be distinguished into two categories, the standing order and inpayment transfers. In the case of the standing order, the account holder gives his bank a standing order to transfer, on fixed dates, fixed amounts to an account indicated by him. This (non-paper-based) form of payment is frequently used for rent, subscriptions, insurance premiums, etc. On the fixed date the bank effects the transfer, and no further action on the part of the account holder or the payee is required. The second form of pre-prepared transfer, the inpayment transfer, is iniated by the payee. Together with his bill, he sends the payer a fully prepared transfer form, in most cases stating the payer's account number, which he knows from previous payments. All the payer has to do is to sign the form and send it to his bank. This payment medium is used for both regular and non-recurrent payments of either fixed or varying amounts, e.g. insurance premiums and subscriptions, as well as for bills for deliveries to regular customers. Unlike the standing order, this pre-prepared transfer is a paper-based instrument. In some cases the payee needs to get back the original paper form in order to be able to adjust his payer administration. For inpayment transfers, the banks and the Postbank have developed a joint procedure.

**Direct debits** constitute a separate category, though they have much in common with acceptgiro transfers. The transfer is again initiated by the payee, who has been authorised beforehand by the payer to charge his account for goods delivered or services rendered, and no further action on the debtor's part is required. This procedure is frequently used, for example, by public utilities.

The form in which transfer instructions are given is gradually changing. The share of ordinary credit transfers submitted to the banks on transfer order forms which have to be converted manually into machine-readable transfer instructions decreased from 21% of the total of bank transfer items in 1977 to 12% in 1992. This is partly due to the fact that corporate customers are increasingly using transfer instructions that are machine-readable.

Another major factor is that in the recent years the Dutch banks have become very much aware of the costs of the payment system, and the need to recover the costs by charging for payment services. As was mentioned in Section 1.4, the banks have worked out programmes in cooperation with consumer organisations and retail organisations to promote the cost-effective use of payment services.

The basic approach the banks take is that by adequate pricing and by providing information they can influence the choice of payment services resulting in lower total costs of payment services in the Netherlands. The specific pricing schemes and other cost-reductive measures are decided on by each bank itself.

### *(b) Cheques*

As a satisfactory transfer system was available to the public from an early date, the **cheque** never played a major role as a domestic payment instrument in the Netherlands. In the second half of the 1960s, however, the guaranteed cheque was introduced. The first (1967) was the guaranteed bank cheque issued by the banks for domestic use, and the second (1969) the guaranteed giro cheque of the Postal Cheque and Giro Services; the eurocheque was introduced in 1973. The guaranteed bank cheque has to a large extent been replaced by the eurocheque. The eurocheque and the guaranteed giro cheque are guaranteed by the issuing institutions for amounts up to Fl. 300; they are made available to account holders on request.

These cheques can be used only in conjunction with a cheque guarantee card carrying the card holder's account number and signature. The cheques can be used in the Netherlands for practically all purchases. In addition, the guaranteed giro cheque and the eurocheque can be used in a number of other countries for cash withdrawals (both) or purchases (eurocheques only).

### *(c) Cards*

The use of EFTPOS terminals has increased strongly in the last few years. The banks and the Postbank are cooperating in BEANET, a common company for installing POS terminals and processing POS transactions. The customer uses the same card as for guaranteed cheques.

The use of **ATMs** is growing. The banks began installing ATMs, with only a cash dispensing facility, in 1985. The customer uses the same card as for guaranteed cheques.

The use of **credit cards** is not significant, although it has increased slightly. The credit card that is most used for payments within the Netherlands is the Eurocard (Access, MasterCard), in which both the banks and the Postbank participate.

Retail chains actively promote their own **customer cards.** The volume and value of transactions are not known. Compared with the use of the payment instruments offered by the banks (and cash), however, their role does not appear to be significant.

### *2.2.4 Interbank networks accessible to customers*

The ATMs installed by a bank participating in the BGC can be used by all the customers of the other participating banks. It is expected that also a form of cooperation will arise between this network and the Postbank.

EFTPOS terminals are accessible to personal customers of both the banks and the Postbank.

There are no other intrabank or interbank networks that are accessible to customers.

#### *2.2.5 Others*

A number of banks, notably the Netherlands branches of large foreign banks, offer corporate cash management systems, including the possibility of issuing transfer instructions.

Several banks also offer systems that are suited for smaller businesses. The Postbank offers a home banking system, aiming also at private customers.

### 2.3 Recent developments

Dedicated prepaid cards have been introduced on a limited scale, for use in telephone boxes, mainly at railway stations.

The banks have jointly organised a chip card trial project in a small town. On the basis of the project, which ended in 1992, the banks have expressed an interest in a prepaid card approach, which is now under study.

Several banks are involved in EDI pilot projects, both national and international. The banks have formed a special organisation for developing payment messages based on EDI standards. Also a common infrastructure for handling EDI payments has been defined.

## 3. INTERBANK EXCHANGE AND SETTLEMENT CIRCUITS

### 3.1 General overview

Cashless payments are processed in three (interconnected) transfer circuits:

- the banks' circuit, in which the commercial, cooperative and savings banks participate;
- the circuit of the Postbank;
- the circuit of the Nederlandsche Bank.

#### *3.1.1 The banks' circuit*

The banks circuit is basically a decentralised system. It is characterised by a great variety between banks in levels of automation. In 1967 the banks formed the BGC to facilitate the collection and processing of retail transfer orders among themselves and between their own and the other transfer circuits. The system of the BGC is fully automated and is operated in two centres. Customers' transfer orders received by the banks' branch offices, insofar as they are paper-based, are converted by them into machine-readable data carriers, nowadays practically always magnetic tape. The data carriers are sent to the BGC, where the information is processed to produce for each individual bank a machine-readable data carrier, containing all the credits to accounts of that particular bank's customers. Besides interbank transfers the BGC also processes the major part of intrabank transfers. The banks that participate in the BGC circuit have a common account number system, which allows for an automated number check.

The BGC system comprises in fact two systems: the BankGiro system for bulk payments and BGC-Spoedcircuit for urgent transactions.

It should be noted that the BGC is merely an intermediary between the participating banks. It receives transfer orders and converts them into (debit and) credit items, for individual banks and account numbers, by means of an automated system. The BGC has no relationship with bank customers; it does not know the balances on accounts, makes no entries in accounts and,

consequently, does not itself produce statements of account. It is the individual banks themselves which, using automated processes, make the actual debit and credit entries in the accounts and produce the statements of account, which they send to their customers.

Although each bank has its own internal processing system for in-house payments, the BGC is not only used for exchanging payments with other banks, the Postbank circuit and the Nederlandsche Bank, but also for processing intrabank payments for banks which choose to do so. It is clear that these purely technical operations of the BGC must be followed by financial settlement. For this purpose, the participating banks have authorised the BGC to effect on a net net basis the daily settlement payments at the Nederlandsche Bank; the account of each bank is debited or credited with the difference between its total debit and credit items. The BGC-Spoedcircuit payments are settled in a special way. This system, in which the transaction amounts are relatively high compared with normal retail payments, is a guaranteed payment system. The system works on the basis of a collateralised credit facility which is split off from the facility which the participating banks have at the central bank. The formal settlement at the central bank takes place once a day.

With the exception of the Postbank, all Dutch deposit-taking institutions participate in the BGC. The way in which the BGC functions leads the public to view the banks' transfer system as a single whole.

### *3.1.2 The circuit of the Postbank*

Although the Postbank merged with a commercial bank in 1989, the payment system of the Postbank remains separated from the BGC circuit, in which the merger party to the merger participates. There is, however, a process of integration that takes place within the context of the National Payment Circuit project (see Section 3.2).

Processing at the Postbank is characterised by a high degree of centralisation, all payment items being processed in three central offices, and by a high level of automation. The booking process in these centres is divided into two stages: first one in which the accounts are debited and then one in which they are credited.

Prior to this process, the paper-based payment orders are converted into machine-readable data. More and more users, however, present their order for credit transfer or direct debits in the form of magnetic tapes.

Most of the booking procedure in the three centres is automated. One of the characteristics of the booking process is the check on the relation between the name of the payee and the credit account number.

### *3.1.3 The circuit of the Nederlandsche Bank*

The circuit of the Nederlandsche Bank embraces only a limited group of account holders, mainly banks, securities dealers and the public authorities. It operates through a centralised on-line system, which completes all transfer orders on the day of receipt. Statements of account are in the possession of the participants on the following day. The Nederlandsche Bank's circuit serves as the final settlement system for the other two systems. In addition to its role as a settlement institution, the central bank acts as cashier for the central government; transfers effected in that capacity in 1992 amounted to approximately Fl. 1,200 billion. The system is described in more detail in Section 3.3.1.

### *3.1.4 Exchange circuits, clearing and settlement of transfers*

As already noted, transfers effected by the banks through the BGC are netted, so that an institution will either owe or receive a net amount.

Clearing figures are presented to the central bank via its on-line system and settled at about 13.00. To effect settlement, the BGC has been authorised by the banks to make entries in their accounts with the central bank. The results of the BGC clearing are settled in combination with the clearing results of the 8007 system, the large-value payment system involving non-resident accounts (see 3.3.2). The reason for combining these settlements is that in this way the liquidity effects can be levelled in an effective way.

Besides these clearing results, the results of the BGC system for urgent payments and the results of the central bank clearing system for CPs, CDs and MTNs (see 4.2) are also settled at the central bank at 14.00 and 13.00, respectively (MTNs at 8.00).

Other items which are not exchanged by the banks through the BGC, for instance payments stemming from money market transactions, are presented via the on-line system of the central bank directly by the banks themselves.

Items from the banks' circuit for the Postbank circuit are also passed through the BGC. Settlement of these items is effected through an account held by the BGC with the Postbank. This account is regularly replenished through a payment in the books of the Nederlandsche Bank.

In principle, payments from a Postbank account holder to a bank account holder are made through accounts that banks hold at the Postbank. Ultimately, the amounts are withdrawn from the Postbank circuit through payments to bank accounts from the Postbank account in the circuit of the Nederlandsche Bank. However, for payments processed according to National Payment Circuit standards this procedure does not apply.

## 3.2 National Payment Circuit

As stated in Section 1.4, the National Payment Circuit project, which aims at a technical integration of the three payment circuits, is divided into seven phases. Each phase relates to a specific payment instrument. At the moment the first four phases have been realised, implying that machine-readable credit transfers, inpayment transfers, cheques and direct debits are processed according to the project standards. The main implications are that for these types of payments it is sufficient to have an account in only one of the circuits and that there is no settlement time difference, regardless whether or not the accounts involved are held in the same circuit. Interbank settlement for these payments takes place on accounts at the Nederlandsche Bank, where before it took place on accounts at the Postbank.

## 3.3 Overview of the major large-value systems

At present, there are two large-value funds transfer systems in the Netherlands. One is the central bank's current account system, which is commonly used for normal large-value guilder payments; the other is the 8007 system.

### *3.3.1 The Nederlandsche Bank's current account (FA) system*

#### *(a) General overview*

The purpose of the Nederlandsche Bank's current account system is to offer central bank current account facilities to banks and to the Government, thus permitting the settlement of payment transactions.

There are no restrictions on the value of transactions. The system handles only credit transfers; it processes irrevocable payment orders on a gross basis and, to a lessening extent, revocable orders.

The transactions volume has remained relatively stable since 1965, when approximately 1 million transactions were processed. By 1970 this volume had increased to 2 million transactions, but it has recently declined, to a level of 0.6 million transactions in 1992. The total value of transactions processed in 1992 was Fl. 7,860 billion. The average value per transaction was thus Fl. 13.8 million.

### *(b) Major legislation, regulations and policies*

The current account system operates under the Bank Act 1948, which requires that the Nederlandsche Bank facilitates the payments mechanism in the Netherlands. The Bank also determines who can use the transfer system. All authorised institutions are eligible for participation, including Dutch-based subsidiaries of foreign banks. Generally, banks outside the Netherlands cannot participate, except for banks to which the Second Coordination Directive of the European Community is applicable. The rules are the same for all participants.

The system operates from 8.00 to 15.30 for transactions for same-day settlement. Transactions to be effected on a later day, as far ahead as one month, may be entered until 17.00.

The basic rule is that a sending participant must have adequate cover for debits on his current account (i.e. a credit balance or an unused - collateralised - overdraft facility) before a transfer is effected. Unsecured credit is precluded. The Bank draws up and enforces the rules and regulations of the transfer system and is responsible for any changes in the structure of the system.

### *(c) Participants*

The Nederlandsche Bank owns, operates and controls its current account system. It also participates in the system, along with most credit institutions registered at the Bank, some bill-brokers, the Treasury, foreign central banks and international institutions. In addition, some accounts are held by large companies and pension funds; the latter, however, in principle do not have access to the credit facilities, and their use of the transfer system is limited, primarily to money and capital market transactions.

Though most banks themselves hold an account at the Nederlandsche Bank, the BGC also holds an account at the Bank for the settlement of its payment clearing activities.

### *(d) Types of transaction handled*

The current account system is designed to execute transfer orders in guilders. The system provides for both revocable and irrevocable transfer orders. At the end of each business day all revocable orders become irrevocable, provided there is sufficient cover on the payer's current account. If not, the Bank cancels revocable payment orders to the extent necessary.

The current account transfer system is used mainly for credit transfers resulting from interbank money market transactions, for funds transfers by the Government and for settling customer transactions processed at the BGC and the Postbank.

The Nederlandsche Bank is not involved in retail activities.

### *(e) Operation of the transfer system*

As mentioned above, transactions can be either revocable or irrevocable. Irrevocable transfer are on-line, real-time gross transfers, and the payee receives the funds immediately. In the case of revocable transfers the transfer is processed, but the payee has to wait until the cut-off time at the end of the day (15.30) before he can be sure that he will actually receive the funds. During the

day, however, participants can inquire on-line about the funds transferred to their account by means of revocable orders.

All transfers submitted by the BGC resulting from the clearing are entered as irrevocable orders. Several other types of transactions are also paid irrevocably, such as payments for cash deliveries and repayments on public loans. Besides, the Bank itself and the Government in principle always pay irrevocably. In addition, amounts up to Fl. 11 million must always be paid irrevocably. The level may later be raised in accordance with the central bank's aim for finality in the payment system.

### *(f) Transaction-processing environment*

In 1992, electronic transfers accounted for approximately three-quarters of the transaction volume in the current account system. The system now averages about 2,300 transactions per day, although peak capacity is about 18,000 transactions per day. With the support of backup facilities, the Bank seeks to achieve 100% reliability.

Transfer orders can be submitted on paper, magnetic tape or electronically. The on-line participants in the system enter transactions at remote terminals via dedicated leased-line connections to the central computer. Off-line participants send their orders on magnetic tape or paper; the latter are partly on coded telex messages and are entered into the system by the Nederlandsche Bank itself.

### *(g) Pricing policies*

In principle the Bank's aim is cost-recovery. However, given the relatively small transaction volume, total revenue collected does not fully cover the costs. Though fees are lower than the actual costs, they vary depending on the media used. For example, for on-line transactions lower fees are charged than for off-line transactions. Participants' fees cover only a small portion of the Bank's operating expenses, which include personnel, facilities and data-processing costs; the Bank bears the remaining operating expenses. It must be borne in mind, however, that the Bank itself is also a user of the system. In addition to transaction fees, the participants incur operating and equipment costs and have to pay for their electronic connections.

The Bank charges each account holder a fixed annual fee (Fl. 1,500) per account. In addition, transaction fees are charged, which differ in price according to the medium used. The Bank also charges for other miscellaneous services provided to the participants.

### *(h) Settlement procedures*

In principle, every credit institution registered as such has an account at the Nederlandsche Bank. Provided there is sufficient cover for debiting the current account, settlement is effected by adjusting the participants' accounts in the books of the Nederlandsche Bank.

Since all transfer orders are effected only if sufficient cover is available, irrevocable transfers are never unwound. Revocable transfer orders are removed from the system at the end of the day if no sufficient cover is available. In such a case the Nederlandsche Bank contacts the payer, requesting that the required funds be raised on the money market. If the participant cannot obtain sufficient funds, the Bank selectively deletes revocable payment orders until the cover is sufficient. So far this procedure has not led to any problems in the system.

### *(i) Credit and liquidity risks and their management*

No specific rules for finality have been laid down; normal civil law is applicable. Payments are considered final the moment they are settled at the central bank, which for irrevocable

orders is upon entry and validation and for revocable orders at the cut-off time at the end of the working day. While there is no liquidity risk within the central bank's current account system since irrevocable orders are only carried out in case of sufficient funds, the possibility of revocable orders being cancelled at the end of the day may cause problems of a systemic nature within the banking system. To solve this problem it is planned to gradually abolish revocable payment orders.

All financial institutions holding an account at the Bank may send credit transfers. Neither the financial institutions nor the central bank bear risk in the system since transfers are effected only if sufficient debit cover is available in the participant's current account. Of course, financial institutions are exposed to credit risk if (in the case of revocable orders only) they decide to provide funds to their customers before final settlement has taken place.

### *3.3.2 The 8007 system*

(The 8007 S.W.I.F.T. system is named after the code used for the balance-of-payments reporting of these items.)

#### *(a) General overview*

The function of the 8007 system is to process guilder payments to or from a non-resident client (bank or non-bank), in case payer and payee do not have an account at the same bank. The system, which operates on a net settlement basis, also conducts the clearing and reporting of those non-resident related transactions to the central bank.

Originally the system was operated by the BGC. Because of the large-value character of the payments involved, it was agreed to have this system operated by the Nederlandsche Bank.

Since February 1993 the Nederlandsche Bank processes the 8007 payments.

When the system came into effect in 1982, 350,000 transactions were processed, and by 1992 this number had grown to about 1.8 million. In 1992 the total transaction value was Fl. 8,055 billion and the average transaction value was Fl. 4.5 million.

#### *(b) Major legislation, regulations and policies*

The same rules that apply to the Nederlandsche Bank current account system also apply here. All banks registered at the Nederlandsche Bank can participate. In principle, all orders entered before the cut-off time (11.30) are processed the same day.

#### *(c) Participants*

In principle, all authorised banks in the Netherlands participate in this system. The Nederlandsche Bank is also a participant in the system.

#### *(d) Types of transaction handled*

The system is a credit transfer system. It processes guilder payments from or to an account held by a non-resident, for example a foreign bank, at a Dutch bank.

#### *(e) Operation of the system*

The system is a net settlement system. The Nederlandsche Bank calculates the net net positions and takes care of the balance-of-payments information.

### *(f) Transaction-processing environment*

The processing of the 8007 payments is integrated in the current account system; it uses the same central processing unit at the Nederlandsche Bank. Though transfer orders may be submitted on magnetic tape, they are entered primarily by data communication; they are processed batchwise. To facilitate efficient handling of international payments, the S.W.I.F.T. message format is used. The delivery of input and output messages takes place via the BGC, except for the Postbank. The cut-off times for the submission of orders on magnetic tape and by data communication are 9.00 and 11.30, respectively.

### *(g) Pricing policies*

The basic pricing policy is that the system should be self-financing. In practice, this means that a certain amount is paid per transaction and per batch, by both sender and receiver.

### *(h) Settlement procedures*

The results of the day's clearing are calculated by the Nederlandsche Bank and integrated with the results of the clearing of the normal domestic customers' transactions as processed by the BGC. The total is settled at 13.00. As is the case for the current account system of the Nederlandsche Bank, settlement is subject to sufficient cover for net net debit positions. The actual settlement is effected by adjusting the participants' accounts in the books of the Nederlandsche Bank. If available cover is insufficient to book the result of the clearing, the bank involved has to find additional means, for instance in the money market. If it should not succeed, in theory, the clearing should be unwound. This has never happened so far.

### *(i) Credit and liquidity risks and their management*

The moment at which transferred funds are available depends upon whether the beneficiary has an account at the central bank. If the beneficiary is the receiving bank, the funds transferred are available after the settlement payment has taken place within the central bank's current account system. If the beneficiary holds a customer account at the receiving bank, the moment when the funds are made available is determined by the bank.

The 8007 system does not allow for the return of payments. There is, however, a procedure whereby the recipient of a wrongly processed order can be requested and obliged, up to a certain point in time, to submit an offsetting order.

There are no specific rules for finality; normal civil law is applicable. Payments are considered final the moment they are settled at the central bank.

In principle, credit plays no role in the 8007 system. Credit can, however, be supplied by a bank if the funds are made available to a customer before they have actually been paid for in the settlement. However, it has been agreed between the central bank and the banks that this should not occur. Therefore the system itself does not give rise to credit risk, but it may lead to credit risk. Such risk occurs only when financial institutions allow their customers to make use of funds before all transfers are finally settled.

## 3.4 Main projects and policies being implemented

The central bank is working on a new current account system, which is scheduled to become operational in 1995. The aim is to create fully automated real-time processing of all large-value transfers in an integrated way with a queuing facility in order to reach a situation of only irrevocable final payments.

The main focus of the central bank regarding the project is the aim for risk reduction in the Dutch payment system. Since, at the same time, the BGC is building a new system, an effective way of division of processing activities is striven for.

## 4. SPECIAL USE OF INTERBANK TRANSFER SYSTEMS FOR INTERNATIONAL AND DOMESTIC FINANCIAL TRANSACTIONS

### 4.1 Exchange and settlement systems for international transactions

As far as payment of international transactions is concerned, the Dutch banks use their foreign offices as well as correspondent banks where possible.

The payment instructions are mainly sent through S.W.I.F.T. Therefore a large number of banks hold membership of S.W.I.F.T. The other banks, which jointly hold a very marginal share in international payments, take part through a S.W.I.F.T. member bank.

Concerning the payment of international transactions, a distinction can be made between payments that are connected with face-to-face transactions abroad and non-travel-related remote payments. The first category of payments includes, apart from cash, particularly credit card payments, cheques and cash dispenser transactions.

Credit card payments are settled through the credit card company or the bank involved, whichever is the case.

Cheques written in the Netherlands by clients of foreign banks are, in the case of eurocheques, collected at the BGC and sent through Eurocheque International to the clearing institute in the country of issue, whereupon the BGC is credited. Eurocheques written out abroad by clients of Dutch banks are settled in a similar way.

Postcheques, which are issued by the Postbank, can be cashed abroad only at post offices. Postcheques written abroad are collected by the giro institution in the country concerned and are subsequently sent to the Postbank, which credits the giro institution concerned. Postcheques written in the Netherlands by clients of a foreign giro institution follow the same procedure.

The procedure for cheques is also applied to the settlement of cash dispenser transactions of customers of foreign and Dutch banks respectively.

Travel-related payments account for the major part of international payments, at least as far as the number of transactions is concerned.

Regarding the turnover, the category of the non-travel-related payments is much more important. This category includes, besides trade cheques, the international credit transfers. These are, as stated above, mainly sent through S.W.I.F.T. to the correspondent bank.

Settlement of guilder payments from abroad is, in case the beneficiary does not hold an account at the Dutch correspondent bank of the payer, effected through the 8007 system, which is discussed in 3.3.2.

### 4.2 Exchange and settlement systems for securities transactions

The system for exchanging securities is principally a giro system. It is based on a specific law. The securities themselves are mainly kept in safe custody by Negicef, the Dutch central securities depository owned by the Stock Exchange Association, the banks and the central bank (each with a one-third holding). The depository records the right to a specific amount of securities.

There are two circuits for securities trading. The first circuit is the circuit of the Amsterdam Stock Exchange. At the end of the trading day the transactions are cleared on a multilateral basis, whereby the Effectenclearing becomes the new counterparty of the buyer and the seller. In this way the Effectenclearing can guarantee both delivery and payment. Seven calendar days after the transaction date, settlement takes place by delivering the securities at the Necigef account of the Effectenclearing, which will pass them on to the buyer. The financial settlement is effected by the Effectenclearing at the Kas-Associatie, a specialised banking institution, which is a 60% subsidiary of the Stock Exchange Association. The irrevocable recording of the change of ownership at Negicef takes place after authorisation from the Kas-Associatie. In this procedure settlement takes place on the basis of DVP. Initiatives have been taken to implement a lending facility, in order to enable the Effectenclearing to fulfil its obligations.

In the Netherlands there are also two derivatives exchanges, the Optiebeurs (European Option Exchange) and the Financiële Termijnmarkt Amsterdam (Financial Futures Market Amsterdam) and their clearing corporations. Settlement takes place via clearing members of the exchange. In case payment is in guilders, transactions are settled on accounts at the Kas-Associatie. If payment is in other currencies, transactions are settled on correspondent accounts of the Kas-Associatie or the Option Exchange at foreign banks. If the contract results in delivery of securities, the Effectenclearing is involved. Settlement then takes place on the basis of DVP, following the procedure described above. In case the contract results in the delivery of gold, a foreign depository is involved. The premium for the contracts has to be paid one day after the transaction has taken place.

Beside these types of transactions there is direct trading between members of the Stock Exchange, particularly banks, and institutional investors (domestic and foreign), whereby the (custodian banks of the) contracting parties themselves instruct Negicef. These so-called Amsterdam Interprofessional Market transactions generally involve large amounts (exceeding Fl. 1 million for share transactions and Fl. 2.5 million for bonds). In this circuit, netting does not take place. Each transaction is paid for separately. The payments are in most cases effected via the central bank, on the initiative of the parties.

At the request of the banks, the central bank acts as clearing institute and as depository for the money market instruments CP (commercial paper), CD (certificates of deposit) and MTN (medium-term notes). These instruments have a large, fixed value (Fl. 1 million) and they are traded within the professional circuit. The administrative system of securities ownership is fully giro-based. Clearing and settlement takes place on a same-day basis and, for CDs and CPs, the trade date can be the same as the settlement date. This point is of particular importance because of the money market aspect of the instruments concerned. A particular type of commercial paper that is cleared and deposited in the same way is Treasury bills. The central bank also acts as settlement bank and depository for strips of treasury bonds. Settlement takes place by delivery versus payment on a trade for trade basis. In addition to members of the Stock Exchange also other, foreign, professional parties, like brokers and custodians, can participate directly in this trade.

# 5. THE ROLE OF THE CENTRAL BANK IN INTERBANK SETTLEMENT SYSTEMS

## 5.1 General responsibilities

As stated above, on the basis of the Bank Act the central bank plays an active role, both on the operational side, in settling payments, and in the development of the Dutch payment system in general. As far as the latter is concerned, its role in promoting the integration of the Dutch payment circuits has already been mentioned.

In the autumn of 1987 the central bank, pursuant to the Bank Act, issued a memorandum describing four aspects which in its view form the basic principles with respect to the development of the payment system in the Netherlands. They are:

- uniformity of the infrastructure: this prevents waste and makes the giro system more comprehensible to all its users;
- cost coverage: payment services as a product should be self-financing for every bank. Moreover, the pricing of services should foster the use of the more efficient among them;
- product conditions: everyone should be able to have access to the payment system, and the services should be transparent for the customer;
- fraud and security: special attention should be devoted to fraud and the security of the payment system.

Another main policy element is the concern for the risks in the payment system and the aim for finality. The main approach that the Nederlandsche Bank takes regarding risk reduction in the payment system is by ensuring that large-value interbank payments in principle will take place more and more in its own current account system.

As regards the risks stemming from automated processes, the Bank has issued a memorandum, with guidelines for the organisation of the automation processes of the banks.

As explained, the Nederlandsche Bank supervises the banks. In this respect the banks' activities relating to payment services come into perspective. This does not, however, imply that the Nederlandsche Bank explicitly supervises or audits the interbank funds transfer systems, although it discusses, within the framework of oversight, general policy questions with the BGC.

Regarding the settlement of securities, the Nederlandsche Bank closely follows the developments in this field in view of the possibility of systemic risks in relation to the payment system. Where this seems useful, the Bank also offers securities settlement services itself.

As far as its own current account system is concerned, the Bank obviously controls and audits the system.

## 5.2 Provision of settlement facilities

The central role of the Nederlandsche Bank in the settlement process of interbank payments has already been mentioned in Section 3.3.

Moreover its role in the settlement of securities transactions was explained in Section 4.2.

Given its concern for the payment risks, the Bank strives in the first place for finality in its own payment system, as is explained in Section 3.3.

The taking-over of the 8007 system - the large-value system for foreign guilder payments, which were originally processed at the BGC - can be seen against this background. A third important system in this respect is the system of the BGC banks for urgent payments. This payment

system, in which the transaction amounts are relatively high compared to normal customer payments, is a guaranteed payment system. The system works on the basis of a collateralised credit facility which is split off from the credit facility which the participating banks have at the central bank.

It is the aim of the Nederlandsche Bank that payments in the different systems are settled in a coherent way.

As explained, the clearing results of the BGC system for bulk payments are also settled in the system of the central bank. Although it is a position netting system and the central bank is concerned about the legal status, Dutch law makes it difficult to transform it into an obligation netting system.

As regards the payments taking place in the current account system of the central bank, the general policy is that each financial institution must ensure that its credit balance or credit facility is sufficiently large to allow its transfer orders to be executed. If necessary, bankers may borrow from and lend to one another in order to acquire funds to initiate irrevocable transfers during the day.

All banks supervised by the Nederlandsche Bank and listed as such in its register of credit institutions are, in principle, eligible for credit facilities granted by the Bank. Such credit is secured by collateral. The conditions for usage of the credit are determined by monetary policy considerations.

In order to enable foreign banks to participate in the Dutch payment system in a cost-effective way, it is possible to hold part of the collateral needed in foreign securities (government bonds of the countries that participate within the narrow band of the EMS).

Financial institutions hold practically no balances on their current accounts, which do not bear interest. The pricing of the central bank's settlement facilities has been explained in Section 3.3.

### 5.3 Monetary policy and payment systems

In addition to its involvement in general policy with respect to payment systems and its supervisory function, the Bank is also concerned with the monetary policy issues relating to payment systems. Basically, the aim of monetary policy is to manipulate the money market interest rate in such a way that a stable relation is maintained between the Dutch guilder and the Deutsche Mark. This is done by limiting the amount of credit each bank can take up at the official rate for advances and by fine-tuning through the interest rate for short-term special advances.

As far as the practical relation between monetary policy and the payment systems is concerned, the credit system offers much flexibility. The basic idea in the system is that on the one hand the banks can take up intraday credit according to the value of the collateral deposited, while on the other the overnight credit amount is limited on the basis of an average amount for a three-month period.

Since this allows the banks to decide themselves about their daily use of credit, it creates the possibility for absorbing daily fluctuations, stemming from a concurrence of circumstances in the payment systems.

Though as a rule the Bank sets the financial institutions' combined credit limits sufficiently large to provide them with the necessary liquidity, the volume of credit granted by the Bank is subject to monetary policy considerations, and as a result the functioning of the current account system can in principle be influenced by monetary policy measures.

Furthermore, the central bank looks after the possible influence of changes in payment systems on monetary policy. For that reason the implications in this respect of any future steps towards enhanced finality are being thoroughly analysed, not only regarding the consequences for the availability of liquidity in the central bank system, but particularly also in relation to the effects on money market interest rates.

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Table 1

**Basic statistical data**

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Population (millions): | | | | | |
| *year-end* ..... | *14.7* | *14.8* | *15.0* | *15.1* | *15.1* |
| GDP (NLG billions) ..... | 447.8 | 474.2 | 506.3 | 535.9 | 564.6 |
| GDP per capita ..... | 30,463.0 | 32,041.0 | 33,753.3 | 35,490.1 | 37,390.0 |
| Exchange rate (domestic currency vis-à-vis USD): | | | | | |
| *year-end* ..... | *1.98* | *1.92* | *1.69* | *1.71* | *1.81* |
| *average* ..... | *1.98* | *2.12* | *1.82* | *1.87* | *1.76* |

Table 2

**Settlement media used by non-banks**

(at year-end, not seasonally adjusted, in billions of Dutch guilders)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Notes and coin ..... | 34.6 | 36.0 | 36.5 | 37.0 | 37.0 |
| Transferable deposits ..... | 76.7 | 83.0 | 87.5 | 92.3 | 98.1 |
| *of which held by:* | | | | | |
| *households* ..... | . | . | . | . | *37.8* |
| *corporate sector* ..... | . | . | . | . | *59.1* |
| *other (government)* ..... | *1.5* | *1.1* | *0.9* | *1.9* | *1.1* |
| Narrow money supply ($M_1$) ..... | 111.3 | 119.0 | 124.0 | 129.3 | 135.1 |
| Broad money supply ..... | 359.3 | 393.9 | 419.9 | 411.5 | 435.0 |

Table 3

**Settlement media used by banks**

(at year-end, in millions of Dutch guilders)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Reserve balances held at central bank | 129 | 31 | 17 | 116 | 32 |
| Transferable deposits at other institutions | 4 | 2 | 4 | 3 | 2 |
| *Memorandum items:* | | | | | |
| Required reserves | 1,698 | 6,078 | 6,605 | 0 | 12,484 |
| Institutions' borrowing from central bank | 6,334 | 6,240 | 8,503 | 2,799 | 5,041 |

Table 4

**Banknotes and coin**

(at year-end, not seasonally adjusted, in millions of Dutch guilders)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Total banknotes and coin issued | 36.8 | 38.7 | 39.4 | 39.9 | 39.9 |
| Denomination of banknotes: | | | | | |
| *1,000 guilders* | *15.2* | *15.5* | *15.4* | *15.5* | *15.1* |
| *250 guilders* | *3.3* | *3.8* | *4.1* | *4.2* | *4.3* |
| *100 guilders* | *12.5* | *13.0* | *13.4* | *13.6* | *13.8* |
| *50 guilders* | *1.1* | *1.3* | *1.4* | *1.5* | *1.6* |
| *25 guilders* | *1.7* | *1.9* | *1.8* | *1.7* | *1.7* |
| *10 guilders* | *0.7* | *0.7* | *0.7* | *0.7* | *0.7* |
| *5 guilders* | *0.2* | *0.1* | *0.07* | *0.06* | *0.06* |
| Banknotes held by credit institutions | 2.2 | 2.6 | 2.9 | 2.9 | 2.9 |
| Total banknotes outside credit institutions | 34.6 | 36.0 | 36.5 | 37.0 | 37.0 |

Table 5

**Institutional framework**

(at end-1992)

| Categories | Number of institutions | Number of branches | Number of accounts (millions) | Value of accounts (GBP billions) |
|---|---|---|---|---|
| Central bank ..... | 1 | 10 | 0.004 | 3.3 |
| Commercial banks ..... | 86 | 2,678 | 4.1 | 52.4 |
| Savings banks ..... | 44 | 434 | 0.6 | 2.0 |
| Cooperative and rural banks ... | 1 | 2,056 | 4.6 | 24.6 |
| Postbank ..... | 1 | 2,300 | 6.2 | 19.0 |
| *Memorandum item:* | | | | |
| Branches of foreign banks . | 23 | | | |

Table 6

**Cash dispensers, ATMs and EFTPOS terminals**

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Cash dispensers and ATMs: | | | | | |
| *Number of networks* ..... | *2* | *2* | *2* | *2* | *2* |
| *Number of machines* ..... | *1,017* | *1,839* | *2,700* | *3,354* | *3,964* |
| *Volume of transactions (millions)* ..... | . | . | *168* | *355* | *487* |
| *Value of transactions (NLG billions)* ..... | . | . | *26* | *60* | *82* |
| EFTPOS: | | | | | |
| *Number of networks* ..... | *3* | *3* | *2* | *2* | *2* |
| *Number of terminals* ..... | *1,495* | *2,047* | *2,223* | *4,038* | *11,440* |
| *Volume of transactions (millions)* ..... | . | *17* | *27* | *32* | *47* |
| *Value of transactions (NLG billions)* ..... | . | *0.7* | *1.3* | *1.8* | *3.8* |

Table 7

**Number of payment cards in circulation**

(at year-end, in thousands)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Cards with a cash function ..... | . | 7.717 | 8.371 | 9.273 | 12.538 |
| Cards with a debit/credit function ..... | . | 0.956 | 0.8555 | 1.950 | 1.500 |
| *of which:* | | | | | |
| *cards with a debit function* ..... | . | . | . | . | *1.500* |
| *cards with a credit function* ..... | . | . | . | . | . |
| Cards with a cheque guarantee function ..... | . | 1.882 | 1.998 | 2.213 | 1.7648 |
| Retailer cards ..... | . | . | . | . | . |

Table 8

**Payment instructions handled by selected payment systems: volume of transactions**

(in millions)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| BankGiroCentre ..... | 808.2 | 895.8 | 944.1 | 992.6 | 1,043.7 |
| *cheques* ..... | *127.0* | *118.2* | *114.6* | *110.5* | *91.7* |
| *other* ..... | *681.2* | *777.6* | *829.5* | *882.1* | *952.0* |
| 8007 S.W.I.F.T. ..... | 0.8 | 0.9 | 1.4 | 2.0 | 1.8 |
| Central bank current account system (FA) ..... | 0.8 | 0.8 | 0.8 | 0.5 | 0.6 |

Table 9

**Payment instructions handled by selected payment systems: value of transactions**

(in billions of Dutch guilders)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| BankGiroCentre ..... | 1,463.4 | 1,566.0 | 1,711.9 | 1,851.8 | 1,942.0 |
| *cheques* ..... | *16.4* | *16.0* | *16.5* | *16.2* | *15.3* |
| *other* ..... | *1,447.0* | *1,550.0* | *1,695.4* | *1,835.6* | *1,926.7* |
| 8007 S.W.I.F.T. ..... | 2,196.5 | 2,947.3 | 5,252.9 | 7,862.0 | 8,055.0 |
| Central bank current account system (FA) ..... | 9,730.0 | 10,354.0 | 10,137.0 | 6,765.0 | 7,860.0 |

Table 10

**Transfer instructions handled by securities settlement systems: volume of transactions**

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Amsterdam Stock Exchange ..... | . | . | . | . | . |
| Central bank clearing institute for money market paper ..... | 0.002 | 0.004 | 0.004 | 0.003 | 0.002 |

Table 11

**Transfer instructions handled by securities settlement systems: value of transactions**

(in billions of Dutch guilders)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Amsterdam Stock Exchange ..... | 182.7 | 170.0 | 179.0 | 234.0 | 303.6 |
| Central bank clearing institute for money market paper ..... | 15.3 | 45.2 | 42.1 | 21.7 | 16.2 |

Table 12

**Indicators of use of various cashless payment instruments: volume of transactions**

(in millions)

| Instruments | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Cheques ..... | 278.0 | 267.0 | 260.0 | 247.0 | 222.0 |
| Credit and debit cards ..... | 5.0 | 17.0 | 27.0 | 32.0 | 47.0 |
| Paper-based credit transfers ..... | 91.0 | 101.0 | 102.0 | 98.0 | 105.0 |
| *customer initiated* ..... | *91.0* | *101.0* | *102.0* | *98.0* | *105.0* |
| *interbank/large-value* | *0.0* | *0.0* | *0.0* | *0.0* | *0.0* |
| Paperless credit transfers | 930.0 | 965.0 | 956.0 | 963.0 | 1,003.0 |
| *customer initiated* ..... | *928.0* | *963.0* | *954.0* | *960.0* | *1,001.0* |
| *interbank/large-value* | *1.6* | *2.0* | *2.0* | *3.0* | *2.4* |
| Direct debits ..... | 263.0 | 329.0 | 360.0 | 392.0 | 431.0 |
| **Total** ..... | 1,567.0 | 1,679.0 | 1,705.0 | 1,732.0 | 1,808.0 |

Table 13

**Indicators of use of various cashless payment instruments: value of transactions**

(in billions of Dutch guilders)

| Instruments | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Cheques ..... | 36.0 | 36.0 | 35.0 | 33.0 | 32.0 |
| Credit and debit cards ..... | 0.2 | 0.7 | 1.3 | 2.0 | 3.8 |
| Paper-based credit transfers ..... | 40.0 | 41.0 | 48.0 | 45.0 | 48.0 |
| *customer initiated* ..... | *40.0* | *41.0* | *48.0* | *45.0* | *48.0* |
| *interbank/large-value* | *0.0* | *0.0* | *0.0* | *0.0* | *0.0* |
| Paperless credit transfers | 16,373.0 | 15,904.0 | 18,142.0 | 17,032.0 | 18,741.0 |
| *customer initiated* ..... | *4,746.0* | *2,603.0* | *2,752.0* | *2,405.0* | *2,826.0* |
| *interbank/large-value* | *11,627.0* | *13,301.0* | *15,390.0* | *14,627.0* | *15,915.0* |
| Direct debits ..... | 187.0 | 200.0 | 223.0 | 246.0 | 226.0 |
| **Total** ..... | 16,637.0 | 16,182.0 | 18,449.0 | 17,358.0 | 19,051.0 |

Table 14

**Participation in S.W.I.F.T. by domestic institutions**

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Members | 26 | 27 | 29 | 30 | 29 |
| *of which: live* | *26* | *26* | *26* | *26* | *29* |
| Sub-members[1] | 21 | 22 | 23 | 23 | 25 |
| *of which: live* | *20* | *20* | *22* | *21* | *23* |
| Participants[2] | 1 | 1 | 1 | 1 | 1 |
| *of which: live* | *0* | *0* | *0* | *0* | *0* |
| Total users | 48 | 50 | 53 | 54 | 55 |
| *of which: live* | *46* | *46* | *48* | *47* | *52* |
| *Memorandum items:* | | | | | |
| Total S.W.I.F.T.: | | | | | |
| *members* | *1,581* | *1,697* | *1,812* | *1,963* | *2,074* |
| *sub-members* | *1,228* | *1,315* | *1,469* | *1,607* | *1,738* |
| *participants* | *27* | *37* | *63* | *78* | *91* |
| *users* | *2,836* | *3,049* | *3,344* | *3,648* | *3,903* |

[1] Domestic users sponsored by members abroad. [2] Participants are not shareholders in S.W.I.F.T. and their message traffic over the network is restricted.

*Source:* S.W.I.F.T.

Table 15

**S.W.I.F.T. message flows to/from domestic users**

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Total messages sent ..... | 10,243,652 | 11,204,861 | 12,168,453 | 12,944,496 | 13,547,572 |
| *of which:* | | | | | |
| *category I* ..... | *5,297,656* | *5,664,570* | *5,836,114* | *6,071,972* | *6,310,685* |
| *category II* ..... | *2,336,383* | *2,606,782* | *2,743,791* | *2,790,345* | *2,733,648* |
| *of which:* | | | | | |
| *sent/received to/from domestic users* ..... | *1,107,095* | *1,031,989* | *999,117* | *1,419,578* | *1,763,389* |
| Total messages received ..... | 9,420,520 | 10,199,217 | 11,331,221 | 12,158,421 | 12,865,625 |
| *of which:* | | | | | |
| *category I* ..... | . | . | . | . | *4,941,606* |
| *category II* ..... | . | . | . | . | *1,921,436* |
| *Memorandum item:* | | | | | |
| Global S.W.I.F.T. traffic .. | 255,142,610 | 298,780,982 | 332,895,932 | 365,159,291 | 405,540,962 |

*Source:* S.W.I.F.T.

**Methodology and sources used for the compilation of Tables 12 and 13**

In principle, all cashless transactions are included, duly corrected for double-counting. Though most figures are based on available statistics, estimates have sometimes had to be made.

# PAYMENT SYSTEMS IN SWEDEN

# Table of contents

# 1. INSTITUTIONAL ASPECTS

## 1.1 General legal aspects

In Sweden there is no law that deals solely and explicitly with payments and payment systems. Instead, different aspects of these activities and their institutional framework are dealt with in different laws. The more important of these are described below.

Sveriges Riksbank, the Swedish Central Bank, shall promote, according to a provision in the Constitution Act, "a safe and efficient payment system". The main instrument by which the activities of Sveriges Riksbank are governed is the Sveriges Riksbank Act *(Riksbankslagen, 1988:1385),* which is an Act of Parliament. The first provision of the Act states that the Riksbank may only engage in those activities which it has been authorised to carry out under Swedish law; that is, authorisation may be granted by laws other than the Sveriges Riksbank Act.

The law regulating banks and banking activities, the Banking Business Act *(Bankrörelselagen, 1987:617)*, does not contain any specific or explicit regulations concerning payments. It does, however, state that banks are allowed to engage in activities that are compatible with deposit-taking. Providing payment services is obviously such an activity. The handling of cheque payments is regulated in a special law on cheque payments *(Checklagen 1932:131).* Also worth mentioning is the law dealing with consumer credit *(Konsumentkreditlagen, 1992:830),* which, among other things, regulates questions relating to responsibilities in the event of loss of debit or credit cards. The law dealing with debt securities *(Lagen om skuldebrev, 1936:81)* contains general regulations concerning payments in this area. The Share Accounts Act *(Aktiekontolagen 1989:827),* which regulates the handling of dematerialised securities, should also be mentioned here.

There are also a number of laws concerning various aspects of payments under extreme circumstances, for example in time of war.

A government commission has recently published a number of proposals with a view to creating a modernised and more complete legal framework for clearing and settlement on the securities market. One important ambition here is to provide a firm legal basis for netting.

## 1.2 Financial intermediaries

### *1.2.1 Banks*

The Swedish banking sector has long consisted of three groups of banks: commercial banks, savings banks and cooperative banks. The Banking Business Act contains provisions that apply to banks in the form of limited companies as well as to traditional savings banks and cooperative banks, while for each category there is a separate law regulating the establishment of a bank, its organisation, supply of capital, management and so on.

The heavy losses that have occurred in recent years in all parts of the banking industry have triggered a rapid process of structural adjustment. One aspect of this is that the configuration mentioned above is becoming less relevant. Most of the larger savings banks have recently merged, creating a new bank which accounts for around 80% of the aggregate balance-sheet total of all savings banks. Even more important, however, is that the traditional form of the savings banks, the association, has been abolished; the new bank is in fact a commercial bank. The cooperative banks have undergone a similar process. In other words, banks in forms other than joint stock/limited companies (i.e. commercial banks) now play a very marginal role in the Swedish banking and payment system.

At the end of 1992 there were 108 banks in existence in Sweden, of which ninety were independent savings banks, most of them very small and locally oriented. The three largest traditional

commercial banks (Svenska Handelsbanken, Skandinaviska Enskilda Banken and Nordbanken) accounted for nearly 65% of the aggregate balance sheet of all banks.

Foreign banks are allowed to operate in Sweden through branches as well as subsidiaries. At the end of 1992 there were eight foreign banks represented on the Swedish market, one through a branch and the others through subsidiaries. Their aggregate balance sheet amounted to just over 2% of the total for all banks. This share has been more or less constant since the Swedish market was opened to foreign establishments in 1985.

In recent years there has been intense and sometimes indignant public debate about the banks' pricing policy, which is clearly aimed at introducing specific charges for various services in the place of float-financing. Pricing of services that have traditionally been free of charge has often provoked fierce opposition from consumers. Although this has made the banks move slowly, they have nevertheless taken concrete steps in that direction, introducing charges, for example, for low-value cheque payments.

### *1.2.2 The Postal Giro*

The bulk of non-cash payment transactions by companies and households are made through the two giro systems, the Postal Giro and the Bank Giro.

The Postal Giro constitutes a separate department within the Post Office organisation. However, like the banks, although for different reasons, the Post Office organisation and the Postal Giro system are also going through a period of radical structural adjustment.

Aside from its general status as (part of) a public sector entity, the Postal Giro has long had a monopoly in transferring government payments to households and companies. On the other hand, there are strict constraints on its ability to, for example, provide overdraft or other lending facilities to its customers. These conditions will change in the near future, and the Postal Giro will have to (and be able to) compete with other providers of payment services (e.g. the banks) on a more equal basis. This will require revision of the current legal framework governing the Postal Giro, i.e. turning the Postal Giro into a bank.

### *1.2.3 The Bank Giro*

The Bank Giro is managed by the Bank Giro Centre, a company owned by the banks. The Bank Giro is used to make payment transfers between bank accounts. Unlike in the Postal Giro system, there are no separate Bank Giro accounts; instead, ordinary bank accounts are given a Bank Giro number.

### *1.2.4 Finance companies*

The number of finance companies has fallen over the last few years; at the end of 1992 there were 133, compared with nearly 300 in 1988. Finance companies are joint stock companies that arrange financing for enterprises as well as for households, and also provide administrative services. Around one-third of the finance companies are owned by banks; many of the others are owned by industrial or commercial enterprises.

Finance companies play a rather marginal role in the Swedish payment system, where their main function is to act as issuers or administrators for various debit and credit cards. For example, a large number of the cards issued by retailers are administered by finance companies. In some cases, retailers have formed finance companies of their own to manage their cards.

### *1.2.5 Clearing houses*

In addition to running its giro system, the Bank Giro Centre also serves as a clearing house for certain interbank payments. This procedure, known as the Data Clearing, was originally created for clearing cheques but has since been expanded to include a number of other retail payments as well. The resulting, bilaterally netted, positions are reported back to the banks and settled over the books of the Riksbank.

In Sweden there are two clearing houses operating in the securities market, the VPC (Swedish Securities Register Centre, *Värdepapperscentralen AB),* and the OM (*OM Stockholm AB).* Until recently the VPC served as the central depository and clearing house mainly for equities, but also for a number of private bond issues traded on the Stockholm Stock Exchange. In 1993 it also began handling money market instruments in a separate but basically similar system. The OM is an exchange and a clearing house for the derivatives market which was established in the mid-1980s. Neither of these institutions provides payment services in the strict sense, but since their activities have important and close links with the payment system they should nevertheless be mentioned here. These systems are discussed further in Section 4.2.

The vast majority of credit and debit card transactions - except for those relating to retailer cards - are channelled through one of two companies, SERVO and BABS, the first of which is owned jointly by the commercial banks and the second by the savings banks.

## 1.3 The role of the central bank

Except for its explicit and exclusive mandate to issue notes and coin, the Riksbank's responsibilities in respect of the payment system and its various components are formulated only in general terms. For example, the Sveriges Riksbank Act states that the Bank shall promote a payment system that is "safe and efficient", and that it may grant credit to and receive deposits from banking institutions and participate in the clearing and settlement of payments between banks and certain other financial institutions.

In other words, according to the legal framework, the Riksbank's role as an overseer of the payment system has, so far, neither been elaborated in any explicit way, nor has it any formal obligation to provide, for example, clearing and settlement services. Nevertheless, the Riksbank does provide interbank clearing and settlement facilities for banks and a few other financial institutions, in the form of the Clearing and Interbank System (the RIX system). Banks' deposits with and loans from the Riksbank also pass through the RIX system, which is described further in Section 3.2.

At the time of the enactment of the current Riksbank Act in 1988, the intention of the legislature was to allow the Bank to act in a more flexible way than before. The Act imposes relatively few restrictions, stipulating only that, as mentioned above, all its activities must be authorised by law. New activities for which there is no authorisation would therefore presuppose amendment of the existing legislation by Parliament.

It may be noted that in recent years the Riksbank has adopted a more active role in questions concerning payment systems. For example, in 1992 the Riksbank invited representatives of the banks, the Postal Giro system, the Financial Supervisory Authority and the Swedish Bankers' Association to form an advisory group for payment system issues. So far, the group has served mainly as a forum for the exchange of information and discussion between the institutions and the Riksbank.

### 1.4 The role of other private and public sector bodies

In the public sector, apart from the Riksbank, there are a number of authorities involved in various aspects of the payment system.

The general supervision of banks, insurance companies and other financial institutions is the task of the Financial Supervisory Authority *(Finansinspektionen),* which is a government agency responsible to the Ministry of Finance. Although payments and payment systems are obviously a central part of banking activity, the supervision of the payment system and payment-related activities is not explicitly identified as a separate function of the Financial Supervisory Authority.

The National Board for Consumer Policies *(Konsumentverket)* is the government agency responsible for consumer protection in this and other areas. In practice, the Board's role in the payment system field is mainly concerned with the debit and credit card sector, where guidelines have been formulated and negotiated with the card-issuing companies.

The National Debt Office *(Riksgäldskontoret)* is an agency responsible to the Ministry of Finance with the task of financing the national debt. The National Debt Office participates in the RIX system and is the only non-bank institution with the right to borrow from and place deposits with the Riksbank. In the near future, the right to borrow will be abolished.

In the private sector, the Swedish Bankers' Association *(Svenska Bankföreningen)* has set up a standing committee to discuss and coordinate the banks' approach to issues concerning the technical and safety aspects of payments and methods of payment.

## 2. PAYMENT MEDIA USED BY NON-BANKS

### 2.1 Cash payments

Although firm empirical evidence is lacking, it is quite evident that cash payments still account for a very large share of total payment transactions in the Swedish economy. An estimate made some years ago indicated that cash payments accounted for about 95% of the total number of transactions, while, at the same time, their share of the total value amounted to only around 10%. Although it seems probable that the figures are somewhat lower today, cash still undoubtedly retains its dominant position as a payment medium in volume terms.

In recent years there have been major changes in the currency in circulation. New denominations have been introduced, while others have ceased to exist: the 10 öre coin and the 5, 10 and 10,000 kronor banknotes are no longer in circulation. The 50 kronor note will also soon be phased out. On the other hand, a 10 kronor coin has been introduced, as has a 20 kronor banknote.

The availability of cash has increased over the last decade, thanks to the growing number of cash dispensers/ATMs. It may also be noted that an individual can make cash withdrawals at any branch of any bank, irrespective of which bank he holds his account with. With one exception, the commercial banks also operate a common ATM network *(Bankomat).*

## 2.2 Non-cash payments

### *2.2.1 Giro systems*

The two giro systems, the Postal Giro and the Bank Giro, play a dominant role in the Swedish payment system, covering a wide range of transactions, for both households and companies; the vast majority of Swedish enterprises and organisations hold accounts with both systems. In 1992 these systems together accounted for nearly 80% of all non-cash transactions. In value terms, the corresponding figure was even higher, at almost 90%. Around 65%, in value terms, was generated electronically, while the remainder was paper-based. Although it would be technically possible to establish full interoperability between the systems, this has not been done.

The Postal Giro system is the larger of the two giro systems and handles all kinds of transactions, both low-value payments to and from households and large government payments. Concerning the latter, the Postal Giro has had a monopoly in providing payment services to governmental bodies. As mentioned earlier, this will be abolished in the near future. At the end of 1992 the total number of Postal Giro accounts was 1,806,000. The number of transactions that year was about 415 million.

Unlike the Bank Giro system, the Postal Giro is also extensively used by households, partly owing to the fact that Nordbanken, one of the largest commercial banks, uses the system for handling salary payments to government employees. In addition, the savings banks have a large number of salary accounts linked to the Postal Giro system. The fact that transactions can be handled by all Post Office branches throughout the country, and that these have longer business hours than the banks, has of course also contributed to the attractiveness of the system.

Since 1986 the Postal Giro has been a member of the S.W.I.F.T. network for international transactions. In recent years the Postal Giro has been integrated in a European network of postal giro systems, Euro-giro, for handling cross-border payments.

In 1992 the Bank Giro system comprised links to 911,000 bank accounts and handled around 210 million transactions.

A growing proportion of the transactions in both systems are initiated electronically; as might be expected, this tendency is more pronounced for large-value transactions, so that enterprises and organisations nowadays usually submit their payment orders by electronic media, while households still send their written payment orders by mail.

### *2.2.2 Direct debits*

Direct debits (in Sweden called auto giro) still account for a rather limited share - around 5% - of the total number of non-cash transactions, although their importance is clearly growing. Both the Postal Giro and the Bank Giro systems administer direct debits.

### *2.2.3 Cheques*

In recent years the number of cheque transactions has decreased substantially; between 1988 and 1992 the number of transactions fell from 159 million to 68 million, which corresponds to 20 and 8.5% of all non-cash transactions respectively. Although these figures are only estimates, it is nonetheless clear that the cheque's importance as a payment medium is diminishing.

There are a number of possible explanations for this development. One is the growing number of ATMs, which have made cash more easily available at any time of the day, thereby reducing the need for cheques as a payment instrument. A second reason is the growing importance of various EFTPOS systems, which, from a practical point of view, should make payment by card more attractive. A third factor is that the Swedish banks have a clear policy of reducing the number of

cheque payments, owing to the high handling costs. To this end, various charges have been levied to make cheque payments less attractive to the consumer; for example, most banks have imposed a special charge on cheques written for small amounts (i.e. less than S.kr. 300/US$ 40). Recently, one of the major banks introduced a rather high charge (S.kr. 15/US$ 2) on all cheques, which has lowered the use of cheques drawn on that bank drastically.

In Sweden, all cheques can be cashed at any bank branch (or post office), irrespective of which bank they are drawn on. For smaller amounts (less than S.kr. 2,000/US$ 250) the issuing bank provides a guarantee, that is, bears the credit risk. For larger amounts the receiving bank has to obtain confirmation that the amount is covered by telephoning the drawee bank. These rules also apply to cheques used to pay for retail goods and services. It should also be noted that in Sweden all cheques are truncated, that is, the physical document is retained by the bank where the cheque is cashed and the information is transmitted by electronic media to the drawee bank.

#### *2.2.4 Credit and debit cards*

The use of plastic cards as payment media has grown over time, although the increase has been gradual. From the available statistics - which, however, do not give a completely reliable picture of the situation - it is fairly evident that traditional credit cards have never played an important role in the Swedish payment system and, moreover, that their significance has diminished over the last few years.

Instead, debit cards have gained in importance, most notably debit cards linked to bank accounts, in Sweden called bank cards. These usually combine several functions: those of a debit card for paper-based as well as EFTPOS transactions, an ATM card for cash withdrawals and a credit card, to the extent that the bank account (usually a chequing account) to which the card is linked has an overdraft facility attached to it. In addition, these cards can be provided with a linkage to international card systems such as VISA or MasterCard, which also makes them useful for international travel. About 75% of these cards offer such a linkage.

Another development in this field that has been evident over the last few years is the growing importance of various retailer cards. Few precise statistics are available in this connection, but it is clear that the number of issuers as well as the volume and value of transactions using these cards have risen considerably. According to estimates for 1992, retailer cards accounted for roughly 10% of total estimated card transactions, both in terms of value and in terms of the number of transactions.

### 2.3 Recent developments

A rapid structural transformation is taking place in the area of retail payments, with increasing automation as the main driving force. One important indicator of this is the fast-growing number of EFTPOS terminals in shops and at other points of sale; the number of terminals administered by SERVO and BABS, which are two bank-owned companies, has risen from 520 in 1987 to over 14,000 in 1992. It may be noted, however, that these figures do not include terminals managed by petrol distributors or retailers themselves, so that the actual number of such terminals is underestimated, as perhaps is the growth rate.

The growing importance of retailer cards in recent years can be partly explained by the technical development mentioned; it has made payment by card cost-effective from the retailer's point of view and eliminates the risk of theft and robbery associated with the handling of large volumes of cash. It also opens up new channels for marketing vis-à-vis customers.

A question under discussion in Sweden is whether, and how, card-based payment systems established by, for example, retailers should be made subject to authorisation or supervision. Another question of debate is whether the demarcation line between banks and non-banks has become blurred by the fact that some retailers offer their cardholders the possibility of "prepaying" for their

purchases by opening interest-bearing deposit accounts linked to their cards. Although these are subject to some restrictions (e.g. the size of the amounts which may be deposited, types of cash withdrawals), they do provide favourable rates of interest compared with most bank accounts. As a consequence, these cards are now widely used by a large number of households. Both these questions are being studied by a government commission.

Another area in which there have been technical innovations which could, potentially, trigger structural change is that of the smart cards and prepaid card. More or less sophisticated forms of home banking by telephone or terminal are also being developed.

So far, the use of prepaid or smart cards has been limited, with the exception of prepaid cards for public telephones. However, the market interest for "smart-cards" is clearly growing, and various system designs are now being developed and evaluated by the banks and by other institutions. As regards home banking, most Swedish banks have established telephone-based systems which allow consumers to monitor and make transfers between their own accounts.

## 3. INTERBANK EXCHANGE AND SETTLEMENT CIRCUITS

### 3.1 General overview

The Clearing and Interbank System (the RIX system), operated by the Riksbank, is the hub of the Swedish payment system. All interbank transactions, retail transactions as well as large-value transfers, are settled over this system. The system basically operates on a real-time gross basis.

As already noted, a number of clearing houses function as "sub-systems" of the RIX system. One is the VPC for securities transactions, another is the Bank Giro Centre, which, apart from settling giro transactions through its account at the Riksbank, also manages the interbank Data Clearing (for cheque transactions, etc.). The results of the Data Clearing are reported back to the banks. The bilateral net positions are settled between the banks within the RIX system.

Card transactions are collected and cleared for the most part by two companies, SERVO and BABS, which are owned by the commercial banks and the savings banks respectively. As with cheque transactions, interbank settlement in respect of card transactions takes place via the RIX system.

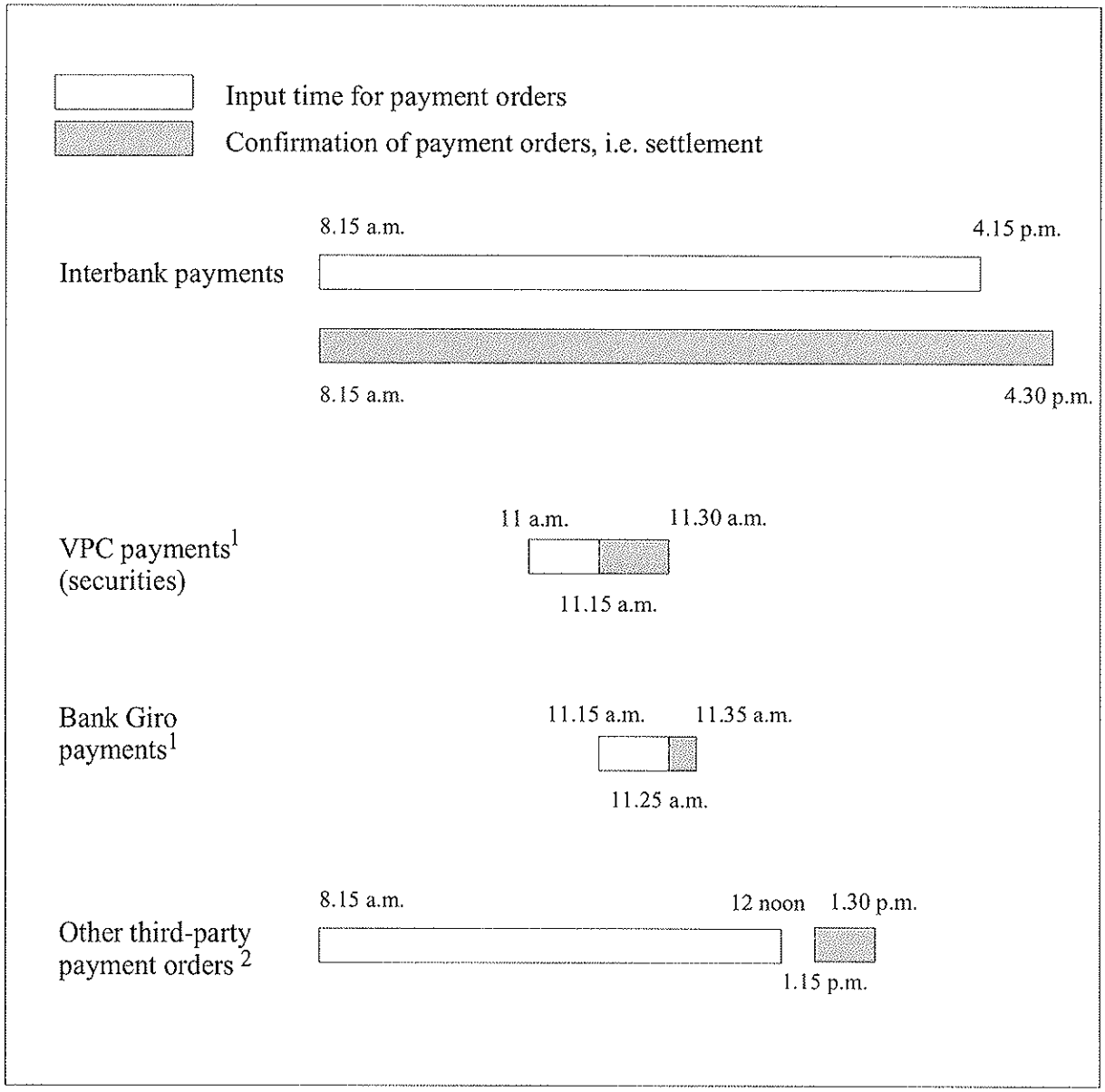
### 3.2 Structure, operation and administration of the RIX system

The Riksbank owns and administers the Clearing and Interbank System (the RIX system). Participants must be authorised by the Riksbank; they currently comprise fifteen banks (of which seven are foreign-owned), the Postal Giro, the Bank Giro, the Swedish Securities Register Centre (VPC) and the National Debt Office. The total number of participants in December 1992 was twenty, including the Riksbank. The participants have to pay a fixed annual fee to the Riksbank, amounting to S.kr. 160,000 (US$ 20,000). The system opens at 8.15 a.m. every banking day. Closing time for the input of transactions is 4.15 p.m. However, transactions which have already been reported can be confirmed, and thereby settled, until 4.30 p.m.

It may be noted that the remaining independent savings banks (see Section 1.2) do not participate in the RIX system. However, they have indirect access to the system via *Sparbanken Sverige*, which acts as their clearing bank.

Chart 1

**The RIX system: overview**




[1]Concerning the VPC and the BankGiro payments, 11:30 and 11:35 refers to the time when net payments to the VPC and the BankGiro are confirmed, which is the critical point in the process. Next step is the VPC and the BankGiro crediting counterparties. When these are confirmed, the VPC and BankGiro are back to zero position. [2] Includes Data-Clearing, SWIFT-Clearing, Arbitrage-Clearing and Document-Clearing.

Each participant has an account at the Riksbank. The banks and the National Debt Office are allowed to borrow from the Riksbank by overdrawing their accounts, both intraday and overnight, although the National Debt Office is to lose this possibility in the near future. Formerly there were no collateral requirements nor any upper limits on banks' borrowing, but in September 1992 collateral requirements were introduced for borrowing in excess of certain limits, which are set individually for each bank in relation to its capital base. This applies to intraday as well as overnight borrowing (see Section 3.3). The Riksbank's lending rate increases progressively for each bank with the total amount borrowed. There are twenty-two steps on the interest rate scale - each representing an interest rate increase/decrease of 0.25 percentage points - which applies to each bank's individual level of

borrowing in relation to its capital base. Normally, at the end of the banking day and as a result of interbank borrowing and lending, all banks are to be found on the same step of the scale.

All transactions in the system are based on participants debiting or crediting each other's accounts. Participants can monitor their positions on a real-time basis. Settlement is effected when the counterparty confirms the transaction. Transactions are treated on a gross basis, that is, there is no netting procedure integrated in the system. However, some transactions are subject to various forms of netting before being entered into the system, for example payments for securities transactions in the VPC.

The system basically processes two kinds of transaction, interbank transactions and third-party transactions.

Interbank transactions are settled on a real-time basis between 8.15 a.m. and 4.30 p.m.

Third-party transactions, or clearing transactions as they have traditionally been called, are reported from 8.15 a.m. until 12 noon each banking day and are settled as they are confirmed. This is normally done between 1.15 p.m. and 1.30 p.m. It should be noted that the banks are free to treat third-party orders as interbank transactions provided the customer and the banks involved agree to do so.

The third-party transactions between the banks can be divided into four categories, which are calculated separately but aggregated before being fed into the RIX system: the Data Clearing, mentioned earlier; the so-called S.W.I.F.T. Clearing, referring to amounts in Swedish kronor resulting from cross-border payments; the so-called Arbitrage Clearing for the Swedish leg of foreign exchange transactions between Swedish banks; and the Document Clearing, consisting of transactions which for different reasons are treated manually. These last transactions now account for only a very small fraction of RIX transactions.

### 3.3 Main projects and policies being implemented

In September 1992, after a number of trials in collaboration with the banks, the Riksbank implemented collateral requirements for intraday and overnight lending. For overnight credit, collateral is required for borrowing exceeding the last and highest step on the interest rate scale applied to such borrowing. For daylight credit, the banks have been allotted individual limits for uncollateralised overdrafts. These limits are based on historical experience of the banks' normal need for overdrafts during the day. They are calculated as follows: firstly, an amount roughly corresponding to the overnight borrowing (if any) of the banking system as a whole is distributed among the individual banks in relation to their capital base. To this figure an amount corresponding to 22% of the capital base is added. However, if a bank has a claim on the Riksbank, the amount of the claim is deducted from the total. This defines the limit for uncollateralised daylight credit. Borrowing above this limit requires collateral in the form of government or mortgage securities.

So far, the system has worked smoothly. Through more conscious management of their payment activities in the RIX system, banks have avoided any serious gridlock. One of the measures used for that purpose is bilateral netting, carried out on an ad hoc basis by the banks themselves. The possibility of integrating such a mechanism as an optional facility in the RIX system is under discussion. However, the Riksbank is aiming at a full collateralisation of both intraday and overnight credits. As a first step, and from 1st January 1994, the limited uncollateralised intraday credits are reduced from 22% to 16% of the banks' capital base.

The introduction of more transparent *access conditions* to the RIX is at present being discussed within the Riksbank for a number of reasons. Firstly, due to the financial problems in the Swedish banking sector in recent years, in combination with changes in the taxation laws concerning retirement savings in banks, there has been a growing interest in establishing new banks; several applications have been made to the government, asking for bank authorisation. Secondly, the EC Governors have recently stated the need for transparent and non-discriminatory access criteria in

interbank systems. As an applicant for EC membership, this is of course highly relevant to Sweden too. Another aspect is the possibility of so-called remote access, which is part of the EEA agreement, coming into force by 1st January 1994.

Another area of development concerns the handling of different kinds of third-party transactions. Traditionally, all such transactions have been reported by 12 noon at the latest and settled on an aggregated basis. In order to make the system more flexible and transparent, and to avoid any gridlock, it is intended to introduce different cut-off times for different categories of payments. The practical possibilities of settling (mostly large-value) third-party payments on a real-time basis have also been enhanced by introducing a new reporting routine. This will serve as an alternative to making urgent third-party transfer instructions over the telephone, which has been considered expensive and risky.

## 4. SPECIAL USE OF INTERBANK TRANSFER SYSTEMS FOR INTERNATIONAL AND DOMESTIC FINANCIAL TRANSACTIONS

### 4.1 Exchange and settlement systems for international transactions

Cross-border payments to and from Sweden are heavily dominated by remote corporate payments. According to estimates for 1990, these accounted for 98.5% of the total value transferred. The remaining 1.5% of payments made by individuals are predominantly face-to-face payments in the form of cash, travellers' cheques, credit cards, etc.; personal remote payments (bank cheques, transfers, etc.) account for less than 0.5% of the total value of cross-border payments.

In terms of value, the bulk of remote cross-border payments are bank remittances via correspondent banks, with payment instructions being communicated over the S.W.I.F.T. network. The other main method used is the commercial cheque. Although these account for around 25% of the total number of (remote) cross-border payments, their share in value terms is insignificant.

In Sweden the banks have decentralised the handling of S.W.I.F.T. payments. As a consequence of this, most of the larger bank branches have their own S.W.I.F.T. terminal. This has helped speed up the execution of cross-border payments. In addition, it has long been the practice for local branches to issue commercial cheques.

Normally, all payment orders from Sweden to foreign countries are transmitted on the day the customer initiates them. In principle, the customer pays on the day of the order. However, for so-called express payments, which account for the greater proportion of S.W.I.F.T. transactions in terms of value, most larger companies pay on the day that the amount is credited to the foreign bank, that is, normally one day after the transaction is initiated. Incoming payments are treated in basically the same manner. This means that competition between the banks has greatly reduced their income from float in respect of these types of cross-border payments.

It may be noted that in Sweden a code of conduct has been agreed upon by the banks with regard to the timing and treatment of cross-border payments, including transfers from a Swedish correspondent bank to another Swedish bank.

### 4.2 Exchange and settlement systems for securities transactions

In Sweden the securities market can be divided into three sectors - the equity market, the debt securities market and the derivatives market. Each has its own important role in the country's financial system.

### *4.2.1 The equity market*

Both institutional investors and individuals are participants in the equity market. Trades must be executed through one of the forty authorised banks or firms of stockbrokers. Unlike the debt securities market, the market for listed shares has no market-makers. Normally, trades are executed between banks and other stockbrokers on the Stockholm Stock Exchange. Banks can only act on behalf of their customers.

During the 1960s it had become increasingly apparent that a more rational and centralised service was needed for clearing and settlement trades on the Stockholm Stock Exchange. In 1971 this task was given to a company specially created for the purpose: the Swedish Securities Register Centre (VPC) *(Värdepapperscentralen AB)*. VPC is owned 50% by the state, 25% by forty registered stockbrokers and banks and 25% by the issuing companies.

During the 1980s the need for further rationalisation - a paperless system - became more and more acute owing to the rapid growth in trading on the equity market. At the end of 1989 a book-entry system, the VP system, was launched by the VPC for the clearing and settlement of equities, as well as some debt securities traded on the Stock Exchange. This new system - supported by a new Share Accounts Act - became fully operational in 1990.

During 1990 the certificates of all shares traded on the stock market, including convertibles and some bonds, were converted into book-entry form within the new system, so that all trading in equities in Sweden is now carried out in this form.

In designing and implementing the VP system one of the main aims was to provide a settlement mechanism that meets the requirements of delivery versus payment. This has been achieved by linking the transfer of securities in the VP system to the transfer of funds through the RIX system managed by the Riksbank. An issuer who is not listed on the stock exchange can choose whether or not he wants his securities registered at the VPC. No issuer using the VP system maintains his own register; in all cases this is done by the VPC, which is legally responsible for maintaining the registers correctly.

All registrations in the VP system are carried out at the request of the owners of securities by account-operating institutions *(Kontoförande Institut, KI)*, primarily banks and firms of stockbrokers authorised by the Financial Supervisory Authority. The holder of securities can choose either to have such an institution act as nominee for his securities, or to have his own VP account at the VPC. The vast majority of the participants have their own accounts. For foreign investors, registration can be handled by foreign trustees authorised by the Financial Supervisory Authority. Investors may split their holdings between several accounts and may also have these accounts managed by different account-keeping institutions.

The clearing and settlement process basically functions as follows.

When a sale transaction is put into the system, an immediate check is carried out against the VPC register. The input is rejected if the sale exceeds the number of shares that are registered in the seller's name.

A real-time comparison is made with the corresponding input of buy transactions. The input normally takes place not later than T + 1 (i.e. the working day following the trade). The information on matched (and unmatched) trades is then displayed immediately on each stockbroker's monitor. A check is also carried out to see whether the transaction will affect already booked but unmatched transactions.

The VP system gives each stockbroker real-time information about his input of trades. This information includes clearing and settlement data such as the matched and unmatched trades in all the securities concerned. The system calculates the net cash payment due from each stockbroker on each settlement day. Securities transactions themselves are not subject to netting.

At 10 a.m. on settlement day the stockbroker is required to place a bank guarantee with the VPC covering the amount due. If the broker is a bank this is not necessary. When all these net payments due from non-bank stockbrokers have been secured by bank guarantees, the matched trades are frozen. No additional input of data for that settlement day can be made. At this point, unmatched trades are cancelled. Settlement days are all business days of the week.

On settlement day all frozen transactions are settled. The RIX system is used for the transfer of funds. Each bank must, by 11 a.m., have sufficient funds - or a sufficient credit line - at the Riksbank. These funds should cover both the banks' own payment obligations - arising from acting as brokers - and those of all the stockbrokers whose payments they have guaranteed. The delivery of the securities takes place within the VP system immediately after the funds have been settled in the books of the Riksbank. Funds are fully available immediately after settlement.

No credit facility exists within the VP system or the VPC. However, banks can borrow intraday and overnight from the Riksbank (see above), thereby creating an indirect credit facility in the system.

Since September 1992 settlement has taken place on T+3 for all shares; previously it took place on T+5.

### *4.2.2 The debt securities market*

The Swedish debt securities market is largely an institutional market. Major issuers of debt securities are the state and a limited number of mortgage institutions; together they account for around 80% of the total value issued on the market. The remaining part consists of debt securities issued by, for example, industrial companies.

The latter type of bonds have been listed on the Stockholm Stock Exchange for many decades. In spite of that, the market has not - until recently - been especially well developed. In later years, however, a non-institutional bond market has emerged, and in 1991 the Stockholm Stock Exchange commissioned a computerised system for bond trading. Moreover, a broadening of the debt securities market has occurred, due to an increasing interest from households to make investment/savings in bonds.

Nevertheless, in all respects, the professional trading with government and mortgage securities that is taking place on the money market clearly dominates the Swedish debt securities market.

The money market differs from the equity market in a number of ways. One of the most important is that the number of participants is considerably smaller - around fifteen institutions, acting as market-makers, dominate the market; another is that the average daily turnover is much higher.

Clearing and settlement has, until recently, been performed on an essentially manual basis, with the exchange of physical documents for cheques. Of course, this has for various reasons been regarded as unsatisfactory, and over the last five to ten years several attempts have been made to create a modern book-entry system for debt securities. However, there have also been setbacks in this process, most notably the failure of the so-called PmC project in 1991. Since then, a number of proposals have been presented and discussed, and in May 1993 one of these, developed by the VPC, was approved by the Financial Supervisory Authority. Another competing system proposal; *Swedesettle*, is under evaluation by the Financial Supervisory Authority. The system is based on the concept developed by *Cedel* in Luxembourg, and will, if put into operation, be technically integrated with the Cedel system.

The VP system for money market instruments, whose implementation began in late spring 1993, is managed by the VPC. Its basic functions and characteristics are the same as those in the system for equities described above, viz. securities are dematerialised, it provides real-time monitoring, the VPC does not act as guarantor or central counterparty, funds (but not securities) are settled on a net basis over accounts at the Riksbank and DVP is achieved.

However, there are also a number of differences.

Firstly, in addition to the banks and stockbrokers which constitute the majority of those active in the equity system, a number of issuers and institutional investors - as well as the Riksbank - are established as account-operating institutions, that is, as direct participants in the system.

Secondly, both cut-off times and the length of the settlement cycle are different. In addition, a facility for securities repurchase agreements has been incorporated, together with a number of other functions.

Thirdly, the equity system is based on bank guarantees for payments due from non-bank participants. The money market system works without guarantees of this kind. This, in combination with the short time span between the cut-off time for providing funds and the settlement time, has made it necessary to devise special arrangements to handle a potential unwind situation that avoid unacceptable systemic risk. In particular, a special agreement has been reached under which all account-operating institutions in general, and the banks and issuers in particular, have a specific responsibility to act decisively and in concert to deal with an emergency situation of this kind. A central component of this arrangement is an obligation to enter into securities repurchase agreements or securities lending/borrowing operations. For the issuers, there is an obligation to issue new securities should this prove necessary to solve problems on the delivery side. These mechanisms have undergone full-scale trials on several occasions and will be tested on a regular basis.

The above-mentioned facilities do not presuppose any special intervention on the part of the Riksbank. The Riksbank has no specific responsibilities different from those of other account-operating institutions, except that, if necessary, it will set an interest rate level to provide a basis for determining prices in a market situation that may be very turbulent. In other words, the Riksbank has adopted a non-interventionist approach towards the system and its participants, in order to avoid the risk of moral hazard.

#### *4.2.3 The derivatives market*

A market for derivatives was established in Sweden in the mid-1980s. In Sweden there is one institution, the OM *(OM Stockholm AB),* that serves as both a market-place and a clearing house for derivatives.

As a clearing house, the OM operates on a net basis, both on the funds and on the securities side. Furthermore, and in contrast to the VPC in the equity and money market systems, the OM interposes itself as central counterparty, thereby guaranteeing settlement. Also unlike the VPC, the OM does not hold an account with the Riksbank and therefore does not use the RIX system for funds settlement. For the exchange of funds the OM holds accounts with a commercial bank on which net payments to and from participants are booked. Different accounts are used for different instruments. These net obligations are calculated by the OM and reported to the participants early each morning, normally through direct computerised links.

## 5. THE ROLE OF THE CENTRAL BANK IN INTERBANK SETTLEMENT SYSTEMS

### 5.1 General responsibilities

The Riksbank's responsibilities in respect of the payment system and its various components are formulated only in very general terms. For example, the Sveriges Riksbank Act states that the Bank shall promote a payment system that is "safe and efficient", and that it may grant credit

to and receive deposits from banking institutions and participate in the clearing and settlement of payments.

In other words, the Riksbank has no explicitly defined supervisory role in respect of the payment system, nor has it any formal obligation to provide, for example, clearing and settlement services for banks or other financial institutions. Nevertheless, the Riksbank does provide interbank clearing and settlement facilities for banks and a few other financial institutions, in the form of the Clearing and Interbank System (the RIX system). Banks' deposits with and loans from the Riksbank also pass through the RIX system.

### 5.2 Provision of settlement facilities

The Clearing and Interbank System (the RIX system) operated by the Riksbank is the hub of the Swedish payment system. All interbank transactions, retail transactions as well as large-value transfers, are settled over this system. The system basically operates on a real-time gross basis.

The Riksbank owns and administers the RIX system. Participants must be authorised by the Riksbank; they currently comprise fifteen banks (of which seven are foreign-owned), the Postal Giro, the Bank Giro, the Swedish Securities Register Centre (VPC) and the National Debt Office. The total number of participants in December 1992 was twenty, including the Riksbank.

Each participant has an account at the Riksbank. The banks and the National Debt Office are allowed to borrow from the Riksbank by overdrawing their accounts, both intraday and overnight, although the National Debt Office is to lose this possibility in the near future. Formerly there were no collateral requirements nor any upper limits on banks' borrowing, but in September 1992 collateral requirements were introduced for borrowing in excess of certain limits, which are set individually for each bank in relation to its capital base. This applies to intraday as well as overnight borrowing (see Section 3.3).

### 5.3 Monetary policy and payment systems

The RIX system is a vehicle for the implementation of monetary policy, through which the Riksbank monitors and regulates banks' lending and borrowing, primarily by means of its interest rate scale. The Riksbank's lending rate increases progressively with the total amount borrowed. There are twenty-two steps on the interest rate scale - each representing an interest rate increase/decrease of 0.25 percentage points - which applies to each bank's individual level of borrowing in relation to its capital base. Normally, at the end of the banking day and as a result of interbank borrowing and lending, all banks are to be found on the same step of the scale. Through money market operations, the banking system can be moved from one step to another, thereby influencing market interest rates.

### 5.4 Main projects and policies being implemented

In September 1992, after a number of trials in collaboration with the banks, the Riksbank implemented collateral requirements for intraday and overnight lending. For overnight credit, collateral is required for borrowing exceeding the last and highest step on the interest rate scale applied to such borrowing. For daylight credit, the banks have been allotted individual limits for uncollateralised overdrafts (see Section 3.3). Borrowing above these limits requires collateral in the form of government or mortgage securities.

So far, the system has worked smoothly. Through more conscious management of their payment activities in the RIX system, banks have avoided any serious gridlock. However, the Riksbank is aiming at a full collateralisation of both intraday and overnight credits. This will be implemented successively.

The introduction of more transparent access conditions to the RIX system is also being discussed within the Riksbank due to the growing interest for establishing new "narrow" banks, according to the principles recently stated by the EC Governors concerning transparent and non-discriminatory access criteria in interbank systems and the right for foreign banks without local representation to obtain a so-called remote access to national interbank systems, which is part of the EEA agreement coming into force by 1st January 1994.

Another area of development concerns the handling of different kinds of third-party transactions. Traditionally, all such transactions have been reported by 12 noon at the latest and settled on an aggregated basis. In order to make the system more flexible and transparent, and to avoid any gridlock, it is intended to introduce different cut-off times for different categories of payments. The practical possibilities of settling (mostly large-value) third-party payments on a real-time basis have also been enhanced.

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Table 1

**Basic statistical data**

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Population (millions): | | | | | |
| *average* ..... | *8.44* | *8.49* | *8.56* | *8.62* | *8.67* |
| GDP (SEK billions) ..... | 1,114.5 | 1,232.6 | 1,359.9 | 1,447.3 | 1,439.8 |
| GDP per capita ..... | 132,050 | 145,183 | 158,867 | 167,900 | 166,067 |
| Exchange rate (domestic currency vis-à-vis USD): | | | | | |
| *year-end* ..... | *6.1325* | *6.2270* | *5.6980* | *5.5500* | *7.0500* |
| *average* ..... | *6.1315* | *6.4481* | *5.9189* | *6.0587* | *5.8123* |

Table 2

**Settlement media used by non-banks**

(at year-end, not seasonally adjusted, in billions of Swedish kronor)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Notes and coin ..... | 54.9 | 60.5 | 61.7 | 64.8 | 64.3 |
| Transferable deposits ..... | 418.2 | 482.4 | 537.5 | 563.0 | 582.2 |
| *of which held by:* | | | | | |
| *households* ..... | | 325.0 | 353.7 | 384.8 | 374.2 |
| *corporate sector* ..... | 407.7[1] | 147.0 | 173.7 | 167.4 | 199.9 |
| *other*[2] ..... | 10.5 | 10.4 | 10.1 | 10.8 | 15.1 |
| Other[3] ..... | 23.2 | 28.7 | 36.9 | 34.0 | 29.3 |
| Narrow money supply ($M_1$) ..... | | | | | |
| *Memorandum item:* | | | | | |
| Broad money supply ... | 441.4 | 511.1 | 574.4 | 597.0 | 618.5 |

[1] Including households. [2] Local government. [3] Postal giro accounts and certificates of deposit.

Table 3

**Settlement media used by credit/deposit-taking institutions**

(in billions of Swedish kronor)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Reserve balances held at central bank[1] ..... | - 17.4 | - 27.9 | - 17.6 | - 22.3 | 4.1 |
| *of which:* | | | | | |
| *required reserves* ..... | *11.5* | *12.1* | *12.5* | *2.9* | *2.8* |
| Transferable deposits at other institutions ..... | 116.7 | 124.5 | 158.2 | 124.1 | 34.1 |
| Other[2] ..... | 1.8 | 1.3 | 2.2 | 0.8 | 1.5 |
| *Memorandum item:* | | | | | |
| Institutions' borrowing from central bank[3] ..... | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

[1] Including money market operations and borrowing under special facilities. [2] Deposits on postal giro accounts. [3] In the Riksbank Act there is a provision which allows the Riksbank to lend to banks and other financial institutions for other reasons than monetary policy, i.e. for liquidity purposes. This happened for the first time in September 1992. The figures refer to the situation at the end of the year.

Table 4

**Banknotes and coin**

(in millions of Swedish kronor)

| | **1988** | **1989** | **1990** | **1991** | **1992** |
|---|---|---|---|---|---|
| Total banknotes and coin outstanding ..... | 61,514 | 68,308 | 71,979 | 76,098 | 73,945 |
| Denomination of banknotes: | | | | | |
| *10,000 kronor* ..... | *2,223* | *1,194* | *665* | *170* | *19* |
| *1,000 kronor* ..... | *32,531* | *37,704* | *38,594* | *41,091* | *39,299* |
| *500 kronor* ..... | *7,398* | *9,199* | *12,182* | *14,733* | *15,711* |
| *100 kronor* ..... | *14,846* | *15,419* | *15,497* | *14,669* | *13,354* |
| *50 kronor* ..... | *921* | *961* | *1,010* | *1,035* | *817* |
| *20 kronor* ..... | - | - | - | - | *1,011* |
| *10 kronor* ..... | *1,431* | *1,502* | *1,573* | *1,313* | *433* |
| *5 kronor* ..... | *101* | *100* | *99* | *97* | *96* |
| Banknotes held by credit institutions ..... | 6,584 | 7,889 | 10,266 | 11,543 | 10,599 |
| Total banknotes outside credit institutions ..... | 52,867 | 58,190 | 59,354 | 61,565 | 60,141 |

Table 5

**Institutional framework**

(at end-1992)

| Categories | Number of institutions | Number of branches | Number of accounts (millions) | Value of accounts (SEK billions) |
|---|---|---|---|---|
| Central bank ..... | 1 | 21 | - | - |
| Commercial banks[1] ..... | 17 | 1,882 | 15.76 | 417.0 |
| Savings banks[2] ..... | 91 | 1,028 | 10.85 | 172.2 |
| Cooperative and rural banks[1] .. | - | - | - | - |
| Post Office ..... | 1 | 1,773 | 1.81 | 22.0 |
| *Memorandum item:* | | | | |
| Branches of foreign banks . | 1 | 1 | 0.00 | 0.6 |

[1] In 1991 the 12 cooperative regional banks merged into one unit. In 1992 this unit was transformed into a banking company and included in the commercial bank sector. [2] In late 1992 the sector's former commercial bank, Sparbankernas Bank, together with eleven large savings banks, formed a new bank, Sparbanken Sverige AB, which at the end of the year accounted for about 80% of the sector's total balance sheet.

Table 6

**Cash dispensers, ATMs and EFTPOS terminals**

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Cash dispensers and ATMs: | | | | | |
| *Number of networks* ..... | *2* | *2* | *2* | *2* | *2* |
| *Number of machines* ..... | *1,741* | *1,928* | *2,102* | *2,221* | *2,203* |
| *Volume of transactions (millions)* ..... | *152* | *174* | *170* | *208* | *218* |
| *Value of transactions (SEK billions)* ..... | *88* | *103* | *107* | *152* | *163* |
| EFTPOS: | | | | | |
| *Number of networks*[1] ..... | *2* | *2* | *2* | *2* | *2* |
| *Number of terminals* ..... | *702* | *3,420* | *6,090* | *8,916* | *14,276* |
| *Volume of transactions (millions)* ..... | *2* | *5* | *14* | *30* | *41* |
| *Value of transactions (SEK billions)* ..... | *2* | *4* | *8* | *17* | *24* |

[1] Terminals administrated by BABS and SERVO, two bank-owned companies which collect and redeem transactions for card issuers.

Table 7

**Number of payment cards in circulation**[1]

(in thousands)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Cards with a cash function | | | | 1,713 | 1,970 |
| Cards with a debit/credit function | 3,608 | 3,245 | 3,110 | 3,769 | 3,863 |
| *of which:* | | | | | |
| *cards with a debit function* | *1,237* | *1,222* | *1,280* | *2,352* | *2,295* |
| *cards with a credit function* | *2,371* | *2,023* | *1,830* | *1,417* | *1,568* |
| Cards with a cheque guarantee function | | | | | |
| Retailer cards | 3,130 | 3,610 | 4,100 | 4,984 | 5,900 |

[1] A card with multiple functions may appear in several categories. It is, therefore, not meaningful to add the figures.

Table 8

**Payment instructions handled by selected payment systems: volume of transactions**

(in thousands)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Data Clearing (retail clearing)[1] | 146,928 | 148,990 | 145,852 | 151,434 | 141,436 |
| *of which:* | | | | | |
| *truncated cheques* | *111,224*[2] | *112,756* | *106,471* | *108,299* | *98,972* |
| *other* | *35,704*[2] | *36,234* | *39,381* | *43,135* | *42,464* |
| The RIX system | 50[3] | 50 | 98[4] | 91 | 79 |
| *of which:* | | | | | |
| *interbank (large-value) transactions* | *12*[2] | *12* | *27*[4] | *25* | *28* |
| *third-party transactions ("clearing transactions")* | *38*[2] | *38* | *71*[4] | *66* | *51* |

[1] The Data Clearing is managed by the Bank Giro Centre. Calculated bilateral net amounts are reported back to participants and settled via the Riksbank's RIX system. [2] Estimated distribution. [3] Estimated. [4] Up to 1989, clearing and settlement were made on a bilateral net basis. Since 1990 RIX has been operating on a gross basis.

Table 9

**Payment instructions handled by selected payment systems: value of transactions**

(in billions of Swedish kronor)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Data Clearing (retail clearing)[1] ..... | 11,332 | 13,161 | 17,138 | 20,167 | 17,920 |
| *of which:* | | | | | |
| *truncated cheques* ..... | *11,117*[2] | *12,908* | *16,799* | *18,741* | *17,546* |
| *other* ..... | *215*[2] | *253* | *339* | *426* | *374* |
| The RIX system ..... | 9,500[3] | 9,524 | 34,949[4] | 38,434 | 44,521 |
| *of which:* | | | | | |
| *interbank (large-value) transactions* ..... | *3,800*[2] | *3,810* | *13,979*[4] | *17,502* | *23,462* |
| *third-party transactions ("clearing transactions")* ..... | *5,700*[2] | *5,714* | *20,970*[4] | *20,932* | *21,059* |

[1] The Data Clearing is managed by the Bank Giro Centre. Calculated bilateral net amounts are reported back to participants and settled via the Riksbank's RIX system. [2] Estimated distribution. [3] Estimated. [4] Up to 1989, clearing and settlement were made on a bilateral net basis. Since 1990 RIX has been operating on a gross basis.

Table 10

**Transfer instructions handled by securities settlement systems: volume of transactions**

(in thousands)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| VPC:[1] | | | | | |
| *of which:* | | | | | |
| *government securities*[2] | . | . | . | . | . |
| *equities* ..... | *346* | *342* | *464* | *595* | *769* |

[1] Swedish Securities Register Centre. [2] Government and mortgage securities have been included in the VP book-entry system since mid-1993.

Table 11

**Transfer instructions handled by securities settlement systems: value of transactions**

(in billions of Swedish kronor)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| VPC:[1] | | | | | |
| *of which:* | | | | | |
| *government securities*[2] | . | . | . | . | . |
| *equities* ..... | *119* | *124* | *104* | *131* | *172* |

[1] Swedish Securities Register Centre. [2] Government and mortgage securities have been included in the VP book-entry system since mid-1993.

Table 12

**Indicators of use of various cashless payment instruments: volume of transactions**

(in millions)

| **Instruments** | **1988** | **1989** | **1990** | **1991** | **1992** |
|---|---|---|---|---|---|
| Cheques issued ..... | 159 | 170 | 120 | 77 | 71 |
| Payments by debit and credit cards ..... | 46 | 50 | 55 | 68 | 70 |
| Paper-based credit transfers ..... | 235 | 204 | 276 | 210 | 165 |
| *customer initiated* ..... | | | | | |
| *interbank/large-value* | | | | | |
| Paperless credit transfers | 350 | 378 | 326 | 388 | 456 |
| *customer initiated* ..... | | | | | |
| *interbank/large-value* | | | | | |
| Direct debits ..... | 24 | 27 | 30 | 34 | 37 |
| **Total** ..... | 814 | 829 | 807 | 777 | 799 |

Table 13

**Indicators of use of various cashless payment instruments: value of transactions**

(in billions of Swedish kronor)

| Instruments | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Cheques issued ..... | 640 | 680 | 698 | 757 | 675 |
| Payments by debit and credit cards ..... | 27 | 33 | 34 | 43 | 44 |
| Paper-based credit transfers ..... | 1,423 | 1,576 | 1,871 | 1,980 | 2,115 |
| *customer initiated* ..... | | | | | |
| *interbank/large-value* | | | | | |
| Paperless credit transfers | 2,643 | 2,926 | 3,474 | 3,674 | 3,538 |
| Direct debits ..... | 139 | 163 | 188 | 203 | 152 |
| **Total** ..... | 4,872 | 5,378 | 6,265 | 6,657 | 6,524 |

Table 14

**Participation in S.W.I.F.T. by domestic institutions**

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Members | 16 | 16 | 13 | 11 | 11 |
| *of which: live* | *15* | *15* | *13* | *10* | *10* |
| Sub-members[1] | 11 | 11 | 10 | 9 | 9 |
| *of which: live* | *10* | *11* | *10* | *9* | *9* |
| Participants[2] | 0 | 0 | 0 | 0 | 0 |
| *of which: live* | *0* | *0* | *0* | *0* | *0* |
| Total users | 27 | 27 | 23 | 20 | 20 |
| *of which: live* | *25* | *26* | *23* | *19* | *19* |
| *Memorandum items:* | | | | | |
| Total S.W.I.F.T.: | | | | | |
| *members* | *1,581* | *1,697* | *1,812* | *1,963* | *2,074* |
| *sub-members* | *1,228* | *1,315* | *1,469* | *1,607* | *1,738* |
| *participants* | *27* | *37* | *63* | *78* | *91* |
| *users* | *2,836* | *3,049* | *3,344* | *3,648* | *3,903* |

[1] Domestic users sponsored by members abroad. [2] Participants are not shareholders in S.W.I.F.T. and their message traffic over the network is restricted.

*Source:* S.W.I.F.T.

Table 15

**S.W.I.F.T. message flows to/from domestic users**[1]

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Total messages sent ..... | 5,438,259 | 6,091,052 | 6,248,239 | 6,701,761 | 7,088,941 |
| *of which:* | | | | | |
| *category I*[1] ..... | *2,033,171* | *2,324,604* | *2,458,434* | *2,653,863* | *2,810,225* |
| *category II*[2] ..... | *1,542,438* | *1,704,908* | *1,672,378* | *1,788,521* | *1,797,251* |
| *sent to domestic users* ..... | *847,033* | *967,900* | *980,546* | *1,055,822* | *994,931* |
| Total messages received ..... | 4,821,526 | 5,291,973 | 5,417,561 | 5,766,385 | 5,879,573 |
| *of which:* | | | | | |
| *category I*[1] ..... | . | . | . | . | *1,980,723* |
| *category II*[2] ..... | . | . | . | . | *1,482,130* |
| *Memorandum item:* | | | | | |
| Global S.W.I.F.T. traffic .. | 255,142,610 | 298,780,982 | 332,895,932 | 365,159,291 | 405,540,962 |

[1] Category I: customer (funds) transfers. [2] Category II: bank (funds) transfers.

*Source:* S.W.I.F.T.

**Methodology and sources used for the compilation of Tables 12 and 13**

The volume and value of cheque transactions of one of the largest commercial banks have been used to estimate issued cheques for the whole banking sector. In Sweden cheques are filed by the receiving bank. The total amount of cheques is calculated and settled within the RIX system.

Figures for volume and value of credit card transactions have been based on a special study made by the Swedish Bankers' Association.

For debit cards data have been collected from the two card administration companies SERVO and BABS. For the petrol companies, etc., estimated figures have been used.

Data on paper-based and paperless credit transfers have been collected from the Postal Giro's and the Bank Giro's annual reports.

# PAYMENT SYSTEMS IN SWITZERLAND

# Table of contents

# 1. INSTITUTIONAL ASPECTS

On 19th June 1980 Switzerland and the Principality of Liechtenstein signed the Currency Agreement whereby all Swiss regulations pertaining to credit and monetary policy within the meaning of the Swiss National Bank Law or to the protection of Swiss coin and banknotes also apply automatically in the Principality of Liechtenstein.

## 1.1 General legal aspects

Cashless credit transfers on behalf of customers are executed in Switzerland by the banks and the PTT. Rules governing banking operations are contained in the Federal Law on Banks and Savings Banks, those governing the activity of the PTT in the Postal Service Law.

Under Article 39 of the Federal Constitution the task of the Swiss National Bank (SNB), as the central bank, is "to regulate the country's money circulation, to facilitate payment transactions and to pursue a credit and monetary policy serving the interests of the country as a whole". This wording is repeated in Article 2(1) of the National Bank Law. Article 14 of the Law contains the legal basis for the operation of interbank payment systems by the central bank. It empowers the SNB to operate giro accounts and carry out giro and clearing transactions. In doing so, the SNB enters into contractual relationships with its counterparties which are governed primarily by private law.

In Switzerland there is no law specifically governing cashless payments; the general provisions of private law apply. Important parts of private law are codified in the Swiss Civil Code and the Swiss Code of Obligations (law of contract). These laws are worded in a concise, easy-to-understand manner. They make no attempt to cater in full for every possible eventuality and there is virtually no explicit coverage of the legal issues relating to cashless payments. The laws therefore have to be interpreted to make them applicable to such cases which are not referred to directly. Thus court judgements and legal opinion are also important sources of law, as expressly stated in Article 1 of the Civil Code.

Business relations between banks and their customers are governed by contract; the banks use contracts whose content essentially follows a standard model (general terms of business).

## 1.2 The role of financial intermediaries

### *1.2.1 Banks*

At the end of 1992 there were 569 banks and finance companies in Switzerland with a total of 4,169 branches subject to the Swiss Banking Law. These included two groupings - that of the "Raiffeisen" banks (rural credit cooperatives) and that of the loan associations - with a total of 1,169 affiliated institutions, and 227 foreign-controlled banks. Most of the banks are universal banks, which offer their customers a full range of banking services. However, a number of banks have specialised: private banks, for instance, are engaged almost exclusively in investment management, while other categories of banks (the regional and savings banks) are concerned predominantly with mortgage business.

In 1949 the four major banks founded their own giro organisation, the "Bank Clearing" organisation. Over the next few years the cantonal banks, the regional banks and most other institutions also joined this system. In 1981 responsibility for the administrative and technical operation of the system was assigned to Telekurs AG, a joint venture of the Swiss banks. All banks in Switzerland are free to participate in the bank clearing system and at the end of 1992 those doing so numbered 330, with 3,356 branches.

The regional banks have been operating their own giro system since 1981, since when they have been participating indirectly in the Bank Clearing via their clearing centre.

A five-digit sort code is used for precise identification of individual branches in the interbank payment system. In the Swiss Interbank Clearing (SIC) system (see Section 3.2) this number is supplemented by a check digit.

In addition to the usual payment services such as inpayment, outpayment and credit transfers, the banks also offer cheque guarantee cards, credit cards and debit cards.

#### *1.2.2 PTT*

As early as 1906, a year before the SNB was founded, the Postal Administration received authorisation to open accounts for any firm or private individual; transactions such as cashless transfers, inpayments and outpayments could be carried out across these post office accounts. The Postal Administration's network of post offices throughout Switzerland provided the necessary infrastructure.

The PTT today has a network of some 3,800 post offices. With over 1.4 million post office accounts and approximately 570.3 million transactions a year (273.7 million cash inpayments, 249.1 million credit transfers and 47.5 million outpayments) the PTT plays a major role in the field of bulk payments.

The banks also execute some of their customers' payment orders via the PTT's payment system. Payments between the bank and post office networks are handled via the SNB's post office accounts.

#### *1.2.3 Credit card companies*

Credit cards have taken off substantially in recent years. They are issued either by the banks, in which case they come under the Eurocard/MasterCard or VISA organisation, or directly by credit card companies such as American Express and Diners Club. Petrol companies, large retailers and other businesses also issue credit cards, but the use of these cards is restricted.

### 1.3 The role of the central bank

According to the National Bank Law the principal task of the SNB is "to regulate the country's money circulation, to facilitate payment transactions and to pursue a credit and monetary policy serving the interests of the country as a whole".

#### *1.3.1 Cash*

The exclusive right to issue banknotes was conferred on the SNB by the Federal Constitution. This includes periodically developing new series of banknotes as well as the production, distribution and withdrawal of banknotes; old and unusable banknotes are destroyed and replaced by new ones. Banknotes are manufactured by a separate company; issue and withdrawal is carried out by the SNB via its own offices (two head offices, eight branches) and twenty agencies run by cantonal banks.

Coin is struck by the Federal Mint in Berne. The distribution and withdrawal of coin throughout the country is carried out by the SNB.

#### *1.3.2 Giro accounts*

The SNB operates giro accounts for banks, public entities, foreign central and commercial banks and international organisations. Giro account balances, except those of the Federal Government, do not bear interest but there is no charge for administering the accounts. Services include inpayments and outpayments, transfers and cheque facilities.

Claims arising from various interbank clearing systems (data media exchange facility, cheque clearing, securities settlement, etc.) are also posted to the participants' giro accounts.

### 1.4 The role of other private and public sector bodies

#### *1.4.1 Telekurs AG*

Telekurs AG is a service organisation belonging to Swiss banks. It provides services in the fields of financial information and payment systems.

#### *1.4.2 SEGA*

Like Telekurs AG, SEGA (Schweizerische Effekten-Giro AG - Swiss Securities Clearing Company) is owned by Swiss banks. It undertakes the central custody of securities and the execution of securities transactions.

#### *1.4.3 SOFFEX*

SOFFEX (Swiss Options and Financial Futures Exchange AG) operates an electronic system for the trading and settlement of options and financial futures. Its shareholders are five banks, the Zurich Stock Exchange, the Basle Stock Exchange and the Geneva Stock Exchange (position at end-1992).

## 2. PAYMENT MEDIA USED BY NON-BANKS

### 2.1 Cash payments

In Switzerland cash continues to be the most widely used payment medium in the consumer sector.

In 1992 the currency in circulation in Switzerland averaged Sw.fr. 28.5 billion, comprising Sw.fr. 26.5 billion worth of notes and coin for a total of Sw.fr. 2 billion. Notes and coin are legal tender, although no one is obliged to accept more than one hundred coins in payment (Article 6 of the Federal Coinage Law).

Notes are issued in six denominations (Sw.fr. 10, 20, 50, 100, 500 and 1,000) and coins in eight denominations (Sw.fr. 0.01, 0.05, 0.10, 0.20, 0.50, 1, 2 and 5). It is planned to introduce a new series of notes as from 1995. The main innovations will relate to the security features; moreover, the 500 franc note is to be replaced by a 200 franc note.

Over the past ten years currency as a percentage of $M_1$ has declined from 36% (1983) to 33.3% (1992).

Cash withdrawals are made mainly over the counter at a bank or post office or at cash dispensers.

## 2.2 Non-cash payments

### *2.2.1 Sight deposits*

Firms and individuals use sight deposits at banks and the PTT to make cashless payments. In 1992 sight deposits averaged Sw.fr. 49.9 billion. The banks pay interest of approximately 0.25% on current accounts and of around 4% on salary and personal accounts; the PTT pays 2% interest on personal account balances of up to Sw.fr. 10,000 and 0.25% on business accounts. Other types of account such as savings and time deposit accounts are not used directly for making payments.

### *2.2.2 Methods of payment*

*(a) Credit transfers*

The overwhelming majority of cashless payments in Switzerland take the form of credit transfers. This applies to individuals and firms alike, and the situation has not changed much despite the promotion of direct debits in recent years. In 1992 a total of 110.0 million credit transfers were executed by the banks[1] and 249.1 million by the PTT.

Bank and PTT customers have the possibility of issuing standing orders for regular payments. These payments are executed automatically on a date specified by the customer. This method is typically used for payments such as rent and health insurance premiums.

Payment instructions from bank customers presented to the bank in paper-based form are recorded by the bank electronically. All credit transfers are processed electronically between banks. Payment instructions delivered to the PTT in paper-based form are at present largely processed manually. The aim of both banks and the PTT is to have the customer input payment instructions on media which can be processed electronically. To that end PC-based programs for inputting payment data are also made available to customers who do not have extensive EDP applications of their own. In addition, banks are promoting the use of electronic media by offering more attractive charges.

The PTT offers a service enabling non-account-holders to make credit transfers by simply handing in the amount to be transferred, together with a form, at the counter of a post office. The beneficiary may be the holder of either a post office or bank account.

Another method of paying bills offered by the PTT is the inpayment form with reference number facility. Under this facility the person to whom payment is due, as a participant in the system, provides the debtor with a bill together with a paying-in slip which can be processed by OCR. The necessary payment data are preprinted on the paying-in slip. The PTT processes the forms by OCR and delivers the data to the payee on a data medium.

The PTT also offers a facility whereby the beneficiary can be paid the due amount at home by the postman. This often used to be done with state pensions, although this service has become less important in recent years.

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1 This figure includes only interbank transfers; figures on intrabank transfers are not available. A survey of three major banks showed that intrabank transfers account for 20 to 30% of the total transaction volume.

*(b) Direct debits*

The direct debit procedure was introduced by the banks in 1977 and today is used for just over 11 million transactions a year. Although it has been consistently promoted by the banks, its share in the total volume of payments has remained modest.

The consent of the debtor (payer) authorising a specific creditor (payee) to initiate debits (debit authorisation) is required before payments can be debited directly to his account. The creditor is responsible for obtaining the authorisation of the debtor. The creditor draws up the payment instructions on a data medium and sends it to Telekurs AG for processing. There, the incoming data media are processed daily and the debtor's bank receives the list of payments to be made on data media or in paper-based form according to choice. In certain cases, for instance where there are insufficient covering funds in the account or in the absence of the debit authorisation, debits may be rejected by the debtor's bank; the creditor is then responsible for recovering the amount due from the debtor.

The direct debit procedure is used, for example, by credit card companies when they periodically bill cardholders and by insurance companies for the collection of premiums.

The PTT has been offering a similar service since the end of 1992 but the bank and PTT services are not yet compatible. In spring 1993 negotiations were still in progress.

*(c) Cheques*

Cheques have never been very important in Switzerland. The usage of cheques rose steadily in the 1970s and 1980s owing to the introduction of Swiss Cheques (backed by cheque cards) in 1969-70 and their replacement in 1978 by eurocheques. The number of cheques writen rose between 1980 and 1989 from 7.6 to 18.5 million. Since then the importance of cheques has declined owing to the spread of cash dispensers, EFTPOS terminals and fees charged by the banks. In 1992 a total of 13 million cheques were processed.

Most of the cheques used in Switzerland are eurocheques backed by a eurocheque card or standard cheques drawn on a bank. They are processed by the Cheque Centre, which is run by Telekurs AG and is subject to supervision by the SNB. Cashed cheques are submitted by the banks daily to Telekurs AG. In the cheque processing the credit items for presenting banks and debit items for drawee banks are recorded on data media or in lists. Cheques normally remain with Telekurs AG, where they are microfilmed.

On production of a eurocheque card, eurocheques are guaranteed up to a maximum of Sw.fr. 300. They are used by individuals for paying for goods and services or for obtaining cash and may be used abroad, particularly in Europe.

The PTT offers postal cheques, which are also backed by cheque cards. Like eurocheques, postal cheques are guaranteed up to a maximum of Sw.fr. 300; they may also be used in various other countries for cash withdrawals.

*(d) Card payments*

*(i) Credit cards*

In recent years the number of credit cards issued and the extent to which they are used have increased considerably. Credit cards are issued by the banks in association with Eurocard/MasterCard or VISA and by organisations such as American Express and Diners Club. "Co-branded" cards are also increasingly being issued in association with undertakings such as the PTT, the Federal Railways and Swissair. At the end of 1992 over 1.7 million cards were in circulation in Switzerland, which could be used at over 55,000 merchant outlets. Cardholders are normally charged

an annual subscription fee, while the merchant has to pay a commission to the credit card company on every transaction. A growing number of outlets are equipped with direct lines to the authorisation centre or electronic terminals which authorise a transaction automatically. The sales voucher is increasingly being replaced by an electronic terminal which not only authorises the transaction but also simultaneously records and transmits the transaction data to the credit card company.

The transaction amounts are periodically paid to the merchants by the credit card companies by means of cheque or bank credit. Cardholders are periodically sent a statement of transactions. The procedure for settling this bill varies from one organisation to another.

Credit cards may also be used to withdraw cash over the counter at a bank or at cash dispensers. Use of this service varies because the cardholder is normally charged commission on each withdrawal. Furthermore, Eurocard intends to debit withdrawals from cash dispensers to the cardholder's bank account immediately (as with a debit card).

*(ii) Debit cards*

Debit cards are issued by banks and the PTT for their customers. Withdrawals made with debit cards are debited to a cardholder's bank or post office account a day or two later.

The debit card issued by Swiss banks is the eurocheque card (ec-card), which has a magnetic stripe enabling it to be used in EFTPOS systems and for withdrawing money from cash dispensers. For transactions at electronic terminals a PIN (personal identification number) is used.

Since 1988 the PTT has been providing its customers with the white "Postcard" debit card, a multifunctional chip card with a microprocessor and a magnetic stripe, which can be used with a PIN code to withdraw money from cash dispensers. The Postcard may also be used in EFTPOS systems. In addition, the PTT is planning to adapt its telephone booths to accept payment by means of Postcards as well as coin.

At the end of 1992 just over 2 million eurocheque cards and 0.8 million Postcards were in circulation.

*(iii) Retailer cards*

Various petrol companies, large retailers and retailers' associations issue their own cards, but these are valid only at their particular outlets. Customers normally receive a monthly statement of their purchases. No subscription fee is charged.

*(iv) Cash dispensers*

There are two independent cash dispenser networks in Switzerland: the bank (Bancomat) network and the PTT (Postomat) network. In 1987 there were 1,239 cash dispensers in operation; by 1992, the number had increased to 2,669. Over the same period withdrawals increased from 21.4 million transactions totalling Sw.fr. 7.2 billion to over 51 million transactions totalling Sw.fr. 16.2 billion.

The Bancomat network is being converted from offline to online operation, a process which is due to be completed by mid-1994. Withdrawals from the Bancomat network may be made with eurocheque cards and Eurocard credit cards and also with bank cards from a bank's own cash dispensers. With eurocheque cards and Eurocards up to Sw.fr. 1,000 a day may be withdrawn. The cardholder's PIN code must always be entered in order to make a withdrawal. With the offline system the PIN code and the card are verified by the cash dispenser and transactions recorded on the card's magnetic stripe. With the online system verification of the PIN code and other details is normally carried out centrally by the network operator (Telekurs AG). With the online Bancomat it is also

possible for banks to verify their own cards at their own cash dispensers themselves and also process the transactions directly themselves.

Cash dispensers may also be equipped with additional facilities for, say, requesting a statement of one's account or entering payment instructions. These facilities are, however, available only with a bank's own card at a bank's own terminals.

*(v) EFTPOS systems*

There are also two independent EFTPOS networks, the bank network and the PTT network. However, the terminals installed may normally use both networks.

The banks' first EFTPOS system, ec-DIRECT(Tanken), was introduced in 1985 as an offline system at filling stations. Transactions may be carried out with eurocheque cards and Eurocards but a PIN code must be entered. A list of stopped cards is held at each terminal and periodically updated. Cards are verified at the terminal against the list of stopped cards using the data stored in the magnetic stripe, which are updated with each transaction. In 1987 the number of filling stations equipped with terminals totalled 551, at which over a million transactions were carried out; by 1992 no fewer than 2,573 filling stations were equipped with terminals and the number of transactions totalled 12.8 million.

In 1988 ec-DIRECT(EFTPOS) was introduced by Telekurs AG. This system operates online, i.e. the card data are verified centrally by the system operator. Again, the cardholder's PIN code must be entered. At the end of 1992 a total of 3,174 retail outlets were equipped with 4,481 terminals. In that year just under 4.5 million transactions were carried out totalling Sw.fr. 790 million.

The PTT's EFTPOS system covers 591 retail outlets and 2,350 filling stations with a total of 4,273 terminals, at which 2.2 million transactions totalling Sw.fr. 134 million were executed in 1992. Transactions can only be carried out with the Postcard.

### 2.3 Recent developments

The banks have been working together for some time on preparing for the UN EDIFACT standards to be used in the Swiss payment system. Recommendations and guidelines are being drawn up on how the international standard is to be applied. These cover message standards, security and standard contracts. There are plans to set up a pilot scheme starting in 1994 for payments between firms and banks in accordance with the UN EDIFACT standards.

EDIFACT marks a further step towards the objective of processing payments electronically on the widest basis possible, from the issuer of the payment instruction to the final beneficiary. The efforts to replace data media in the existing services (data media exchange facility, direct debit procedure) with telecommunication wherever possible also fall into this context.

## 3. INTERBANK EXCHANGE AND SETTLEMENT CIRCUITS

### 3.1 General overview

In Switzerland interbank cashless payments are executed via the following systems:

- SIC (Swiss Interbank Clearing);
- the Swiss National Bank giro system;
- the data media exchange and direct debit facilities; and

- the cheque clearing.

In addition to these interbank systems a giro system for payments among the regional banks is operated under the auspices of the Association of Regional Banks, with 151 member banks at the end of 1992. This system will not be dealt with any further here.

### *3.1.1 SIC*

The role of SIC is to execute interbank payments in Swiss francs finally and irrevocably twenty-four hours a day with funds held at the SNB. It is a real-time gross settlement system, i.e. all payments are settled individually on the participants' accounts (debiting of the account of the bank issuing the payment instruction and crediting of the account of the receiving bank). SIC's most important objectives are to reduce credit risks, accelerate the payment process, facilitate banks' cash management and eliminate giro account overdrafts at the SNB.

SIC was developed between 1981 and 1986 by Telekurs AG in collaboration with the Swiss banks and the SNB and came into operation on 10th June 1987. The start-up phase lasted from June 1987 to January 1989. During this period the systems using vouchers or data media were phased out, the banks were progressively linked up directly to SIC, and the transaction volume was gradually increased.

SIC is both a large-value payment system and a retail payment system; there are no value limits. In 1992 slightly more than 64 million payments were executed for a total value of approximately Sw.fr. 33 trillion, giving an average value of a little over Sw.fr. 500,000 per payment. For a more detailed description of SIC, see Section 3.2.

### *3.1.2 The Swiss National Bank giro system*

The SNB operates giro accounts for banks, public entities, foreign central and commercial banks and international organisations. At the end of 1992 there were 940 giro customers, 147 of which were foreign institutions. The SNB's giro system is used above all for the processing of payment instructions from banks which are not participants in SIC, or for cash inpayments to and withdrawals from the SNB; orders are voucher-based.

As well as individual transactions, the totals from the cheque clearing, data media exchange and direct debit clearing, Bancomat and EFTPOS clearing and securities clearing, and the balances from SOFFEX processing, are booked across the giro accounts.

### *3.1.3 The data media exchange facility and direct debit procedure*

These systems enable payment instructions from bank customers to be processed electronically. Payment instructions are submitted by bank customers on diskettes, cassettes or magnetic tapes or via file transfer to Telekurs AG. At the same time the issuer of the payment instruction sends his bank a payment order (data media exchange) or a collection order (direct debit). The bank can then authorise the data at Telekurs AG to be processed.

The deadline for accepting data media and transmitted data is 9 a.m. for payments to be settled across participating banks' giro accounts at the SNB on the next bank business day (data media exchange) or next bank business day plus one (direct debit). Subsequently the payment instructions are processed, with calculation of the total credits and debits for each bank and delivery of the payment records to each bank. Once processing is terminated at 4.30 p.m., the totals are transmitted to the SNB for posting to the giro accounts. At 6 p.m. the output is ready for the banks. In the case of data media exchange, booking on the giro accounts at the SNB takes place on the bank business day after processing, and in that of direct debits two bank business days after processing. The purpose of

the two-day period for direct debit processing is to enable debtors' banks to reverse direct debits submitted.

Over the past ten years the number of payments processed (data media exchange and direct debit) rose from 14.9 million (1983) to 56.7 million (1992), with direct debits accounting for 6.1% in 1983 and 19.4% in 1992.

### *3.1.4 Cheque clearing*

The central cheque clearing is for the processing of Swiss standard cheques and foreign eurocheques, which takes place at Telekurs AG under the supervision of the SNB. The bank at which the cheque has been cashed presents the cheque to Telekurs AG, which microfilms and retains it. After cheques have been processed, each bank receives the relevant details on data media and the totals for each bank (one credit and one debit total) are posted to the giro accounts at the SNB.

Swiss standard cheques must reach Telekurs AG by 10.30 a.m. on the day of processing, foreign eurocheques by 11 a.m. one day before processing. Once processing is terminated at 4 p.m., the totals are transmitted to the SNB for posting to the giro accounts and the output is made available to the banks. Posting to the giro accounts takes place the next day. The beneficiary's account is credited "subject to collection".

The period up to and including 1989 saw a rise in the number of cheques processed at Telekurs AG; since 1990 it has been falling. In 1983 13.2 million cheques for a total of Sw.fr. 44 billion were processed, in 1989 18.5 million (Sw.fr. 62.6 billion) and in 1992 only 13 million (Sw.fr. 46.9 billion). The average amount per cheque stood at Sw.fr. 3,342 in 1983, Sw.fr. 3,378 in 1989 and Sw.fr. 3,612 in 1992. The banks are seeking to discourage the use of cheques through their pricing.

## 3.2 Structure, operation and administration of major large-value systems

The only system available for the execution of payments between Swiss banks by electronic means is the SIC (Swiss Interbank Clearing) system. All payments between participating banks are executed via SIC, regardless of the amount involved and the underlying transaction. The particulars given in this section therefore refer exclusively to SIC.

### *3.2.1 Major legislation, regulations and policies*

As mentioned in Section 1.1, there are no special legal provisions governing payment systems in Switzerland.

SIC is run by the SNB, while Telekurs AG is under contract to provide the computer centre service. Private-law agreements between these two parties and with the participating banks form the legal framework for the operation and further development of SIC. The contracts are supplemented with regulations and handbooks.

Committees including representatives of the SNB and the participating banks promulgate changes and additions to the instructions and handbooks and take decisions on technical modifications to the application. All changes and additions require the approval of the SNB.

### *3.2.2 Participants in the system*

Participants in SIC must be located in Switzerland and be banks within the meaning of the Swiss Banking Law. In addition, they must keep a giro account at the SNB.

At the end of 1992, 162 participants were connected to SIC. This includes the regional banks' computer clearing centre, to which 151 banks were linked.

### *3.2.3 Types of transaction handled*

Only credit transfers in Swiss francs can be carried out via SIC, i.e. payments are always initiated by the paying bank. SIC can be used for payments by bank customers to a bank account, payment orders in favour of third parties, provision of cover and bank-to-bank payments. In addition, payments to a postal account or money orders (the amount concerned is delivered to the beneficiary at home by a postman) can be routed via SIC into the PTT payment system. Conversely, payments initiated at the PTT for the benefit of bank account holders are transferred from the PTT payment system to SIC.

There are no limits on the value of payments handled in SIC. Moreover, the underlying transaction, whether it originates from a bank's own business or is initiated by a customer, is irrelevant.

Large-value payments are accounted for mainly by Swiss-franc-related foreign exchange transactions, while small-value transactions stem predominantly from customer standing orders, individual customer orders, salary payments and so forth.

### *3.2.4 Operation of the transfer system*

The prerequisite for participation in SIC is an online connection to the central SIC computer. Payment instructions can be submitted value the same day (i.e. for settlement on day of presentation) or for settlement up to ten bank business days hence.

A payment is settled only if there are sufficient funds in the sending bank's SIC account; there is no provision for overdrafts. Settlement is final and irrevocable, and settled payments are delivered immediately to the receiving bank. SIC is thus a gross settlement system.[2]

If sufficient funds are not available, payments are held pending in a queue file. As soon as sufficient funds have accumulated through the settlement of incoming payments, payments are automatically cleared from the queue file. Pending payments are not delivered to the receiving bank and may be cancelled at any time by the sending bank (except that the cancellation of a payment order after cut-off time 1 must be agreed with the receiving bank). The receiving bank is notified of any cancellations since it has knowledge of incoming payments pending and a cancellation signifies a reduction in these pending items.

The payment transactions are processed on a "first-in, first-out" basis. All transactions have the same priority; it is not possible to change the sequence of queued payments. To a limited extent the sending bank can manage its queue of outgoing payments by cancelling and resubmitting instructions.

Participants can at any time request an up-to-date statement of their own account balance (total of settled outgoing and incoming items, total of outgoing and incoming items held pending in queue files, balances). Data can also be obtained concerning outgoing and incoming payments, whether these have been settled or not. The SNB, for its part, has access to all banks' data stored by the system.

SIC operates round the clock on bank business days. Settlement is carried out for approximately twenty-two hours. The day begins at 6 p.m. on the day before the bank business day in question with the transfer of giro balances from the master accounts at the SNB to the SIC accounts.

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2 The name given to the system can lead to misunderstandings as "clearing system" is often taken to be a synonym for "net payment system".

The day ends in three stages on the bank business day in question. 3 p.m. is cut-off time 1. From this moment on, payments submitted for same-day settlement are automatically changed to value the next bank business day. The only exception is the provision of cover, which can be submitted up to cut-off time 2 (4 p.m.) for same-day settlement. After cut-off time 2 only payments submitted by the SNB are accepted for same-day settlement. Day-end processing starts at 4.15 p.m. These are set times, but in exceptional situations (e.g. in the event of computer or transmission failures) they can be postponed by the SNB. At day-end, totals of debit and credit transactions are transferred from the SIC accounts to the master accounts at the SNB.

The purpose of the hour's difference between cut-off time 1 and cut-off time 2 is to give banks with queued payments, i.e. with insufficient funds, the time needed to acquire the necessary covering funds on the market or from the SNB. Covering funds from the SNB, so-called lombard loans, are available only against collateral and at a rate of interest which is at present 2% above the current money market rate. In the quarter-hour between cut-off time 2 and the start of day-end processing, only lombard loans can be accepted. During day-end processing, all the payments which are still queued, i.e. which it has not been possible to settle, are deleted; they must be resubmitted the next day.

Pending payments which are cancelled after cut-off time 1 without the consent of the receiving bank or which are deleted during day-end processing are subject to a penalty of 3% p.a. of the amount of the payment for the duration of the delay. The receiving bank is entitled to claim this penalty from the bank which issued the payment instruction. The latter is obliged to pay this penalty without delay, irrespective of any further claims by the receiving bank.

### *3.2.5 Transaction-processing environment*

Every bank is connected to the SIC system via the network run by Telekurs AG. This network is available not only for SIC but also for other services provided by Telekurs AG. The connection is set up via the bank's own mainframe or a front-end computer; terminal connections are not permitted.

All payment instructions must be authenticated using special equipment in order to prevent illicit insertion or alteration. However, encryption of transmissions is optional.

If a bank is unable to transmit payment instructions to the SIC computer centre, it must try to find an alternative solution, e.g. delivery on magnetic tape or transmission using another system. Payment messages which it has not been possible to transmit from the SIC computer centre to the beneficiary bank before day-end are issued on magnetic tape or, if necessary, on paper.

An active and a backup computer are available at the SIC computer centre for production processing. A third computer, which is normally used for development, is available at a second, remote computer centre.

The system's maximum processing capacity is at present approximately 1 million payments a day, with an average hourly throughput of 100,000. In 1992 over 253,000 payments were processed a day on average; on peak days more than 580,000 payments were settled.

In case of a catastrophic breakdown of SIC (as a result of software errors, destruction of the infrastructure, etc.), Mini-SIC is available. This is a straightforward data media clearing system, i.e. participants send payment instructions on magnetic tape to a newly designated processing centre, and after the single daily processing (calculation of the total credits and debits for each bank, sorting of payments according to recipient bank) they in turn receive payments on magnetic tape. Each bank's total is posted to the relevant giro account at the SNB.

### *3.2.6 Settlement procedures*

It is established in the contractual agreements between the SNB and the participating banks that settled payments are final and irrevocable. Payments are made available to the receiving bank immediately after settlement. The Bankers' Association recommends that customer accounts be credited value the same day.

Under the rules governing compensation in respect of payments with altered value dates and delayed payments, the receiving bank can claim interest at the call-money rate + 2%, or at least the lombard rate, for the whole duration of the delay. There are also provisions for dealing with misrouted payments.

Since the introduction of SIC in 1987, participants' practice has undergone the following main changes:

- balances on giro accounts have been reduced by two-thirds;[3]
- payment instructions are entered into the system earlier;
- smaller payments are entered before larger ones; and
- very large payments (over Sw.fr. 100 million) are sometimes split up into smaller transactions.

### *3.2.7 Pricing policies*

Prices are set per transaction and charged to SIC participants. It is left up to each bank to decide whether and to what extent to pass charges on to its customers.

Prices for next year are being set at a level at which the expected SIC operating costs (including costs in respect of the Telekurs network and all line charges) are covered by the expected volume of transactions. If there are substantial discrepancies, prices can also be adjusted in the course of the year.

The receiving bank pays a flat-rate fee of Sw.fr. 0.20 per transaction. The sending bank pays a fee based on the sum of two components, one of which depends on the time of initiation and the other on the time of settlement. In addition, the fee is partly dependent on the size of the payment.

The following table shows the prices valid for 1993.

| Time | Value | Initiation | Settlement |
|---|---|---|---|
| Before 8 a.m. | - | 0.06 | 0.11 |
| 8 a.m. - 11 a.m. | - | 0.08 | 0.16 |
| 11 a.m. - 2 p.m. | under Sw.fr. 100,000 | 0.10 | 0.20 |
| 11 a.m. - 2 p.m. | from Sw.fr. 100,000 | 0.30 | 0.90 |
| After 2 p.m. | under Sw.fr. 100,000 | 0.20 | 0.40 |
| After 2 p.m. | from Sw.fr. 100,000 | 1.00 | 2.00 |

(Example: For a payment amounting to less than Sw.fr. 100,000 presented before 8 a.m. and settled after 2 p.m., the sending bank pays Sw.fr. 0.46.)

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3 There has also been a change in liquidity requirements (effective since 1st January 1988).

The purpose of the pricing structure for the sending bank is to reward the early submission and settlement of payments. In particular, it is designed to ensure that small-value payments (bulk payments) are submitted and settled as early as possible. This also helps prevent bottlenecks in the queue file at day-end.

#### *3.2.8 Credit and liquidity risks and their management*

*(a) Credit risk*

Credit risks arise if a receiving bank acts upon information available about pending incoming payments.[4] In this case the receiving bank would de facto be extending credit to the sending bank (intraday or even overnight). However, the fact that the initiating bank can at any time cancel pending outgoing payments or payment orders for a later value date and that at day-end pending payment orders are automatically deleted by the system helps to limit such behaviour.

*(b) Liquidity risk*

Payments which are still held pending in a queue file at day-end are automatically deleted by the system. The receiving bank cannot therefore assume that queued payments will be settled in every case. However, the staggered close of clearing procedure, with cut-off times 1 and 2 and the time in between, give banks the opportunity to acquire the necessary liquidity on the interbank market or in the form of lombard loans from the SNB.

### 3.3 Main projects and policies being implemented

The experience with SIC has shown that the first-in, first-out principle restricts participants' room for manoeuvre in carrying out transactions for which the timing is crucial (e.g. cash withdrawals, fulfilment of claims from net payment systems). SIC is therefore being modified so that payment orders can be given priorities. Pending outgoing payments will then be worked through according to priority, and only within a priority category according to the first-in, first-out principle. This is to enable connected participants to manage their own outgoing payments more efficiently. The necessary system modifications should be completed in the second half of 1994.

SEGA is responsible for the central custody of securities and the execution of securities transactions. A new system for carrying out securities transactions was brought into operation in October 1993. It supersedes the batch-processing settlement system used hitherto. The objective of the new system called SECOM (SEga COMmunication) is to execute securities and funds transfer instructions on a trade-by-trade (gross) basis, with the securities being finally (unconditionally) transmitted from seller to buyer at the same time as the funds are transmitted from buyer to seller. In order to achieve this goal, SECOM is being directly connected to SIC (see Section 4.2).

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4 Information which the system gives to the receiving banks concerning pending payments is not legally binding and, as expressly laid down in the Regulations, is not to be regarded as a binding assurance that funds will be transferred.

# 4. SPECIAL USE OF INTERBANK TRANSFER SYSTEMS FOR INTERNATIONAL AND DOMESTIC FINANCIAL TRANSACTIONS

## 4.1 Exchange and settlement systems for international transactions

### *4.1.1 General overview*

In Switzerland there are no restrictions on international payments in force, although Article 16i of the National Bank Law contains a list of measures which can be ordered by the Federal Government if necessary for curbing inflows of funds from abroad. Similarly, there are no restrictions on the importing or exporting of Swiss francs or foreign banknotes and coin.

International payments are made mainly via banks but also via credit card companies, the PTT and, to a small extent, the SNB.

For the execution of international payments the banks have built up an extensive network of correspondent banks, supplemented by the presence of Swiss banks abroad and of foreign banks in Switzerland. At the end of 1992 a total of 227 foreign banks (foreign-controlled banks and branches of foreign banks) were operating in Switzerland; the Swiss banks for their part maintained 93 branches abroad.

Payment instructions between correspondent banks are initiated mainly via S.W.I.F.T. There is also a system for clearing eurocheques cashed in foreign currency by Swiss abroad and eurocheques drawn on foreign banks cashed within Switzerland. International transactions using debit and credit cards are cleared via the systems of the different card companies.

### *4.1.2 Retail payments*

Credit transfers are executed via correspondent bank relationships and are normally initiated via S.W.I.F.T. Banks with a foreign presence can also use their own networks for transmitting payment instructions.

Particularly for tourist purposes, the Swiss banks have their own travellers' cheque, the Swiss Bankers Travellers Cheque, which is issued in several major currencies and is valid indefinitely. It may be cashed at banks or used directly as a payment medium.

Eurocheques, together with the eurocheque card, may be used in most European and some non-European countries for withdrawing cash or directly as a payment medium. In 1992 over 1.6 million Swiss eurocheques were cashed abroad, while over 2 million foreign eurocheques were cashed in Switzerland. For a number of years it has also been possible to use the eurocheque card for withdrawing money from cash dispensers abroad; similarly, foreign holders of eurocheque cards can use the online cash dispensers in Switzerland.

With the steady growth in the number of credit cards and credit card transactions, their use outside Switzerland is also increasing. Transmission and settlement take place via the respective credit card companies' own networks.

### *4.1.3 Large-value transfers*

Large-value and small-value transfers alike are executed via S.W.I.F.T. or in the case of internationally active banks via their own networks.

The Swiss franc leg of a foreign exchange transaction is carried out exclusively via SIC. The proportion of foreign exchange transactions in SIC is shown by comparing the total value of debit and credit transactions on a normal day with that on a US public holiday, when the figure is around 10% of the normal daily turnover.

#### *4.1.4 Netting systems*

The recommendations made in the Report of the Committee on Interbank Netting Schemes of the Central Banks of the Group of Ten countries (Lamfalussy Report) are supported by Switzerland. Netting agreements are permitted only if proof is furnished that they are enforceable under all relevant jurisdictions in the event of a legal dispute, the closure of a bank or bankruptcy. The big Swiss banks intend to join the FXNET bilateral netting system as from the end of 1993. Currently legal opinions have been obtained and contracts signed with partners in the United Kingdom and the United States; these appear to provide a sufficiently sound legal basis.

### 4.2 Exchange and settlement systems for securities transactions

#### *4.2.1 Institutional framework*

SEGA (the Swiss Securities Clearing Company) is responsible for the central collective custody of securities that are freely negotiable in Switzerland. In addition, it makes available to participants the system for transferring the securities held and also handles the administration of the securities, for instance by attending to all the transactions connected with interest payments. Like Telekurs AG, SEGA is a joint venture of the Swiss banks. At the end of 1992 a total of 6,115 securities were eligible for SEGA; the value of the securities held in collective custody with SEGA amounted to Sw.fr. 464.1 billion.

The following are eligible to participate in SEGA:

- institutions subject to the Swiss Banking Law;
- INTERSETTLE (see below).

At the end of 1992 SEGA had 441 participating members.

All domestic and foreign securities listed in Switzerland or traded over the counter are eligible for SEGA, such as:

- bonds issued by domestic and foreign institutions;
- notes;
- money market book-entry claims;
- warrants;
- Swiss bearer and registered shares (whether officially or unofficially listed or traded over the counter);
- foreign shares listed in Switzerland.

To this end, all securities are provided with an identification number; they are referred to exclusively by this number when transactions take place.

Since 1988 the firm INTERSETTLE, which belongs to Swiss banks and brokers, has existed alongside SEGA. Although it is legally separate from SEGA, it uses the SEGA infrastructure, such as its computer centre and software applications. The purpose of INTERSETTLE is to provide participants with an international securities settlement system. To that end links are to be established with foreign securities clearing and depository organisations or custodian banks.

The following are eligible to participate in INTERSETTLE:

- domestic banks, brokers and finance companies acting on behalf of third parties;
- clearing organisations such as SEGA, Cedel, Euroclear and custodian banks;

- other categories of participants which satisfy the admission criteria.

The following securities are eligible for INTERSETTLE:

- all securities which are eligible for SEGA;
- a worldwide range of foreign shares and other securities which are traded locally or internationally (i.e. the securities handled by the foreign partner organisations).

INTERSETTLE holds domestic securities in custody with SEGA. Foreign securities are held in custody with national or international clearing organisations or with recognised banks.

SOFFEX (Swiss Options and Financial Futures Exchange AG) has been operating an electronic system for trading and settling options and financial futures since May 1988 and had forty-eight members at the end of 1992. Since that date a foreign-domiciled institution has also been a member, trading directly on SOFFEX from abroad. The holding of securities as collateral and the delivery of securities in connection with the transactions are undertaken by SEGA.

### *4.2.2 Structure, operation and administration of the systems*

*(a) SECOM*

On 4th October 1993 SEGA brought the new real-time SECOM (SEga COMmunication) system into operation. The system is being introduced in three phases:

- to begin with, all participants are gradually being connected online to SECOM. This phase will last approximately five months.
- subsequently, the functionalities for INTERSETTLE will be prepared and brought into operation; this phase will last approximately three months; and
- finally, the link between SECOM and SIC will be prepared and brought into operation. This phase will also last approximately three months.

The full range of functionalities will thus be ready in autumn 1994.

SECOM meets SEGA's and also INTERSETTLE's requirements for an international securities clearing system. It was developed for both companies with SEGA as project manager.

All participants in the SECOM system are linked to SECOM via an online interface. This can be set up either via a computer-to-computer connection or using SEGA's own low-cost PC-based MAX User Device (Maximal Access to Extended Settlement Services). SECOM operates twenty-four hours a day on bank working days.

Incoming instructions are processed individually in real time. The buy/sell instructions received from the buyer/seller of a security are prematched. On the execution date the seller's safe custody account is checked to ensure that there is sufficient cover. Failing this the transaction is put into a queue file and executed automatically as soon as completed purchases bring the total securities holding in the safe custody account up to the required level. If the total securities holding is sufficient, the sold securities are reserved in the seller's holding. The procedure on the financial side is then as follows:

- Transactions in Swiss francs:

For processing transactions in Swiss francs SECOM is connected online to SIC. Once the securities have been reserved, SECOM generates a payment instruction and sends this to SIC, which processes this payment instruction like any other, i.e. SECOM payments too are settled only if there is sufficient cover. After settlement the payment is delivered to SECOM, which can then release the reserved securities and finally debit/credit them to the seller's/buyer's accounts accordingly.

SECOM will not, however, be directly connected to SIC until the second half of 1994. Until then the payment amounts will be added together on the debit and credit side and, after SECOM processing, posted directly to the giro accounts with the SNB.

- Transactions in foreign currencies:

These are processed via INTERSETTLE. The participants must therefore maintain an account with INTERSETTLE. Once the securities have been reserved in the seller's safe custody account, SECOM checks that there is sufficient cover in the buyer's account. As with SIC, the payment is settled if there is sufficient cover, failing which it is put into a queue file and executed automatically as soon as the cover reaches the required level. Once settlement is completed, the securities reserved in the seller's safe custody account are released and posted accordingly.

Thus, once it is connected to SIC, SECOM will provide a real delivery versus payment procedure. The technical basis also exists to allow same-day execution of securities transactions, including the financial side.

Just under 90% of transactions are effected on a delivery versus payment (DVP) basis. In addition to DVP transactions, SECOM can handle new issues, forward and premium transactions, SOFFEX transactions, deliveries without payment and registered share transactions.

In 1992 over 3.8 million deliveries were executed. The volume of transactions executed against payment totalled Sw.fr. 385.8 billion.

*(b) SOFFEX*

The SOFFEX system enables the trading and clearing of options and financial futures to be carried out completely by electronic means. Clearing comprises the netting of all transactions, including premiums and charges, per participant. In addition, positions are evaluated and margins calculated.

Each participant's balance resulting from the SOFFEX processing is posted to his giro account with the SNB one day after processing. If one or more participants has insufficient cover by 9.30 a.m., the SNB transfers the necessary amounts by debiting SOFFEX's giro account. If SOFFEX's giro account also has insufficient cover after these transfers have been effected, SOFFEX sees to it that the necessary cover is provided by 12 noon.

In 1992 just over 15.1 million contracts (options and futures) were traded, corresponding to a daily average of 61,119 contracts. The volume of trades was 33% higher than in the previous year. The volume of option contracts traded, based on the value of the underlying securities, totalled more than Sw.fr. 128 billion.

## 5. THE ROLE OF THE CENTRAL BANK IN INTERBANK SETTLEMENT SYSTEMS

### 5.1 General responsibilities

The SNB's activities in the payments field are based on the Constitution and the National Bank Law. Both describe the SNB's principal task as being "to regulate the country's money circulation, to facilitate payment transactions and to pursue a credit and monetary policy serving the interests of the country as a whole". The activities required to promote or facilitate payment transactions are defined in greater detail in the National Bank Law (Article 14):

- accepting deposits on non-interest-bearing accounts; only the funds of the Confederation, of the Bank's staff, its welfare institutions as well as the income accruing from the management of securities for the account of third parties may be interest-bearing;
- carrying out giro, clearing and collection transactions;
- opening correspondent accounts with domestic and foreign banks; drawing cheques on Swiss and foreign correspondents.

In recent years considerable progress has been made in the technical architecture of cashless payment systems through the extensive application of electronic transmission and processing techniques. Compared with other enterprises the SNB has no comparative advantages in the provision of such services. The SNB can, however, decisively increase the efficiency and security of payment systems if payments are made in a final and irrevocable manner via giro accounts with the SNB. Particularly in the case of interbank payments, where large sums of money are moved, credit and liquidity risks are very important. The SNB has therefore concentrated on this segment of the cashless payments market.

## 5.2 Provision of settlement facilities

### *5.2.1 Use of central bank accounts for payment services*

In addition to Swiss National Bank giro transfers, the total debits and credits arising from the interbank services are also posted to the giro accounts at the SNB. An account may be opened upon application although the SNB is not obliged to accept funds or to give its reasons for rejecting an application to open a giro account.

Giro account balances do not attract interest and overdrafts are not permitted. A charge may be made for administering the accounts although at present this service is provided free of all charges.

Giro account holders are free to dispose of the funds in their accounts. At present there are no provisions governing minimum credit balances, for instance, within the framework of reserve requirements.

### *5.2.2 Role in gross settlement systems*

SIC is designed to operate as a real-time gross settlement system. SIC account balances are part of the giro balances. Thus the SNB is responsible for account management in the SIC system. Account management also covers the establishment or approval of rules and conditions governing admission to SIC and the execution of SIC processing.

### *5.2.3 Role in netting systems*

For these systems the SNB attends to the posting of the debit and credit totals for each bank to the giro accounts. Participation in these net settlement systems is subject to the lodging of collateral with the SNB, although the large banks and cantonal banks are exempted from this requirement. The collateral must consist of eligible securities, debt register claims or cash and serves inter alia to cover losses sustained by the SNB as a result of its function as clearing centre. It is not, however, used automatically to cover a negative giro account balance.

### *5.2.4 Role in the settlement of securities transactions*

To SECOM gross settlement services will be available through SIC.

For SOFFEX the SNB attends to the posting of the debit and credit totals to the giro accounts. SOFFEX processing may be cancelled if one or more participants is unable to cover negative balances resulting from the posting of the debit and credit totals, which are therefore booked at first only on a provisional basis; the posting of these amounts is final only once no accounts show a negative balance.

#### *5.2.5 Provision of credit facilities*

The SNB is prepared to open a lombard credit line for a bank against collateral. The rate charged for lombard loans is about 2% above the call-money rate.

### 5.3 Monetary policy and payment systems

The SNB's monetary policy is geared to holding price levels stable over the medium term (three to five years). To that end, the SNB limits growth in the money supply. At the end of 1990 the SNB published for the first time a medium-term money supply growth target of 1%, based on the assumption of 2% growth in Switzerland's productive potential. The difference is explained by the downward trend in the growth of the demand for banknotes: owing to the continuing trend towards cashless payments note circulation is growing significantly more slowly than GNP.

The SNB possesses various instruments for implementing its monetary policy. Dollar/Swiss franc swaps are the main instrument for controlling the money supply. These are concluded on market terms, with a maturity ranging from a few days to six months. Also used chiefly for monetary policy purposes are money market operations, which involve primarily open market operations on Federal money market book-entry claims. This instrument is employed principally for short-term liquidity control. In addition, lombard loans are granted, although these are used by the banks only as a last resort for easing short-term liquidity shortages. All these operations have the effect of increasing or reducing banks' giro account balances with the SNB.

According to the National Bank Law the SNB can also, for the purposes of controlling money supply, oblige the banks to hold minimum reserves. However, this instrument has not been deployed since 1977, as the same purpose can be served more simply and flexibly by the operations referred to above.

### 5.4 Main projects and policies being implemented

Over the next few years the most important new development will be the connection of SECOM to SIC, which will introduce a genuine delivery versus payment system for securities settlement (see Section 3.3). There are also plans to review the settlement procedures in the various bulk payment systems which operate on a net settlement basis and to adapt them to technical possibilities and the rapidly changing requirements.

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Table 1

**Basic statistical data**

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Population (thousands): | | | | | |
| *year-end* ..... | 6,620.0 | 6,720.0 | 6,751.0 | 6,834.0 | 6,905.0 |
| *average* ..... | 6,671.0 | 6,723.0 | 6,796.0 | 6,872.0 | 6,936.0 |
| GDP (CHF billions) ..... | 268.4 | 290.4 | 314.0 | 332.7 | 338.4 |
| GDP per capita ..... | 40,544.0 | 43,214.0 | 46,512.0 | 48,683.0 | 49,008.0 |
| Exchange rate (CHF vis-à-vis US dollar): | | | | | |
| *year-end (December average)* ..... | 1.4771 | 1.5679 | 1.2776 | 1.3877 | 1.4220 |
| *average* ..... | 1.4639 | 1.6357 | 1.3880 | 1.4353 | 1.4036 |

Table 2

**Settlement media used by non-banks**

(at year-end, not seasonally adjusted, in billions of Swiss francs)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Notes and coin ..... | 26.29 | 26.14 | 26.34 | 26.30 | 26.85 |
| Transferable deposits[1] ..... | 55.74 | 53.34 | 54.19 | 52.78 | 55.00 |
| Narrow money supply ($M_1$) ..... | 82.05 | 79.50 | 80.53 | 79.08 | 81.85 |
| *Memorandum item:* | | | | | |
| Broad money supply ($M_3$) ..... | 341.07 | 362.63 | 372.83 | 383.76 | 394.37 |

[1] Sight deposits in Swiss francs.

Table 3

**Settlement media used by credit/deposit-taking institutions**

(at year-end, in billions of Swiss francs)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Reserve balances held at central bank[1] ..... | 5.82 | 5.05 | 4.49 | 4.16 | 4.54 |
| Transferable deposits at other institutions ..... | 20.16 | 23.19 | 18.77 | 18.17 | 18.29 |
| Transferable deposits at PTT (Post Office) ..... | 1.38 | 1.88 | 1.51 | 1.39 | 1.78 |
| *Memorandum item:* | | | | | |
| Required reserves[2] ..... | 4.68 | 5.11 | 5.66 | 5.55 | 5.81 |
| Institutions' borrowing from central bank[3] ..... | 0.80 | 0.70 | 0.17 | 0.11 | 0.03 |

[1] Figures at year-end are peak values; average figures are as follows (in billions): 1988: 5.67, 1989: 3.49, 1990: 3.02, 1991: 2.83, 1992: 2.55. [2] Cash liquidity (cash and deposits with the Swiss National Bank and the PTT). [3] Lombard credits.

Table 4

**Banknotes and coin**

(at year-end, not seasonally adjusted, in millions of Swiss francs)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Total banknotes and coin issued ..... | 30,626.8 | 30,895.3 | 31,438.8 | 31,270.2 | 31,359.6 |
| Denomination of banknotes: | | | | | |
| *1,000 francs* ..... | *13,700.5* | *13,497.3* | *13,613.3* | *13,263.0* | *13,501.9* |
| *500 francs* ..... | *4,182.0* | *4,093.6* | *4,081.3* | *3,912.0* | *3,782.5* |
| *100 francs* ..... | *8,340.1* | *8,741.4* | *9,043.9* | *9,089.1* | *9,059.0* |
| *50 francs* ..... | *1,283.9* | *1,320.9* | *1,346.9* | *1,371.6* | *1,401.9* |
| *20 francs* ..... | *934.4* | *960.4* | *985.4* | *1,000.7* | *1,017.9* |
| *10 francs* ..... | *529.3* | *545.8* | *560.7* | *571.7* | *581.3* |
| Coin ..... | 1,656.6 | 1,735.9 | 1,807.3 | 2,062.1 | 2,015.1 |
| Banknotes held by credit institutions (incl. PTT) .... | 4,290.7 | 4,646.2 | 5,108.2 | 4,696.2 | 4,375.6 |
| Total banknotes and coin outside credit institutions . | 26,336.1 | 26,249.1 | 26,330.6 | 26,574.0 | 26,984.0 |

Table 5

**Institutional framework**

(at end-1992)

| Categories | Number of institutions | Number of branches | Number of accounts | Value of accounts (CHF billions) |
|---|---|---|---|---|
| Central bank ..... | 1 | 10[1] | 940 | 4.54 |
| Credit institutions ..... | 435 | 4,111 | - | 40.75 |
| PTT ..... | 1 | 3,801 | 1,407,345 | 15.60 |
| *Memorandum item:* | | | | |
| Foreign banks ..... | 14 | 26 | - | 0.1 |

[1] Including two head offices.

Table 6

**Cash dispensers, ATMs and EFTPOS terminals**

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Cash dispensers and ATMs: | | | | | |
| *Number of networks*[1] ..... | *2* | *2* | *2* | *2* | *2* |
| *Number of machines* ..... | *1,736* | *1,962* | *2,262* | *2,371* | *2,669* |
| *Volume of transactions*[2,3] . | *27.00* | *33.30* | *39.40* | *45.50* | *51.50* |
| *Value of transactions*[2,4] ... | *8.83* | *10.78* | *12.68* | *14.67* | *16.27* |
| EFTPOS: | | | | | |
| *Number of networks*[5] ..... | *2* | *2* | *2* | *2* | *2* |
| *Number of terminals* ..... | *1,398* | *2,165* | *2,590* | *5,183* | *11,327* |
| *Volume of transactions*[3] ... | *2.70* | *6.20* | *9.60* | *13.60* | *19.40* |
| *Value of transactions*[4] ..... | *0.10* | *0.26* | *0.47* | *0.80* | *1.41* |

[1] Bancomat and Postomat system. [2] Only transactions through a central processor. [3] In millions. [4] In billions of Swiss francs. [5] ec-DIRECT and Postomat-Plus.

Table 7

**Number of payment cards in circulation**

(at year-end, in thousands)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Cards with a debit/credit function | 2,731 | 3,231 | 3,709 | 4,147 | 4,547 |
| *of which:* | | | | | |
| *cards with a debit function* | *1,339* | *1,712* | *2,179* | *2,383* | *2,691* |
| *cards with a credit function* | *877* | *1,079* | *1,339* | *1,518* | *1,706* |
| *cards with a cash function*[1] | *1,846* | *2,157* | *2,728* | *3,184* | *3,783* |
| Cards with a cheque guarantee function | 1,841 | 2,152 | 2,356 | 2,629 | 2,840 |
| Retailer cards | - | - | - | - | - |

[1] Cash withdrawals at ATMs.

Table 8

**Payment instructions handled by selected interbank payment systems: volume of transactions**

(in millions)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| SIC (Swiss Interbank Clearing)[1] | 32.3 | 56.1 | 61.8 | 65.2 | 64.3 |
| Payments on data carrier or file transfer[2] | 45.2 | 35.6 | 39.5 | 46.0 | 56.7 |
| Bank giro | 1.1 | . | . | . | . |
| Cheques | 18.0 | 18.5 | 17.0 | 15.5 | 13.0 |

[1] SIC was introduced in June 1987 and replaced the bank giro system in June 1988 and the data media clearing system in January 1989. [2] Includes the data media exchange facility, the direct debit procedure and the data media clearing system.

Table 9

**Payment instructions handled by selected interbank payment systems: value of transactions**

(in billions of Swiss francs)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| SIC (Swiss Interbank Clearing)[1] | 25,238.0 | 30,020.0 | 30,355.0 | 30,431.0 | 33,369.0 |
| Payments on data carrier or file transfer[2] | - | - | - | - | - |
| Bank giro | - | . | . | . | . |
| Cheques | 58.6 | 62.6 | 61.1 | 55.3 | 46.9 |

[1] SIC was introduced in June 1987 and replaced the bank giro system in June 1988 and the data media clearing system in January 1989. [2] Includes the data media exchange facility, the direct debit procedure and the data media clearing system.

Table 10

**Transfer instructions handled by securities settlement systems: volume of transactions**

(in millions)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| SEGA:[1] | | | | | |
| Deliveries against payment | 3.51 | 4.43 | 3.81 | 3.29 | 3.38 |
| Deliveries free of payment | 0.51 | 0.52 | 0.47 | 0.46 | 0.44 |

[1] The Swiss Securities Clearing Company.

Table 11

**Transfer instructions handled by securities settlement systems: value of transactions**

(in billions of Swiss francs)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| SEGA[1] | 305.9 | 396.1 | 374.6 | 342.1 | 385.8 |

[1] The Swiss Securities Clearing Company.

Table 12

**Indicators of use of various cashless payment instruments: volume of transactions**

(in millions)

| Instruments | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Through banks:[1] | | | | | |
| Cheques issued[2] | 25.6 | 26.0 | 24.1 | 22.0 | 19.2 |
| Payments by debit and credit cards[3] | 15.5 | 19.7 | 25.7 | 38.7 | 49.4 |
| Paper-based credit transfers[4] | 1.1 | . | . | . | . |
| Paperless credit transfers[5] | 72.2 | 84.8 | 93.2 | 101.8 | 110.0 |
| Direct debits | 5.3 | 6.9 | 8.1 | 9.3 | 11.0 |
| **Total** | 120.2 | 137.4 | 151.1 | 171.8 | 189.5 |
| Through the PTT: | | | | | |
| Payments by debit cards[6] | . | . | 0.4 | 0.8 | 2.1 |
| Transfers (paper-based and paperless credit transfers, direct debits)[7] | 197.5 | 206.8 | 223.1 | 236.0 | 245.6 |
| **Total** | 197.5 | 206.8 | 223.5 | 236.8 | 247.7 |
| **Grand total** | 317.7 | 344.2 | 374.6 | 408.6 | 437.2 |

[1] Intrabank payments are not included. [2] Eurocheques, bank cheques and Swiss Bankers Travellers Cheques. [3] Eurocheque card, American Express, Eurocard, VISA and Diners Club. [4] Bank giro; was replaced in June 1988 by SIC. [5] SIC and banks' data media exchange system. [6] "Postcard". [7] Detailed figures were no longer published by the PTT after 1992.

Table 13

**Indicators of use of various cashless payment instruments: value of transactions**

(in billions of Swiss francs)

| Instruments | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Through banks:[1] | | | | | |
| Cheques issued[2] | 59.50 | 63.50 | 61.97 | 56.11 | 47.71 |
| Payments by debit and credit cards[3] | 3.20 | 3.91 | 4.64 | 6.79 | 8.43 |
| Paper-based credit transfers[4] | - | . | . | . | . |
| Paperless credit transfers[5] | 25,238.00 | 30,020.00 | 30,355.00 | 30,431.00 | 33,369.00 |
| Direct debits | - | - | - | - | - |
| **Total** | 25,300.70 | 30,087.41 | 30,421.61 | 30,493.90 | 33,425.14 |
| Through the PTT: | | | | | |
| Payments by debit cards[6] | . | . | 0.03 | 0.06 | 0.13 |
| Transfers (paper-based and paperless credit transfers, direct debits)[7] | 780.60 | 842.70 | 971.60 | 1,041.95 | 1,107.25 |
| **Total** | 780.60 | 842.70 | 971.63 | 1,042.01 | 1,107.38 |
| **Grand total** | 26,081.13 | 30,930.11 | 31,393.24 | 31,535.91 | 34,532.52 |

[1] Intrabank payments are not included. [2] Eurocheques, bank cheques and Swiss Bankers Travellers Cheques. [3] Eurocheque card, American Express, Eurocard, VISA and Diners Club. [4] Bank giro; was replaced in June 1988 by SIC. [5] Only SIC. [6] POSTCARD. [7] Detailed figures were no longer published by the PTT after 1992.

Table 14

**Participation in S.W.I.F.T. by domestic institutions**[1]

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Members | 96 | 102 | 107 | 109 | 117 |
| *of which: live* | *86* | *95* | *101* | *101* | *113* |
| Sub-members[2] | 41 | 48 | 52 | 53 | 57 |
| *of which: live* | *41* | *40* | *47* | *52* | *53* |
| Participants[3] | 2 | 4 | 4 | 5 | 5 |
| *of which: live* | *0* | *1* | *3* | *2* | *2* |
| Total users | 139 | 154 | 163 | 167 | 179 |
| *of which: live* | *127* | *136* | *151* | *155* | *168* |
| *Memorandum items:* | | | | | |
| Total S.W.I.F.T.: | | | | | |
| *members* | *1,581* | *1,697* | *1,812* | *1,963* | *2,074* |
| *sub-members* | *1,228* | *1,315* | *1,469* | *1,607* | *1,738* |
| *participants* | *27* | *37* | *63* | *78* | *91* |
| *users* | *2,836* | *3,049* | *3,344* | *3,648* | *3,903* |

[1] Data for Switzerland and Liechtenstein. [2] Domestic users sponsored by members abroad. [3] Participants are not shareholders in S.W.I.F.T. and their message traffic over the network is restricted.

*Source:* S.W.I.F.T.

Table 15

**S.W.I.F.T. message flows to/from domestic users**[1]

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Total messages sent ..... | 21,353,196 | 24,435,931 | 25,531,459 | 26,442,633 | 28,835,267 |
| *of which:* | | | | | |
| *category I*[2] ..... | *5,895,396* | *6,528,566* | *7,180,236* | *7,644,180* | *7,912,899* |
| *category II*[3] ..... | *8,260,125* | *7,016,273* | *7,401,454* | *7,946,117* | *8,424,164* |
| *sent to domestic users* ..... | *3,513,638* | *4,172,487* | *4,212,054* | *4,258,900* | *4,977,941* |
| Total messages received ..... | 17,291,944 | 20,352,052 | 22,558,989 | 23,796,984 | 25,805,430 |
| *of which:* | | | | | |
| *category I*[2] ..... | . | . | . | . | *5,364,953* |
| *category II*[3] ..... | . | . | . | . | *4,655,906* |
| *Memorandum item:* | | | | | |
| Global S.W.I.F.T. traffic .. | 255,142,610 | 298,780,982 | 332,895,932 | 365,159,291 | 405,540,962 |

[1] Data for Switzerland and Liechtenstein. [2] Category I: customer (funds) transfers. [3] Category II: bank (funds) transfers.

*Source:* S.W.I.F.T.

# PAYMENT SYSTEMS IN THE UNITED KINGDOM

# Table of contents

## INTRODUCTION

Payment systems in the United Kingdom have been undergoing considerable change in recent years. Competition amongst financial institutions in the United Kingdom in their provision of new and evolving payment services has been stimulated by both deregulation and advances in technology. At the same time, cooperation between these financial institutions, in the form of domestic and international initiatives, has further enhanced each institution's ability to improve its customer services and to address the extent of credit and liquidity risks to which it is exposed through its participation in payment systems.

The United Kingdom clearing systems described below have evolved over time and are not the subject of specific legislation or of specific regulatory provisions. The most widely used clearings are owned and controlled by their members under the umbrella organisation of the Association for Payment Clearing Services (APACS), an unincorporated association which was set up in 1985. (The detailed Sections of the report, in particular Section 1.4, describe the role of APACS, while the role of the Bank of England is covered in Section 5.)

## 1. INSTITUTIONAL ASPECTS

### 1.1 General legal aspects

There is no statutory supervision or regulation of the payment systems operating in the United Kingdom, though the Bank of England maintains a close involvement in them. (For a fuller description of this, see Section 5.)

Statute law relating to payment system services in the United Kingdom is limited, generally of considerable age, and deals largely with the technical usage of paper-based cheques and bills of exchange. Two statutes comprise almost the whole of this body of law; the Bills of Exchange Act, 1882, being a comprehensive codification of the then existing law on bills of exchange; and the Cheques Acts, 1957 and 1992, modifying the general principles of the 1882 Act as applied to paper cheques.

(For the statutory basis for bank and building society supervision, see Section 1.3.2.)

Competition law in the United Kingdom relevant to APACS is largely embodied in the Restrictive Trade Practices Acts, 1976 and 1977. The clearing systems under the APACS umbrella and the membership criteria of APACS fall within the scope of this legislation and require registration with and scrutiny by the Director General of Fair Trading. In addition to domestic competition law, there are a number of European Community laws and quasi-judicial constraints which may also be relevant to the provision of payment and settlement services in the United Kingdom, starting with Articles 85 and 86 of the Treaty of Rome itself. (See also Section 2.2.4 for the impact on credit card schemes of a report by the Monopolies and Mergers Commission in 1989.)

### 1.2 The role of financial intermediaries

#### *1.2.1 Banks*

There are currently approximately 500 institutions carrying on banking business in the United Kingdom, of which around 340 are branches or subsidiaries of foreign banks (of these 91 are branches or subsidiaries of banks established in other EC countries). The formation of APACS in 1985 (see Section 1.4) led to the reorganisation of the clearings, and allowed membership of the clearings to be open to any appropriately regulated financial institution meeting explicit and objective

criteria for entry. Sixteen commercial banks at present have membership of APACS ("the settlement members"). The Bank of England is also a member.

This open membership, together with increased competition from other financial institutions, has imposed a high level of competitive pressure upon banks' payment activities. Many banks, however, both foreign and domestic, prefer not to incur the costs of direct membership,[1] and participate in the clearings via agency arrangements with one of the members.

### *1.2.2 Building societies*

There are 87 building societies authorised by the Building Societies Commission.[2] The enactment of the Building Societies Act, 1986, gave societies some scope to expand their provision of financial services. The larger societies now offer a wide range of payment services, including money transmission, cheque guarantee cards, credit and debit cards. Four building societies are currently members of APACS. The remainder participate via agency arrangements. The 1986 Act also allows a society to change its mutual status by incorporation as a public limited company. Abbey National plc, for example, incorporated in July 1989 and was granted authorisation as a bank.

Other financial institutions which are not authorised under either the Banking Act or the Building Societies Act may only participate in the clearings as customers of a member.

### *1.2.3 Credit card companies*

Credit cards continue to be an important means of payment. Banks and building societies issue credit cards which are affiliated to either the VISA or MasterCard schemes. Until 1988 all MasterCards in the United Kingdom were branded as Access cards. There are now a number of other MasterCards in the United Kingdom which are known by the MasterCard brand.

### *1.2.4 Other institutions*

Certain other institutions are involved in payment systems. A number of retailers offer proprietary card-based credit facilities to their customers. American Express and Diners Club also issue travel and entertainment cards in the United Kingdom. The state-owned National Savings Bank operates through post offices, whilst the Post Office itself also provides payment services through its responsibilities for issuing and redeeming postal orders and handling the cash payment of various state benefits to the public. Girobank, formerly owned by the Post Office, is now an independently owned bank, but business is still transacted across Post Office counters and they are part of the Eurogiro payment system.

## 1.3 The role of the central bank

### *1.3.1 Banking*

The Bank of England's banking business is closely related to the work undertaken on behalf of government customers and the note issue. The Bank is not in the business of commercial risk lending and it has only five branches.

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1 New members have to pay the transitional costs incurred by the existing members as a result of them joining, purchase a share of the capital of the clearing company and fulfil the requirement of a minimum level of business.

2 Building societies are mutually owned credit institutions which were initially set up to provide mortgages for house purchase and savings accounts.

Government departments are not, on the whole, obliged to hold their accounts with the Bank. However, most of the major departments do so in order to facilitate the efficient operation of the central government accounts. The Bank acts as the paying agent through the APACS clearings for the large number of government payable orders[3] issued through the Paymaster General's Office, the Inland Revenue and the Customs and Excise.

The Bank provides a wide range of other banking services, including clearing facilities, to a number of public sector bodies, UK and international financial institutions (such as building societies and other central banks) and also to its own staff. It also holds the settlement accounts of all the full members of APACS.

### *1.3.2 Payment systems*

The Bank of England does not have any statutory powers in respect of payment systems, but it maintains a close involvement in them and acts as settlement institution for each of the APACS clearings. (For a fuller description of its role see Section 5.)

The only payment medium in respect of which the Bank has a statutory role is the banknote. Under the Bank Charter Act, 1844, the Bank possesses the sole right of note issue in England and Wales (see Section 2.1). This Act also has the effect of separating the note-issuing function of the Bank from its other activities, by dividing the Bank into two Departments for accounting purposes. The accounts of the Issue Department relate solely to the production, issue and payment of banknotes and to the portfolio of securities by which the note issue is backed. Profits from the note issue are payable to the Treasury. Under the terms of the 1844 Act, the Banking Department embraces all other banking activities undertaken by the Bank.

Responsibility for the supervision of banks authorised under the Banking Act, 1987 is vested in the Bank of England. However, banks incorporated and authorised in other EC Member States are entitled to carry on in the United Kingdom activities authorised by the Second Banking Coordination Directive and are not required to be authorised under the Banking Act. Such banks are supervised by their home state supervisory authority and the Bank of England retains only a limited role as a host supervisor. The Act also requires all institutions from non-EC countries to have authorisation in their home country before they may be authorised to carry on a deposit-taking business in the United Kingdom. Certain institutions have been exempted from the provisions of the Act; for example, institutions whose activities are regulated by other legislation, such as building societies supervised by the Building Societies Commission (under the Building Societies Act, 1986), are exempted.

## 1.4 The role of other private and public sector bodies

### *1.4.1 APACS*

APACS (the Association for Payment Clearing Services) is the body responsible for the provision and development of payment clearing mechanisms in the United Kingdom and for overseeing developments in payment systems generally. This means running the clearings for cheques and paper credit transfers as well as for electronic debits and credits together with the systems that handle high-value transfers in the United Kingdom.

APACS was established in 1985 following a review of the organisation, membership and control of the United Kingdom clearing systems by the Child Committee, set up in 1984 by the banks then participating in the Bankers' Clearing House. The results of the review were set out in the

3 These are instruments, very similar to cheques, which are used by government departments to make payments.

"Payment Clearing Systems" report published in December 1984 (the Child Report). The report's two main recommendations were a new structure for the organisation of payment clearing systems and new rules regarding membership of such systems.

Following this report, separate companies were set up beneath the APACS umbrella to run each of the clearings, with control and ownership of the organisation and these individual companies placed in the hands of the member institutions. By separating the clearings into three separate companies, it became possible for an institution to be a member of one without having to be a member of another. Membership of a clearing company carries with it membership of APACS and of its ruling body, the Council.

Membership of each company is open, upon payment of the appropriate entry fee, to all institutions that meet explicit and objective criteria. These criteria include being appropriately supervised, being able to meet the operational and technical requirements of membership, maintaining settlement account facilities at the Bank of England and accounting for a minimum volume of items passing through the given clearing.

The Cheque and Credit Clearing Company Ltd. is responsible for the bulk paper clearings of cheques and paper credit transfers in England and Wales (the paper clearings in Scotland and Northern Ireland are not included in the APACS structure). It has twelve members, eleven banks and one building society.

CHAPS and Town Clearing Company Ltd. is responsible for the high-value same-day settlement clearings. It has fourteen members, all of which are banks.

BACS Ltd. (known as Bankers' Automated Clearing Services Ltd. until 1986) is an automated clearing house, which provides an electronic bulk clearing for direct debits, standing orders and other automated credit transfers. It has nineteen members; fifteen banks and four building societies.

(For descriptions of these clearings see Section 3.)

Recent advances in technology have allowed banks and other financial institutions greater scope for provision of other payment system services within an increasingly competitive, if still essentially cooperative, environment. Two debit card schemes, VISA Delta and SWITCH, have been established outside the APACS umbrella. Various ATM network and cross-network settlement systems have also been established outside APACS, some involving non-bank financial institutions. Nonetheless, APACS remains the main body responsible for the organisation and control of the payment clearing systems in the United Kingdom. APACS also deals with cash matters, acts as a spokesman for the payments industry and represents the views of its members in discussions with the European Commission.

### *1.4.2 Bank and building society ombudsmen*

Ombudsmen for customers of both banks and building societies have been appointed in the United Kingdom. The Banking Ombudsman is able to deal with complaints arising since 1st January 1986, whilst the Building Society Ombudsman's remit extends back to July 1987. Membership of the Banking Ombudsman scheme is voluntary, whereas membership of the Building Society Ombudsman scheme is compulsory. Both ombudsmen deal with unresolved complaints from private customers concerning the provision of financial services, including money transmission services; in addition, commencing in January 1993, the Banking Ombudsman has begun to deal with complaints from small businesses. Complaints are resolved either by agreement or by the ombudsmen making recommendations or awards.

Whilst the Banking Ombudsman is able to impose binding awards of up to £100,000 upon those banks which are members of the Office of the Banking Ombudsman, the Building Society Ombudsman's awards are not binding, and building society members of the Office of the Building

Society Ombudsman have the option of publishing reasons for not complying with their ombudsman's awards.

### *1.4.3 Code of Banking Practice*

A Committee to Review Banking Services Law (the Jack Committee) was appointed in 1987 by the Treasury in association with the Bank of England. Its 1989 report on "Banking Services: Law and Practice" recommended, among other things, that banks and building societies in the United Kingdom should draw up a Code of Banking Practice, which would set out standards of good banking practice to be observed in dealings with personal customers in the United Kingdom. This Code includes certain payment system services, in particular electronic funds transfers. After lengthy discussions, the Code was brought into force in March 1992. All APACS members and the vast majority of banks and building societies providing a retail service have agreed to adopt the provisions of the Code. An independent Review Committee has been set up to monitor compliance with the Code and review it at least once every two years. It is intended to produce an updated version of the Code to come into effect in March 1994.

## 2. PAYMENT MEDIA USED BY NON-BANKS

### 2.1 Cash payments

The Bank of England has the sole right to issue banknotes in England and Wales, under the Bank Charter Act, 1844. The Bank currently prints and issues notes in four denominations - £5, £10, £20 and £50 - and these notes circulate freely throughout the United Kingdom. Three banks in Scotland and four banks in Northern Ireland retain the right to issue their own sterling notes, but, apart from a very small fiduciary issue, these must be fully covered by holdings of Bank of England notes, or of approved coin.[4] Banks in England and Wales draw the notes they require from the Bank of England for distribution through their own cash centres. Surplus notes can be removed from circulation either by returning them to the Bank or by holding them to the order of the Bank at specified cash centres prior to reissue.

The amount of cash drawn from ATMs continues to grow. In 1992 around £54 billion was drawn from ATMs in the United Kingdom. This represents some 1.1 billion drawings, as against almost 500 million drawings of cash by other means.

The Royal Mint (a government agency) is responsible for the production and issue of coin throughout the United Kingdom. Coins are currently in general issue in seven denominations: 1 penny, 2, 5, 10, 20 and 50 pence and £1. New smaller 5 pence and 10 pence coins were issued in June 1990 and September 1992, respectively. New copper-plated steel 1 pence and 2 pence coins, replacing the traditional bronze versions, were also introduced in September 1992. The Royal Mint delivers coin to bank cash centres or direct to their branches, against payment by the banks.

At end-1992 the value of notes and coin in circulation with the public totalled £17 billion.

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4 Bank of England notes may be regarded as legal tender in England and Wales and coins as legal tender throughout the United Kingdom. Notes issued by banks in Scotland and Northern Ireland are not legal tender.

## 2.2 Non-cash payments

### *2.2.1 Deposit money*

Recent changes in the UK deposit market have tended to increase the public's ease of access to funds on time deposit, both to withdraw cash and to make cashless payments. Banks now define retail deposits as deposits which arise from the customer's acceptance of an advertised rate of interest (including nil). Building societies include all shares or sums deposited by individuals, plus sums from contractual savings schemes, but exclude retail issues of subscribed capital, e.g. perpetual interest-bearing shares. These changes have been influential in determining how money supply is measured. The definition of narrow money changed, with effect from December 1992, from $M_2$ to the retail component of $M_4$.

### *2.2.2 Paper-based instruments*

Payments by cheque accounted for 45.5% by volume of all cashless payments in 1992, amounting to an average of 9.4 million items per day, excluding cheques drawn for cash and inter-branch cheques. Payment by cheque is generally acceptable at the point of sale only if the drawer presents a cheque guarantee card issued by the bank on which the cheque is drawn. At end-1992 almost 44 million cards with a cheque guarantee function had been issued in the United Kingdom by 55 institutions cooperating in the Cheque Guarantee Card Scheme. The standard maximum guarantee limit on these cards was £50 until 1989, when two higher limits of £100 and £250 were introduced; individual institutions are free to decide whether and how to offer these higher limits to their customers. To guarantee the encashment of cheques in continental Europe and some other countries, most banks also issue eurocheques and guarantee cards to their customers under the Uniform Eurocheque Scheme.

Many building societies now offer cheque book facilities to their customers, combining interest-bearing transaction accounts with additional features including direct debits, standing orders, automatic transfer facilities, ATM and EFTPOS access and automatic overdrafts.

Town cheques are used for some large-value same day transactions within the City of London (see 3.2.3).

The paper-based bank giro credit clearing accounted for 7% of cashless payments by volume in 1992. This system is used mainly for making consumer payments to large organisations, such as public utilities and mail-order companies, but it can also be used for payments to individuals, for example for the government to pay certain state benefits.

Cashless payments can be made through the Post Office; low-value payments can be made using postal orders, which are especially convenient for those who do not have a bank account. Use of postal orders has however declined sharply in recent years, and in 1992 only 39 million were issued, with a value of £299 million.

Volumes of paper-based (essentially cheque) transactions grew throughout the 1980s, but in the later years of the decade, by contrast with electronic and card-based transactions, at a diminishing rate. The peak was reached in 1990 and a decline in volumes began in 1991; this decline continued in 1992 and the first half of 1993. The decline reflects both the sharp growth in debit card transactions, and the impact of the recession.

### *2.2.3 Electronic instruments*

The vast majority of electronic direct debits, standing orders and other credit transfers are processed by BACS Ltd, though standing orders between accounts at a single bank are generally processed internally.

CHAPS, an irrevocable same-day interbank electronic payment system, may also be used by non-banks, via a participant bank, primarily for large-value, time-critical, payments (see 3.2.2).

Direct debits allow recipients of large numbers of payments, such as insurance companies and public utilities, to collect those payments automatically from bank or building society accounts after the account holder has signed a mandate authorising his bank to pay specified direct debits for either a regular fixed sum or a variable amount. In 1992 15.2% by volume of cashless payments were made by direct debit.

Standing orders and electronic credit transfers, which together accounted for 13.5% of all cashless payments by volume in 1992, are both initiated by the payer. Standing orders are used largely by individuals for the payment of regular fixed sums. Whereas in the past electronic credits tended to be used mainly for the disbursement of bulk payments such as salaries and wages, they are now increasingly being used for other transactions, such as corporations' purchase ledger payments.

All member banks and building societies participate in BACS by submitting data themselves and/or by sponsoring their customers for direct input to BACS. Some 35,000 customers are sponsored in this way. Users may submit payments directly to BACS or via third party commercial bureaux, but ultimate responsibility for all payments submitted to BACS lies with the sponsoring settlement banks which execute the payments.

### *2.2.4 Cards*

Card-based payments can be effected at many retail outlets in the United Kingdom by means of a credit, charge or debit card. There has been major growth in EFTPOS in the United Kingdom in recent years. There are now around 220,000 EFTPOS terminals in the United Kingdom, which accept, variously, credit cards, debit cards and travel and entertainment cards, and further growth is expected.

#### *(a) Credit cards*

Credit cards issued by banks and building societies have a credit facility with a pre-set limit ranging from £200 upwards. A customer's credit card account is separate from his/her bank account, which may well be with another bank, and card holders receive a statement of the outstanding balance on their credit card account on a monthly basis. Card holders may either pay off the full amount of the balance (it has been reported that around 60% of card holders in the United Kingdom operate their accounts in this way), or they may choose to pay a portion (minimum 5%) of the total amount outstanding. When the full balance is not settled each month, interest is usually charged on the outstanding balance from the date the transaction appears on the card holder's statement. From February 1990 a number of banks also started to charge their card-holding customers a flat rate annual fee.

Until 1988 individual banks issued either VISA or MasterCard credit cards. In that year the four largest clearing banks (Barclays, Lloyds, Midland and National Westminster) took up direct membership of both VISA and MasterCard, sometimes offering customers a choice of different terms for repayment.

Following a report in 1989 by the Monopolies and Mergers Commission on credit card schemes, retailers were permitted, from early 1991, to charge differential prices according to the customer's method of payment in order to enable them to recoup the merchant service charges levied by banks for processing credit card transactions. So far, however, there has been little evidence of differential pricing being employed.

By the end of 1992, there were 26.5 million credit cards in issue. In 1992 there were 715.4 million credit card transactions, valued at £31.3 billion, representing an average value per transaction of £44.

### *(b) Debit cards*

Separate debit card products were first introduced in 1987 and a number of UK banks and building societies now provide their customers with debit card facilities. UK debit cards enable card holders to make payments which are debited to their current accounts, in some cases on the same day or, more usually, two days after the transaction has taken place.

In the United Kingdom there are currently three competing debit card schemes. SWITCH, which is purely an electronic debit card, was launched in October 1988 and enables card holders to effect payments through EFTPOS terminals located principally in petrol stations, supermarkets and High Street chain stores. In 1992 there were around 60,000 outlets in the United Kingdom accepting SWITCH debit cards. SWITCH offers two types of membership. Full members issue cards and/or may also be acquirers of transactions from retailers. Card issuer associate members are only issuers of cards, and are typically smaller banks or building societies which process transactions and effect subsequent settlement through full members. VISA also run a debit card scheme, which since February 1991 has been branded Delta. VISA Delta debit cards can be used at most EFTPOS terminals in the United Kingdom, as well as in conjunction with paper vouchers. At December 1992 there were around 400,000 retail outlets in the United Kingdom accepting VISA Delta debit cards. MasterCard edc/Maestro cards were introduced into the United Kingdom in 1993.

At the end of 1992 there were a total of 22.6 million debit cards in the United Kingdom. Total UK debit card volume in 1992 was 522 million transactions, valued at £13.8 billion, representing an average value per transaction of £26. Although the number of debit card transactions is still below that of credit card and cheque transactions, it is growing at a very fast rate. It is estimated that volumes will rise to almost 2.5 billion transactions by the year 2000.

A number of retailers offer "cash-back" facilities operated through the electronic point-of-sale systems in their stores. These are facilities enabling debit card holders to obtain cash as well as goods in certain retail stores. Further store-based facilities are currently under consideration.

### *(c) Travel and entertainment cards*

There were 1.4 million travel and entertainment cards in issue to United Kingdom residents at end-1992; 1.1 million of these were issued by American Express and 0.3 million by Diners Club.

### *(d) Retailer cards*

Many retailers issue their own "in-store" cards. These usually only serve one store group and many operate on a "budget" basis, with a monthly subscription and a revolving credit facility of twenty or thirty times this amount. Other retailer cards operate in the same way as travel and entertainment cards or bank credit cards. At the end of 1992, there were 12 million in-store cards in issue.

### *(e) Prepaid cards*

The majority of prepaid cards that exist in the United Kingdom are single purpose cards, for example phonecards. The most significant development in the field will be the Greater Manchester Public Transport Executive's (GMPTE) prepaid card scheme, which is due to be launched in 1994. GMPTE hopes to issue up to one million cards in its first year, for use initially on the local public

transport network, although the scheme may be extended to other goods and services. These will be "smart" cards and represent the United Kingdom's largest issue of these products to date.

The use of *multi-purpose* prepaid cards, i.e. those that can be used to purchase goods and services from a range of non-connected suppliers, is limited, at present, to small-scale pilot schemes. However, two banks have announced plans to introduce such a card scheme, making use of smart card technology. Called "Mondex", the scheme will be piloted in 1995, and will be followed, if successful, by national and international launch.

#### *2.2.5 Automated teller machines (ATMs)*

At the end of 1992 a total of nearly 18,300 ATMs were in service in the United Kingdom. Almost all of these were part of the three principal ATM networks (LINK, MINT and FOUR BANKS). There are no bridges between these networks, although some bilateral arrangements between institutions belonging to different networks do exist. All forms of payment cards issued in the United Kingdom (debit cards, credit cards, charge cards and dedicated ATM cards) *may* have a facility to enable ATM withdrawals to be made.

In 1992 some £46 billion was withdrawn by card holders from bank ATMs and an estimated £7.9 billion from building society ATMs. The average value of each bank machine withdrawal was £47, while that of each building society machine was estimated at £50. Each bank and building society machine was used an average of over 1,200 times per week, though with considerable variation between networks and individual machines.

In addition to cash withdrawals some ATMs enable their users to order new cheque books or statements and make balance enquiries and deposits. More advanced ATMs allow customers to make bill payments, funds transfers between their accounts, standing order inquiries and to order eurocheques.

#### *2.2.6 Home banking*

Home banking has existed in a variety of principally electronic forms for some time, based on the use of either screens or telephones connected to electronic keyboards. More recently, several of the major banks have introduced telephone-based personal banking services, staffed by telephone operators and bankers rather than being operated by digital or voice recognition systems. Some of these services are offered on a 24-hour basis.

### 2.3 Recent developments

The major UK banks are currently participating in the international S.W.I.F.T. EDI interbank pilot project. In October 1991 banks began to exchange standard EDIFACT payment messages over the S.W.I.F.T. network by incorporating them within a S.W.I.F.T. "envelope" message. At the same time, five of the United Kingdom banks set up the Interbank Data Exchange (IDX) system which has allowed the banks, since January 1992, to exchange similar standard interbank messages within the United Kingdom. This has now been established as a permanent service. The IDX banks have invited other banks to join, though none have yet responded. In both systems, banks act as intermediaries for their corporate clients, with whom they are connected via whatever network is mutually acceptable. Interbank settlement relating to IDX exchanges, which are currently confined to sterling, and to any sterling exchanges arising from the S.W.I.F.T. EDI interbank pilot project, are made through CHAPS. In 1992, APACS joined forces with a number of other organisations in a major drive to raise awareness among industrial and commercial customers of financial EDI. Initiatives launched so far include the issue of a booklet describing financial EDI and the establishment of a single United Kingdom body for the organisation of all EDI standards-making activity.

Another programme involves work on the legislative changes and the practical preparation which would be necessary if truncation were to be introduced in the cheque clearing.

The payments industry has been looking at ways of reducing cheque and plastic card fraud. In 1992, a number of short-term measures were implemented. These included more secure methods of delivering new cards to customers, the establishment of an alert service to assist merchant acquiring banks in identifying suspect merchants and new dynamic floor limits for several merchant categories in the higher fraud risk retail sectors and an extensive public awareness campaign. As a result of these measures, the total amount of cheque and plastic card fraud, which had been increasing rapidly, began to decrease slightly. Longer-term measures are also being considered, for example the use of PINs at the point of sale in conjunction with a Card Authentication Method (CAM) to prevent counterfeiting, Cardholder Verification Methods (CVM) and the use of biometric techniques. Several banks have introduced photocard schemes in an attempt to reduce card fraud (these have been very successful on a limited scale).

## 3. INTERBANK EXCHANGE AND SETTLEMENT CIRCUITS

### 3.1 General overview

This section provides a detailed description of the two large-value clearing systems in the United Kingdom; CHAPS (Clearing House Automated Payment System) and the Town Clearing.

CHAPS, which started operation in 1984, is a nationwide electronic interbank system for sending irrevocable guaranteed unconditional sterling credit transfers of any amount from one settling participant (hereafter referred to as a "settlement bank"), on behalf of itself or its customers, to another settlement bank for same-day value. CHAPS currently handles 95% by value and 99% by volume of high-value same-day payments. After a long period of steady growth, the market for CHAPS and Town payments reached a plateau in 1990. There was virtually no growth in CHAPS values and volumes in 1991 (which may have been partly attributable to the recession and to the introduction of CMO), but values and volumes rose again in 1992. This growth may have been partly due to the reduction (from £5,000 to £1,000) in the threshold for CHAPS payments from January 1992. From January 1993, the minimum threshold has been removed completely. Over the eight months to August 1993 the volume of transactions increased, while the average transaction value fell by 10%. Total value of payments through CHAPS was £20,928 billion in 1992, representing a turnover of United Kingdom GDP every seven days. On the busiest day, the single day's transactions amounted to the equivalent of a quarter of GDP.

The Town Clearing provides a mechanism for the same-day clearing and settlement of high-value sterling paper debit instruments within the limited geographical area of the City of London. The Town Clearing has been operating in its present form since 1946, but is directly derived from clearing arrangements which have been in existence in the City of London for over 200 years. It is essentially still a manual system, although some of the settlement banks carry out some electronic processing of items prior to sending them to the Settlement Centre. The value of payments through the Town Clearing continues to decline, from £39 billion per day in 1988 to only £3 billion per day in the latter half of 1993. Contributory factors are the increases in the minimum threshold (from £10,000 to £100,000 in 1989, rising to £500,000 in July 1991) and the migration from Town to other UK payment systems, for example CGO (Central Gilts Office) and CMO (Central Moneymarkets Office) (see Section 4.2.1). In 1992, £8,916 billion of payments were made in settlement of transactions in CGO and CMO combined, compared with only £1,387 billion of payments through Town. (For the structure, ownership and control of the Town Clearing and of CHAPS see Section 1.4.1.)

In addition to CHAPS and Town there are also two large-value settlement systems of more limited application in the United Kingdom; the Central Gilts Office (CGO) and the Central

Moneymarkets Office (CMO). The funds transfers with which these systems are concerned relate to sterling transactions, respectively, in United Kingdom government stocks and in money market securities. (For descriptions of these systems see Section 4.2.1.)

Three other major interbank payment systems deal with high volumes of mainly low-value payments. The Cheque Clearing and the Credit Clearing handle paper debit items (e.g. cheques) and credit items (e.g. bank giro payments) respectively, and are run by the Cheque and Credit Clearing Company Ltd. BACS Ltd. is a batch clearing system for both debit and credit electronic funds transfers. (For a fuller description of the types of payments handled by BACS Ltd., see Section 2.2.) All three work on a three-day processing cycle, and are not seen as suited for use by financial markets, which are mainly geared to a shorter processing and settlement cycle. As a result, the average value of a transaction in these clearings is much smaller, ranging in 1992 from £440 in BACS to £617 in the credit clearing.

For each of these systems the clearing process determines, in respect of payments exchanged between the members for their own and their customers' account, (1) how much each settlement member owes each other member (the "pay" amount) and how much it is due to receive from each of them (the "charge" amount), (2) the bilateral net pay or charge position (or net debit or credit position) of each member with respect to each other member, and (3) the sum of these bilateral positions (the "multilateral net" amount), which represents a member's overall debit or credit position in that clearing.

To facilitate the operational side of making payments, a nation-wide system of unique codes is employed to identify clearing members and, at each clearing member's discretion, their branches and major banking customers. These sort codes are printed, together with a code identifying the customer's account, on such instruments as cheques and giro credits in machine-readable form.

## 3.2 Structure, operation and administration of major large-value systems

### *3.2.1 Major legislation, regulations and policies*

There is no specific legislative framework governing the operations of any of the United Kingdom payment systems.

Most of the instruments handled through the Town Clearing are cheques or other bills of exchange, and as such are subject to the provisions of the Bills of Exchange Act, 1882, the Cheques Acts, 1957 and 1992, and of extensive case law, including on such matters as the respective responsibilities and obligations of the presenting bank and the paying bank. With regard to CHAPS, there is as yet no legislative framework for the handling of electronic payments in the United Kingdom, nor indeed much relevant case law.

The operations of all the clearings are subject to rules set by the members, through the clearing companies and APACS (see also Section 1.4.1). The criteria for membership are laid down explicitly in the rules of APACS. Under these rules, membership of CHAPS and the Town Clearing is linked; the Articles of the clearing company do not permit a bank to be a member of only one of the two.

Any institution applying for membership must be appropriately supervised. From 1st January 1993, this has been taken to mean a bank supervised under the Banking Act, 1987; or a building society supervised under the Building Societies Act, 1986; or a credit institution which is incorporated in any other Member State of the European Community, and is authorised, by a competent authority as defined in European legislation, as a credit institution permitted to provide money transmission services. The applicant must agree to pay an entry fee and a share of the operating costs. It must meet the technical and operational requirements of the clearing, and meet a

minimum volume criterion of 0.5% of the aggregate of items handled in the CHAPS and Town clearings.[5] The applicant must also obtain the explicit agreement of the Bank of England to provide settlement account facilities for use in those two clearings. There are currently only fourteen settlement members of CHAPS and the Town Clearing, one of which is a bank incorporated outside the United Kingdom, though other financial institutions may participate in CHAPS through agency arrangements with one of the settlement members, or in the Town Clearing as a customer of one of the members. Two further settlement members, both incorporated in the European Union, will join CHAPS in mid-1994.

Settlement of all the clearings takes place on a multilateral net basis over accounts at the Bank of England after the close of business. Settlement is deemed to have been completed when the Bank of England notifies the settlement banks by telefax, normally at about 19.00 each evening.

### *3.2.2 CHAPS*

CHAPS is an electronic clearing, handling credit transfers. There is no minimum or maximum limit to the value of each transfer, but in practice the average value is large (£2.3 million in 1992). CHAPS payments are guaranteed and unconditional same-day sterling credit transfers, which the sending bank gives an irrevocable undertaking to settle once the CHAPS payment message has arrived at and been automatically acknowledged by the receiving bank.

#### *(a) Participants in the system*

Fourteen banks, including the Bank of England, are currently settlement members of CHAPS and the Town Clearing.

The settlement members of CHAPS send and receive CHAPS payments directly between themselves on a bilateral basis via a packet switching service; there is no clearing house. CHAPS settles on a multilateral net basis at the end of each day across accounts held at the Bank of England. The CHAPS members have 13,500 branches in the United Kingdom, all capable of initiating and receiving CHAPS payments. There are also over 400 financial institutions which, by virtue of agency agreements with settlement members, can have CHAPS payments addressed directly to themselves, through their agency account. They can also, subject to any intra-day limits agreed as part of the technical and business relationships with their settlement members, initiate outgoing CHAPS payments either by a direct terminal link to their settlement bank's payment system, or by a request to a branch of the bank to make the payment, or by using S.W.I.F.T. to pass payment instructions to a CHAPS settlement bank. Their settlement members, which are totally responsible for these activities, settle on their behalf at the end of each day. In addition, a large number of major corporate customers can, by virtue of account arrangements with one of the settlement members, or with an indirect participant, be advised on-line of the receipt of CHAPS payments for their account, and can request outgoing CHAPS payments to be made.

#### *(b) Types of transaction handled*

Provided they are unconditional same-day sterling credit transfers, there are no restrictions on the type of transactions handled. CHAPS payments originate not only in the financial markets in London, but also in the foreign exchange and other financial markets around the world, as well as in any other field requiring high-value sterling payments.

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5 Alternatively, an applicant may demonstrate that it will be able to achieve the required volume of business within 12 months of going live in CHAPS or the other APACS clearings.

### *(c) Operation of the transfer systems and the transaction-processing environment*

CHAPS transfers are all electronic. The system is designed to create, encrypt, authenticate and transmit a CHAPS payment message between two settlement banks. Commencing in November 1993, following the close of normal business at 3.10 p.m., a twenty-minute settlement period was introduced. The only payments which may be input during this period are those consequent upon a contractual obligation to settle a sterling moneymarket transaction entered into for the purpose of achieving agreed end-of-day balances. The reason for making this change was to enable such payments to be brought within the settlement risk controls being developed within CHAPS. The system finally closes at 3.30 p.m., at which point each settlement bank has to report its gross figures for payments exchanged with every other settlement bank to the Bank of England. The Bank of England then matches and verifies these figures and initiates the settlement process on a multilateral net basis on its books.

The receiving bank has the responsibility of advising its beneficiary indirect participant or other customer. How quickly and by what means this advice is given and the time at which the customer may have access to the funds is a matter to be agreed between the bank and its customer, subject to a non-mandatory minimum service level code drawn up by the CHAPS and Town Clearing Company Ltd.

### *(d) Settlement procedures*

The CHAPS rules state that a payment which has been sent and acknowledged is irrevocable, guaranteed and unconditional. This means that once a CHAPS settlement member sending a payment has put its name to it, it is committed to that payment, even if at the end of the day the originating customer does not have the funds to meet that payment.

The receiving settlement bank is obliged to give the beneficiary indirect participant or other customer value by the end of that day. The operational procedures of the system do not make it possible to ensure that a payment will reach the receiving settlement bank, or its customer, by a specified time within the working day but a settlement bank receiving a CHAPS payment within the day for credit to a customer will normally give that customer good value at that point, and will be prepared to make an outward CHAPS payment for that customer, backed by that intra-day receipt.

Since CHAPS payments are guaranteed, unconditional and irrevocable, there are no provisions for the return of payments or revocability. If it is discovered that a payment has been made in error, then the receiving bank may agree to initiate a further payment to reverse the transaction, but not necessarily through CHAPS. Further, no rules or regulations exist to cover the possible unwinding of the CHAPS daily settlement, and there has never yet been an instance where such action has been necessary.

### *(e) Back-up solutions*

CHAPS' rules provide for contingency arrangements if, for operational reasons, settlement cannot be completed in the normal way. If one member cannot reconcile its figures with one or more other members within five minutes of the end-of-day cut-off time (at 3.30 p.m.), the affected member can send its settlement figures to the Bank of England through an override procedure. It is still the responsibility of this member to reconcile its figures with every other member. Similarly, if a settlement bank does not receive the expected acknowledgement of the settlement figures from the Bank of England within fifteen minutes of the close of business, it can override the mechanism to complete the end-of-day system processes. The settlement member concerned continues to be responsible for ensuring that the Bank of England receives its final settlement figures.

Each settlement member has individual contingency arrangements with other settlement members in the event of a systems failure during the day, whereby data on its incoming payments can

be captured on magnetic tape for processing when its internal system has been restored. The bank suffering the failure may need to resort to the Town Clearing to effect its outgoing payments. These arrangements are the responsibility of each bank, subject to some commonly agreed rules.

### *(f) Credit and liquidity risks and their management*

#### *(i) Customer credit risk (settlement banks vis-à-vis customers)*

By contrast with the Town Clearing, each settlement bank in CHAPS can choose the nature and extent of the facilities it is prepared to grant to its participants and other customers in respect of the origination of CHAPS payments. This choice depends to some extent on whether the sending bank maintains its accounts in on-line real-time mode, and whether it is therefore in a position to monitor its gross, or net, intra-day exposure to its participants and customers. A member can give its customers an intra-day limit, net or gross, or it can apply individual authorisation to each payment. It is not obliged to act on every instruction to make a payment that its indirect participants want to make through CHAPS. It is left to each settlement bank to monitor and control its intra-day exposure to its participants and other customers. In practice competitive pressure in the market may limit the scope for such monitoring and control.

The extent of the benefits which the member banks may derive from CHAPS in terms of controlling customer risk is reduced by virtue of the uncertainty about customer exposure levels in the Town Clearing. Thus banks may be asked to make CHAPS transfers for their customers on the basis of incoming payments through the Town Clearing. In such circumstances, the bank runs the risk that some or all of the Town items will be refused. The coexistence of Town and CHAPS has in the past been one of the major difficulties for banks trying to control their exposure to their customers, particularly to customers in the financial markets. It should be noted, however, that the relative importance of the Town Clearing is diminishing (see Section 3.3), to the extent that the average daily turnover in the Town Clearing at the end of 1993 was less than 5% of the average daily CHAPS turnover. The exposure caused by the coexistence of the two clearings has therefore diminished substantially.

#### *(ii) Interbank credit risk (settlement banks vis-à-vis each other)*

The protection that CHAPS provides to payee customers, by way of final settlement, is achieved through the settlement banks explicitly accepting daylight exposures to each other. If a settlement bank accepts an incoming payment message, it has to guarantee to make the funds available to the payee customers even if the sending banks should fail to settle for the payments at the end of the day.

The exposures in the system are, by explicit agreement, the bilateral net positions between the settlement banks (not each bank's multilateral net position, although for operational convenience it is the latter figures that are used when settlement takes place at the end of the day). In 1992 the rules and system architecture of CHAPS were modified to enable each settlement bank to set a limit on its bilateral exposure to each of the other settlement banks. These bilateral net receiver limits are entirely under the control of the bank concerned, which can set them at any level and change them whenever it likes (including during the day). During 1993 net sender limits (constraining the *multilateral* net debit position of each bank) were also introduced as a further means of reducing risk; for the time being, these net sender limits are self-assessed, subject to guidelines set by the CHAPS and Town Company. They are not collateralised, nor is there a loss-sharing agreement. (See also Section 3.3.)

*(iii) Liquidity risk*

Liquidity risk in all the clearings stems from the possibility that a settling member may be unable to fund its overall debit position in all the clearings at the close of business. The liquidity risk that flows from this is at present borne by the Bank of England: there is no practical way in which it can be managed or controlled within the present system, in which there is no explicit provision for the unwind of the clearing. (See also Section 3.3.)

### *3.2.3 Town Clearing*

The Town Clearing is restricted to cheques and other paper instruments of £500,000 and over and Bills of Exchange drawn on and paid into Town Clearing offices or branches (certain offices or branches in the City of London) of member institutions.

#### *(a) Participants in the system*

Fourteen banks, including the Bank of England, are settlement members of CHAPS and the Town Clearing.

If any bank, corporation, or service provider wishes to use the Town Clearing system, it must do so through an account relationship with the Town Clearing branch of a member bank. The Settlement Centre is purely an exchange venue. It does not act as principal in the clearing.

#### *(b) Types of transaction handled*

The Town Clearing is used for same-day clearing of sterling high-value paper debit instruments. Since it is currently the last clearing to settle at the end of the banking day, members also use it to adjust the impact on their books (and on their operational balances at the Bank of England) of that day's CHAPS settlement (this may well lessen with the introduction of the 3.30 p.m. cut-off for CHAPS settlement payments - see Section 3.2.2 (c)), and of the settling of other obligations (including those arising from the operations of the CGO/CMO and of the three-day cycle clearing systems (see Section 3.1)). The Town Clearing processes bankers' cheques and drafts, bankers' payments and Town cheques.

#### *(c) Operation of the transfer systems and the transaction-processing environment*

Town Clearing instruments are paid in for credit to a customer's account at a member's branch in the City of London during the business day. At 15.00 the members close for normal business and the paper items are presented to the paying banks in the Settlement Centre before 15.50. After the banks are agreed on their multilateral net settlement totals, the Bank of England completes the net settlement across its books and notifies the settlement banks of that fact, usually by 19.00.

#### *(d) Settlement procedures*

The Town Clearing rules on settlement merely state that the day's multilateral net debits and credits are posted to members' accounts at the Bank of England the same evening. There are no rules laid down regarding finality.

#### *(e) Back-up solutions*

Alternative premises in the City of London have been identified for use at short notice by the Town Clearing in the event of the Settlement Centre not being available because of some disaster.

In addition, the Town Clearing banks have contingency arrangements with one another in the event of an individual bank's own paper clearing centre being immobilised.

#### *(f) Credit risk and its management*

*(i) Customer credit risk (settlement banks vis-à-vis customers)*

The Town Clearing presents considerable difficulties in terms of the monitoring and control of customer credit exposures. The bank of the recipient of a Town Clearing cheque (the collecting bank) faces the risk that the payer may countermand the cheque or that the payer's bank may refuse to honour it. The paying bank in the Town Clearing can in principle control its exposure to a customer, but in practice it has a very short time to consider and decide on whether to agree to honour its customer's cheque; it may have had no prior notice of the cheque and it probably has a far from complete picture of that customer's overall financial position, taking into account that day's transactions in all the clearings.

*(ii) Interbank credit risk (settlement banks vis-à-vis each other)*

Credit risk between the settlement banks in the Town Clearing only arises when a settlement bank accepts for its own account a payment drawn by another settlement bank. The risk, however remote, is that the paying settlement bank will not be able to settle for this payment and that the Town Clearing may have to be unwound. In this case the payee settlement bank will have an overnight, or longer, exposure to the paying settlement bank. It is left to each settlement bank to monitor and control its credit risk in this regard.

### *3.2.4 Pricing policies*

For both CHAPS and the Town Clearing, the fee a settlement bank charges its indirect participants or customers is a matter for commercial negotiation between the parties concerned; these charges may be on a per item basis, or as part of a package negotiated by the bank with its customer.

In these two large-value clearings, the settlement banks have to pay an entry fee on joining the system, plus a share of its operating costs (normally set in proportion to their share of the total volumes and use of facilities). Settlement banks do not themselves have to pay any per item fees for the use of the system.

## 3.3 Main projects and policies being implemented

A programme of work is under way to reduce credit and liquidity risk in the UK payment systems, particularly the large-value systems. This programme includes a package of short and longer-term measures. A first stage in this has been to increase the minimum size of payments through the Town Clearing; the most recent increase being from £100,000 to £500,000, implemented in 1991. This measure, together with the opening of CMO in 1990, has greatly reduced the amount of business passing through the Town Clearing. (See also Sections 4.2 and 5.4.)

Within CHAPS, the short-term measures include the introduction of (a) bilateral net receiver limits; (b) an interbank agreement that the exposures in the system are the bilateral net amounts; (c) a central monitoring system, operated by the CHAPS Inspectorate at APACS, to observe and, to a limited extent, manage the operation of the system; and (d) the introduction of self-imposed net sender limits.

The longer-term measures centre around the decision to develop CHAPS into a system based on real-time gross settlement; this change is planned to take place from the end of 1995.

# 4. SPECIAL USE OF INTERBANK TRANSFER SYSTEMS FOR INTERNATIONAL AND DOMESTIC FINANCIAL TRANSACTIONS

## 4.1 Exchange and settlement systems for international transactions

### *4.1.1 General overview*

The population of banks in the United Kingdom is international. Of a total of approximately 500 banks currently authorised to operate in the United Kingdom, around 340 are foreign-owned branches or UK-incorporated subsidiaries of foreign banks. UK-based banks also have an extensive presence abroad.

International funds transfers of large value are mainly effected through cross-border correspondent banking relationships (which may reflect ownership links but may equally be purely commercial arrangements).

The main means of message transmission by which payment instructions are conveyed internationally is S.W.I.F.T. Only banks, building societies, certain listed money market institutions and EC-incorporated credit institutions are eligible for full membership of S.W.I.F.T. in the United Kingdom, although certain other categories of financial institution (notably brokers and dealers in securities) may also participate to exchange restricted categories of messages through the system. Customers of banks and building societies cannot make direct use of S.W.I.F.T. to send payment instructions; they must submit their instructions via their banks.

The major UK banks are currently participating in the S.W.I.F.T. EDI interbank pilot project. (See Section 2.3.)

Where S.W.I.F.T. is not available, tested telex is used.

### *4.1.2 Retail transactions*

There are a number of means by which retail cross-border transactions can be effected, some of which are designed to meet specific needs.

(a) ***Travellers cheques*** are available in a number of major currencies. They are negotiated for cash by travellers and presented for payment through the retail clearings to the issuing bank or, in the case of a non-bank issuer, to the issuer's bank.

(b) ***Eurocheques***, accompanied by eurocheque guarantee cards, are offered by many UK banks and building societies and may be used as a payment medium up to a given limit per cheque in continental Europe and a number of non-European countries. A single bank in the United Kingdom operates the UK National Eurocheque Clearing Centre.

(c) ***Credit and debit cards*** issued by UK institutions are increasingly usable abroad. Both VISA and Access/MasterCard/Eurocard are part of international networks. Several reciprocal arrangements also exist between UK institutions and institutions abroad for the sharing of ATM facilities. Several UK banks issue ATM-compatible eurocheque cards, which provide access to ATMs in most of the Uniform Eurocheque Scheme member countries. The ATM facilities of these same two banks in the United Kingdom are accessible to holders of eurocheque cards issued abroad. In 1987 a reciprocal agreement was concluded between LINK and PLUS (the ATM network operating in North America, Japan, Australia, Mexico, Singapore, Hong Kong and the Caribbean). Several UK banks' ATMs provide access to Cirrus cardholders. There are, in addition, a number of bilateral agreements between particular banks and building societies in the United Kingdom and the providers of ATM facilities in certain other European countries.

(d) ***Currency clearings***

The domestic clearings described in Section 3 all relate to payments in sterling, but under the APACS umbrella there also exist in London foreign currency clearings for ten major currencies, through which it is possible to transfer value between foreign currency accounts with banks in the United Kingdom (the Currency Clearings do not handle items drawn on banks outside the United Kingdom - those items have to be sent for collection or negotiation to the countries concerned). There are seven members of the Currency Clearings who each handle all currencies and who act as settlement members for some ninety indirect participants.

The Currency Clearings handle cheques, drafts, banker's payments and mandated currency debits drawn on, or payable at, UK branches of members and participants. These arise principally from commercial transactions. Bank-to-bank wholesale payments are explicitly excluded. The main currency handled is the US dollar, for which a same-day payment service is available. The other currencies handled, on a three-day clearing cycle, are the French franc, Deutsche Mark, Canadian dollar, Italian lira, Dutch guilder, Australian dollar, Japanese yen, Swiss franc and Spanish peseta.

The volumes handled in these clearings are quite small, and in 1992 totalled around 650,000 items, of which some 57% were US dollar items.

For each of the Currency Clearings one member acts as the system's settlement agent, with net settlement between it and the other banks being effected across accounts held in the country of issue of the currency concerned. In the case of the US dollar clearing, each member bank acts as overall settlement agent for a two-month period.

(e) ***Automated cross-border retail payments***

Arrangements may be made between particular banks to facilitate retail payments. These may cater for regularly occurring or one-off cross-border payments. A number of different schemes based on alliances of different groups of banks have been initiated. The European Commission is keen to encourage the formation of electronic links between automated clearing houses throughout Europe and a pilot scheme to test such linkages is currently under consideration in a number of countries including the UK through BACS Ltd.

### *4.1.3 Large-value transfers*

Large-value transfers in sterling, in settlement of international transactions, take place for the most part through CHAPS. (For more details on CHAPS, see Section 3.2.)

Large-value transfers in other currencies take place through systems abroad by way of correspondent bank members of the relevant clearings. A UK customer would instruct their UK bank who in turn would instruct their correspondent bank to make a payment to the beneficiary's bank.

Eleven banks in London, including US, Swiss and Japanese banks, are active in the ECU market and are members of the ECU Banking Association's Clearing and Settlement system which handles ECU-denominated payment orders sent between 44 clearing banks located across the EC, with settlement taking place across accounts held at the Bank for International Settlements in Basle. In order to assist steps being taken to strengthen the private ECU clearing and settlement arrangements, the Bank of England put in place collateralised liquidity facilities for the London-based members of the ECU Clearing in March 1993.

A number of banks in London are active members of the FX NET bilateral netting scheme for foreign exchange obligations.

## 4.2 Exchange and settlement systems for securities transactions

This section looks at the operations of the UK securities markets, with particular reference to the links between securities transfers and payment systems. The United Kingdom has major securities markets in both domestic and international equities, debt securities (including Eurobonds), money market instruments and UK government stock. There is also a thriving market in derivatives based on these instruments and foreign government stock. The main participants in these markets are the members of the London Stock Exchange (the Stock Exchange) and/or the London International Financial Futures and Options Exchange (LIFFE), as well as banks and institutional investors such as pension funds and insurance companies.

Under the Companies Act, 1985, all companies incorporated in the United Kingdom must maintain a register of members (i.e. shareholders). Most listed bonds are also registered. The task of recording ownership is generally undertaken by commercial registrars, the largest of which tend to be subsidiaries of the major banks. The Bank of England acts as registrar for UK government stock and some other stocks.

### *4.2.1 The institutional framework*

#### *(a) Types of securities transaction*

(i) ***UK equities and UK-listed debentures and loan stocks*** and listed securities are traded mainly on the Stock Exchange. Off-exchange trading does take place but is believed to be very small in relation to the size of the organised market. Trading is carried out over the telephone using a screen-based quotation system called SEAQ, which displays firm two-way prices of competing market-makers.

(ii) ***UK government stock*** is also traded mainly on the Stock Exchange. Indicative quotations are displayed to investors by market-makers in government stock using a variety of wire services with trading conducted over the telephone. Trades are subsequently settled via the Central Gilts Office (CGO); the book-entry transfer system run by the Bank of England.

(iii) There is a significant level of over-the-counter (OTC) ***derivative activity*** in London (warrants, options, swaps, etc.). Additionally, derivatives (futures, options and options on futures) in the form of standardised contracts are traded on five exchanges. Commodity derivatives based on metals, energy and soft commodities are traded on the London Metal Exchange (LME), International Petroleum Exchange (IPE), and London FOX respectively. Financial and equity derivatives are traded on the London International Financial Futures and Options Exchange (LIFFE), formed by the merger of LIFFE and the London Traded Options Market in March 1992, and the London Securities and Derivatives Exchange (OMLX).

LIFFE's contracts comprise futures and options on futures on UK and international government bonds, short-term interest rates, equity indices and options on individual equities. The majority of trade is conducted by open outcry on the exchange floor. After hours, contracts are also traded on the exchange's screen-based trading system, APT (Automated Pit Trading) on which one contract is traded exclusively. OMLX, the London subsidiary of the Swedish options exchange, OM, primarily trades Swedish equity contracts on an automated trading system linked to that of its parent.

(iv) Of the ***international securities***, equities are traded via a screen-based quotation system run by the Stock Exchange. Named SEAQ International, it is very similar to the domestic SEAQ system and relies upon telephone inquiry and trading. Eurobonds and short-term Euro-currency paper have no organised markets and rely entirely on telephone inquiry and trading. Most sterling Euro-bonds are listed on the Stock Exchange and a large proportion (about 70%) of all Euro-bond trading takes place in London.

(v) ***Sterling money market instruments*** are traded by telephone. Trades are subsequently settled for the most part through the Central Money Markets Office (CMO), the second book-entry transfer system run by the Bank of England. (For the Bank of England's operations in these markets in the context of monetary policy see Section 5.3.)

### *(b) Organisations involved in securities exchange and settlement*

There is no central depository for investors' holdings in the United Kingdom as recommended in the report published by the Group of Thirty.[6] However, there are plans to create a single depository for each of the major groups of instruments within each settlement system.

In the early 1980s the Bank of England and the Stock Exchange agreed jointly to develop and finance a project to provide participants in the market in UK government stocks (gilt-edged stocks) and in certain other stocks registered at the Bank of England with a computerised book-entry transfer and associated payment system for the settlement of their transactions. This became known as the Central Gilts Office (CGO), which has been operational since January 1986. It is operated by the Bank of England.

The desirability of a similar book-entry transfer and payment system for sterling money market instruments was equally apparent, and, after the failure of an attempt by the market to develop such a system in 1986-88, the Bank of England decided to develop the Central Moneymarkets Office (CMO). After a two-year consultation and implementation programme, the CMO began operations in October 1990, facilitating the settlement of trades and the movement of collateral to secure borrowings.

The Stock Exchange operates a system called TALISMAN, which settles UK equities and domestic corporate issues. Within TALISMAN, the Stock Exchange maintains a central nominee, known as SEPON, which acts as a form of depository for equities and bonds on the trading books of market principals. Information is kept in electronic form to facilitate book-entry transfer for securities in the course of settlement. The transfer of holdings within SEPON occurs before the final legal transfer of title and is not synchronised with final payment. Securities are issued in physical form and transferred out of SEPON if they are to be held by non-market principals.

The London Clearing House (LCH) provides central facilities for registering, clearing, guaranteeing and settling contracts for its members on LME, IPE, FOX, and LIFFE. Since the LIFFE/LTOM merger, LCH has taken over full responsibility for clearing and guaranteeing equity options from the London Options Clearing House. LCH is jointly owned by six UK settlement banks and is independent of the exchanges and the clearing members for whom it acts. OMLX clears and guarantees transactions undertaken on its market, acting as an integrated exchange and clearing house.

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6 Group of Thirty Report (1989), Clearance and Settlement Systems in the World's Securities Markets.

### *(c) Structure, operation and administration of the exchange and settlement systems*

#### *(i) Central Gilts Office (CGO)*

The CGO system enables transfers of stock to be made and settled between CGO members by electronic book-entry transfer, and covers UK government stock and certain other stocks which are registered at the Bank of England. Associated with this is an assured payment system which works on four principles, namely: the purchaser's settlement bank, which must be a settlement member of the CHAPS and Town Clearing Company Ltd., gives an unconditional undertaking that at the moment that stock is transferred from the seller, that bank takes on an irrevocable commitment to effect payment the same day to the seller's bank; the settlement bank's exposure under this unlimited commitment can be covered by a floating charge over all stock held in its customer's CGO account and by a fixed charge over monies receivable; the CGO automatically checks that the consideration of the transaction lies within a narrow margin of the market value of the stock; and the CGO ensures that stock leaves a member's CGO account only against an irrevocable payment commitment from another member's bank.

Before joining the CGO service each prospective member must enter into contractual agreements with its settlement bank, in respect of the CGO's assured payment system, and with the Bank of England (CGO). There are also two sets of agreements between the CGO and the settlement banks - the duties of the banks to one another are set down in a single global agreement, whilst the banks' direct relationships with the Bank (CGO) are governed by separate bilateral agreements.

There are currently around eighty direct CGO member firms, comprising market-makers in government stock, Stock Exchange money brokers, inter-dealer brokers, discount houses, banks, broker-dealers and institutional investors. In addition, there are many more indirect CGO members, who do not have CGO accounts, but who are able to access the CGO service through agency arrangements with a direct member. These indirect members include both institutional investors, such as pension funds, investment trusts and insurance companies, and private companies.

Movement of stock across CGO accounts is initiated by the seller and is dependent upon both the seller having sufficient stock available on his CGO account and the buyer positively accepting the offer of stock. An irrevocable payment instruction is generated under the Assured Payment System simultaneously with (but in the opposite direction to) the movement of stock between CGO accounts.

The CGO Assured Payment System has the effect of converting the buyer's liability into an irrevocable commitment on the part of the buyer's bank to effect payment on the same day as the transfer of stock. The movement of funds takes place at the end of the day on a net basis over the accounts of the settlement banks at the Bank of England. In 1992, £6,862 billion of payments (net) were made through CGO, in respect of 678,200 transactions.

#### *(ii) Central Moneymarkets Office (CMO)*

CMO provides an electronic book-entry transfer and payment system for a variety of sterling bearer instruments, i.e. Treasury bills, local authority bills, bank bills, trade bills, bank and building society CDs and commercial paper. For these instruments CMO provides a comprehensive range of settlement functions.

There are currently around fifty institutions which are members of CMO. Before joining the CMO service each prospective member must enter into contractual agreements similar to those described in the case of CGO. Each CMO settlement bank must also enter into an agreement with the Bank of England (CMO). CMO members have a book-entry account in their own name and make arrangements for a settlement bank to make and receive payments on their behalf for instruments transferred from and to other direct members. Over two hundred firms also participate indirectly in

CMO through agency arrangements with CMO members. In 1992, £2,054 billion of payments were made through CMO, in respect of 247,600 transactions.

In the CMO system, the transfer of ownership of money market instruments is initiated by the seller and is dependent upon the seller having the instruments on his account and the buyer positively accepting the offer of instruments. Transfer of the instruments from seller to buyer is accompanied by the simultaneous transmission of the payment instruction in the opposite direction. As with CGO, the movement of funds takes place on a net basis at the end of the day, over accounts at the Bank of England. The status of a CMO payment is the same as a cheque; unlike CGO, payments are not assured and a purchaser's settlement bank may, in exceptional circumstances, refuse to make one or more payments. However, since CMO was set up there has been no instance of a purchaser's settlement bank refusing to make a payment.

*(iii) TALISMAN*

The settlement system currently in use in the Stock Exchange, known as TALISMAN, is a computerised system which operates on the basis of data on trades which Stock Exchange members transmit to the Stock Exchange by the close of business each day. A contract is established between the two trading parties at the time of the trade.

There are two categories of Stock Exchange member, market principals and others. Trades which involve either those Stock Exchange members who are not market principals or the non-member clients of Stock Exchange members must be traded and settled through an agency agreement with a market principal.

Details of a day's trades received by the Stock Exchange from its members are matched through the Exchange's computerised matching system, known as CHECKING, which runs overnight. Whereas CHECKING matches trades where both parties are market participants, the Institutional Net Settlement (INS) positive acceptance service is essentially an accounting facility which notifies non-market institutional participants of the net payment due to or from them in respect of their transactions with market-makers.

All trades between market principals are held in SEPON, a form of depository, in which the details of each security are captured in electronic form with settlement achieved by book-entry transfer. Market principals are the only group to hold stock in SEPON; for other Stock Exchange members and for non-members SEPON acts as an intermediary. When securities are to be sold by a Stock Exchange member other than a market principal or by a non-member, they are deposited in SEPON for computerised transfer. Conversely, when stock deposited in SEPON is bought by a Stock Exchange member who is not a market principal or by a non-member, a new physical share certificate is issued when the stock is transferred back out of SEPON.

Payment between the Stock Exchange and the market-makers (including the Bank of England) is generally made through CHAPS or through the Town Clearing and, for smaller amounts, the cheque clearing. Settlement should occur on the second Monday following the end of the trading period ("the Account"), which typically runs for two calendar weeks. Therefore, trades made at the start of the Account are settled after fifteen business days. Although official settlement days usually fall approximately fortnightly, a trade that fails to settle on one settlement day may be settled on any subsequent business day. The settlement system operates every day to allow any unsettled trades to be completed as soon as possible.

*(iv) CREST*

Following the abandonment, in March 1993, of plans to replace TALISMAN with TAURUS (an automated system to dematerialise UK equity and other quoted corporate securities and provide a full book-entry transfer system for all stock movements), work is now under way on a new system, called CREST, which will provide stock accounts and book-entry transfer in UK corporate

securities for those who are members. These are likely to include brokers, market makers, institutional investors and custodians. Individual investors will most likely have access through nominee facilities. Investors will be able to choose to retain stock certificates, and transactions involving certificates will also pass through the central CREST system. CREST will provide Delivery-versus-Payment based on existing funds transfer mechanisms.

The Bank of England is currently leading the requirements definition phase of the CREST project. The new system is intended to go live in 1996. In the meantime, the UK market is actively preparing for the move to rolling settlement from the present cycle of two-week accounts. Rolling settlement is due to be introduced in mid-1994, initially at T+10, moving to T+5 at the beginning of 1995. The introduction of CREST, with real-time functionality, will prepare the way for an eventual move to T+3.

Long-term ownership of the CREST system has yet to be determined.

*(v) London Clearing House Protected Payment System (PPS)*

Settlement of transactions in derivative instruments is effected through the London Clearing House (LCH). Payments associated with futures and options contracts are made to and from LCH through the PPS. Under this arrangement, every clearing member maintains an account with at least one participating bank and the LCH maintains accounts with all twenty-seven banks. Payments are made by internal branch transfers between the accounts of the clearing members and LCH. There is thus no direct interbank clearing exposure in the payments between LCH and its members. However, the banks may take on a clearing exposure to a customer who is a clearing member if they commit themselves to crediting LCH before receiving funds from the clearing member. Where these funds are denominated in sterling, they may be sent to the PPS banks either through CHAPS or through the Town Clearing. Transfers in sterling and US dollars provide same-day value, whereas transfers in Deutsche Mark, yen, Italian lire, Swiss francs, French francs and ECUs are assured by the banks but for value the following day.

*(vi) Eurobonds and short-term Euro-currency paper*

Exchange, settlement and payment arrangements vary according to the nature and currency of the instrument. The market in the United Kingdom makes extensive use of the services provided by the two competing depository systems, Euroclear and CEDEL. Euroclear, established in 1968, is based in Belgium; CEDEL, established in 1971, is based in Luxembourg. Both offer a wide range of services as intermediate custodians, covering all the essential functions of international securities business. Neither Euroclear nor CEDEL holds securities in safe-keeping; both use other custodians which hold the securities.

## 5. THE ROLE OF THE CENTRAL BANK IN INTERBANK SETTLEMENT SYSTEMS

### 5.1 Present situation

#### *5.1.1 Statutory responsibilities*

There is no specific legislative framework governing the operations of any of the UK payment clearing systems, nor has the Bank of England any specific statutory responsibilities in connection with them. The Bank does not own, operate or manage any of the systems under the APACS umbrella. The Bank has, however, a clear interest in the quality of these systems, which

stems from its various core responsibilities as a central bank. Firstly, the discharge of its responsibilities for the implementation of monetary policy, and for the stability of financial markets in the United Kingdom, presupposes reliable and efficient clearing and settlement procedures. Secondly, the nature and extent of risks incurred by participants in payment and settlement systems, arising from their own and their customers' transactions, is of concern to the Bank in its capacity as banking supervisor under the Banking Act, 1987. Thirdly, the Bank has a direct operational interest in its capacity as banker to the banks, which means that it has itself significant exposure to banks through the clearing systems.

### *5.1.2 Establishment of common rules*

The rules governing the operations of each of the UK payment clearing systems, other than those associated with CGO and CMO, are laid down by their members through the relevant clearing company and the umbrella organisation, APACS. The Bank of England is a member of APACS and of the individual clearing companies as of right, as well as by virtue of the business it conducts, with the right to appoint a director to the board of each of the clearing companies. Although the legal powers the Bank enjoys from this representation are no greater than those of other members, its special interest is recognised on questions of public policy.

As a part of the debate, initiated by the Bank of England in 1989, on credit exposures in the wholesale payment systems, the settlement members of the clearings are now addressing ways of controlling settlement exposures on a consistent basis; for example by the introduction of CHAPS net sender and net receiver limits and the commitment to converting the system to provide real-time gross settlement from the end of 1995.

Explicit and published criteria are laid down by APACS for admission to settlement membership of each clearing (for further details see Section 3.2). These criteria include the agreement of the Bank of England to open a settlement account in its books in the name of the prospective member, for use in settling its position in the clearing in question.

The operations of CGO and of CMO are subject to rules embodied in standard contractual agreements between the Bank as operator of these services, the members respectively of CGO and CMO, and the relevant settlement banks.

In the Bank's capacity as banking supervisor, it does not currently impose any explicit liquidity requirements on intra-day exposures. Banks are, however, required to maintain adequate liquidity at all times and are subject to monitoring of their mismatch positions and of their available stocks of liquid assets.

### *5.1.3 Supervision and audit*

There is no framework, statutory or other, for the supervision or regulation of UK payment clearing systems whether by the Bank of England or by any other body. The principal object of APACS is to oversee and coordinate the operation, planning, development and standards of payment and transmission services within the United Kingdom.

As a member of APACS, the Bank participated in a regular audit of the central functions of CHAPS from 1988 to 1992, and has also been represented on the audit committee of BACS Ltd. CGO and CMO are subject to regular internal audit.

## 5.2 Provision of settlement facilities

### *5.2.1 Use of central bank accounts for payment services*

The Bank provides settlement accounts for institutions participating directly in the APACS clearings and for settlement banks in CGO and CMO. The opening of a settlement account requires a positive decision by the Bank; it is not a facility available as of right to every bank or building society in the United Kingdom. Settlement account balances are non-interest-bearing. Each bank holding such an account sets a target level at which it aims to maintain its overnight balance on the account.

The Bank also provides accounts to facilitate certain settlement arrangements external to the APACS clearings, for example, ATM network settlements between groups of banks and building societies.

Banks in the United Kingdom are not subject to reserve requirements for monetary policy purposes. Cash ratio deposits, which banks hold with the Bank of England as a means of financing the Bank's operations, are not available for use in the settlement process.

### *5.2.2 Role in gross settlement systems*

All APACS payment clearing systems operate at present on a net settlement basis.

### *5.2.3 Role in netting systems*

The bilateral netting in CHAPS is based on contractual agreements. The multilateral netting calculation involved in the other clearing systems is less legally certain, although some protection is provided, in respect of certain systems, by the banker's right of set-off under insolvency law. The Bank's role in these systems (in addition to being a member) is that of settlement institution, holding the accounts through which the banks' positions in each of the clearings are finally settled.

### *5.2.4 Role in the settlement of securities transactions*

The Bank's role in the settlement arrangements for secondary markets in securities (i.e. aside from its role as issuing agent for UK government securities) is confined to CGO and CMO. These settlement services cover, respectively, UK government securities, and money market instruments such as CDs, commercial bills and commercial paper. The settlement services involve transfer of title by book-entry, circumventing the need for stock transfer forms and stock certificates in the case of UK government securities and for physical delivery of bearer documents representing money market instruments. The settlement services provided by both CGO and CMO are accompanied by payment arrangements (described in Section 4.2).

The Bank is responsible for operating the CGO and CMO settlement and associated payment services.

### *5.2.5 Provision of credit facilities*

The Bank of England does not give any explicit or implicit undertaking to underwrite the settlement operations of the UK clearings. Credit facilities are specifically excluded on settlement accounts; banks and building societies holding these accounts are expected to keep them in credit overnight.

As a part of its normal open market operations, the Bank does, however, lend in sterling against security to discount houses, gilt-edged market-makers and Stock Exchange money brokers.

The Bank does not grant intra-day loans explicitly, nor does it normally lend outside the context of its open market operations. However, since settlement accounts in the Bank's books are debited/credited on a batch basis, implicit intra-day advances are made to the holders of these accounts.

#### *5.2.6 Pricing policies*

The Bank's charging policy is based on the principle of recovering the fully allocated costs of the banking services it provides.

### 5.3 Monetary policy and payment systems

#### *5.3.1 Existing relationships*

The Bank of England conducts open market operations in the sterling money market as the primary tool of monetary policy. These operations largely take the form of dealing in "eligible bills" (i.e. Treasury bills, eligible bills issued by UK local authorities, and bank bills accepted by banks whose acceptances are eligible for discount at the Bank) with a group of counterparties, seven of which are discount houses, authorised as banks under the Banking Act, 1987, and one of which is a market-maker in government stock. These institutions assume responsibilities geared towards maintaining the liquidity of the UK banking system. Specifically, they undertake to offer continuously, against security, deposit facilities at call to banks which are members of CHAPS and the Town Clearing, to make a continuous market with these counterparties in sterling money market instruments, especially "eligible bills", to participate actively in the Bank's money market operations, and to underwrite, collectively, the weekly tender of Treasury bills. The Bank's dealing counterparties have secured borrowing facilities at the Bank, of a size related to their capital.

When there is a shortage in the market, the Bank's operations take the form of invitations at specified times of day to its dealing counterparties to offer eligible bills either for outright sale or for sale and subsequent repurchase. The latest time at which the Bank may invite offers is 14.00. If, after this round of operations, a dealing counterparty finds itself short of funds, at 14.45 it may ask to make use of its borrowing facilities. It is also possible for a dealing counterparty to make a request to borrow later in the day, but such lending is at the Bank's discretion and usually carries progressively higher rates of interest. If an insignificant shortage or surplus is forecast, the Bank need not invite business. If a significant surplus is forecast, the Bank will invite bids for Treasury bills at 14.00. (Unless a very large surplus is forecast, the Bank will not usually invite bids before 14.00.)

#### *5.3.2 Influence of changes in payment systems on monetary policy*

The relationship between the operation of monetary policy and developments in the UK payment systems (see Section 3.3) is kept under review. (The banks' current use of the Town Clearing to adjust the impact on their books of daily settling of other clearing obligations is described in Section 3.2.1.)

### 5.4 Main projects and policies being implemented

The Bank is currently working on a number of initiatives, both domestic and international, which may in due course affect its role in payment clearings:

(a) The Bank is participating, in the forum of APACS, in efforts to identify and implement measures to reduce credit and liquidity risks in the domestic clearings, especially in the large-value systems. In CHAPS, short-term measures, in the form of multilateral net sender and bilateral net receiver limits, have been introduced in an attempt to control the

exposures. While short-term measures are designed at the least to control the exposures between the settlement banks and between each of those banks and the Bank of England, the longer-term objective is to reduce and where possible to remove them. To this end, it has now been agreed that the longer-term objective for CHAPS will be the introduction of real time gross settlement.

(b) RTGS will pave the way for the subsequent introduction of Delivery-versus-Payment in the sterling securities markets. Under RTGS a transfer of final funds during the day between the buyer's bank and the seller's bank could be linked to simultaneous delivery, in real-time book-entry transfer systems such as CGO and CMO, of the security from the seller to the buyer. Neither is exposed to the other, for the security or for the cash; and a major source of potential market instability is thereby eliminated.

(c) The Bank of England has established the European Settlements Office (ESO), drawing on the experience gained from the building of the CGO and CMO systems. This is a comparable book-entry transfer and payment system for non-sterling instruments (initially those denominated in ECUs). It provides a same-day real time settlement service for market participants in London, which will assist the development of the ECU repo market which has grown in parallel to the ECU cash market. This system was inaugurated on 31st August 1993.

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Table 1

**Basic statistical data**

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Population (millions): | | | | | |
| *mid-year* ..... | *57.0* | *57.2* | *57.4* | *57.6* | *57.8*[1] |
| GDP (GBP billions)[2] ..... | 471.3 | 515.3 | 550.3 | 573.4 | 594.9 |
| GDP per capita ..... | 8,268 | 9,009 | 9,587 | 9,955 | 10,292 |
| Exchange rate (domestic currency vis-à-vis USD): | | | | | |
| *year-end* ..... | *0.5531* | *0.6202* | *0.5183* | *0.5354* | *0.6601* |
| *average* ..... | *0.5619* | *0.6104* | *0.5598* | *0.5655* | *0.5661* |

[1] Estimated. [2] Nominal at market prices.

Table 2

**Settlement media used by non-banks**

(at year-end, not seasonally adjusted, in billions of pounds sterling)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Notes and coin ..... | 14.4 | 15.4 | 15.2 | 15.7 | 17.0 |
| Narrow money deposits[1] .. | 200.6 | 220.9 | 240.0 | 262.6 | 357.0[1] |
| Narrow money supply ..... | 215.0 | 236.3 | 255.2 | 278.3 | 374.0[1] |
| *Memorandum items:* | | | | | |
| Broad money supply ($M_4$)[1] ..... | 356.4 | 423.4 | 474.3 | 502.1 | 519.4 |
| Broad money deposits | 342.0 | 408.0 | 459.1 | 486.4 | 502.4 |
| *of which held by:* | | | | | |
| *persons* ..... | *243.8* | *284.2* | *317.4* | *340.1* | *354.2* |
| *corporate sector* ..... | *51.4* | *59.8* | *63.9* | *69.8* | *69.3* |
| *other* ..... | *46.7* | *64.0* | *77.7* | *76.5* | *78.9* |

[1] Break in series means that this figure is not comparable with previous figures in the series. The definition of deposits in $M_2$ was altered with effect from December 1992. Previously, bank deposits in $M_2$ comprised all non-interest-bearing deposits plus "chequable" sight or time deposits regardless of maturity plus other deposits (excluding certificates of deposit) of less than £100,000 and with less than one month to maturity; building society deposits included in $M_2$ were "transactions accounts" and other deposits of less than £100,000 and up to one month maturity. Banks now define retail deposits as deposits which arise from the customers' acceptance of an advertised rate (including nil). Building societies include all shares or sums deposited by individuals plus sums from contractual savings schemes (but exclude retail issues of subscribed capital e.g. perpetual interest-bearing shares).

Table 3

**Settlement media used by banks, building societies and discount houses**

(at year-end, not seasonally adjusted, in billions of pounds sterling)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Reserve balances held at central bank | 1.3 | 1.6 | 1.8 | 1.6 | 1.4 |
| Sight and time deposits with other banks, building societies, discount houses | 176.7 | 193.2 | 200.0 | 187.0 | 210.3 |
| *of which:* | | | | | |
| *sight* | *24.0* | *30.7* | *30.5* | *26.8* | *31.6* |
| *time* | *139.7* | *147.8* | *152.4* | *140.2* | *157.2* |
| *residual*[1] | *13.0* | *14.7* | *17.1* | *20.0* | *21.5* |
| *Memorandum items:* | | | | | |
| Required reserves | 0 | 0 | 0 | 0 | 0 |
| Discount houses' borrowing from central bank | 0.03 | 0.01 | 0.04 | 0 | 0 |

[1] In respect of deposits which cannot be split between sight and time (e.g. building society deposits with each other).

Table 4

**Banknotes and coin**

(in millions of pounds sterling)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Total banknotes and coin outstanding[1,2] | 17,867 | 18,820 | 19,369 | 19,868 | 20,450 |
| Denomination of banknotes:[3] | | | | | |
| *50 pounds* | . | . | *2,518* | *2,640* | *2,801* |
| *20 pounds* | . | . | *5,277* | *5,797* | *6,498* |
| *10 pounds* | . | . | *6,426* | *6,323* | *5,856* |
| *5 pounds* | . | . | *1,528* | *1,276* | *1,232* |
| *1 pound* | . | . | *61* | *60* | *58* |
| Banknotes held by credit institutions[1,2,4] | 3,420 | 3,461 | 4,113 | 4,152 | 3,482 |
| Total banknotes outside credit institutions[1,2,4] | 14,447 | 15,359 | 15,256 | 15,716 | 16,968 |

[1] Not seasonally adjusted. [2] Average for the month of December. [3] Bank of England notes only. [4] Figure includes coin.

Table 5

**Institutional framework**

(at end-1992)

| Categories | Number of institutions | Number of branches | Number of accounts (millions) | Value of accounts (GBP billions)[1] |
|---|---|---|---|---|
| Central bank | 1 | 5 | } 78.7[2] | } 169.2[3] |
| Commercial banks | 512 | 13,259[2] | | |
| Building societies | 88 | 5,765 | 41.4 | 187.9 |
| Post Office | 1 | 20,160 | 15.8 | 1.4[4] |
| **Total** | 602 | 39,189 | 135.9 | 358.5 |
| *Memorandum item:* | | | | |
| Branches of foreign banks | 255 | . | . | . |

[1] Figures for the value of accounts with banks and building societies are compatible with the retail element of $M_4$. National Savings Bank (NSB) accounts are not included in $M_4$. [2] Partly estimated. [3] All private sector sterling accounts with UK banks (including the central bank and Girobank). [4] National Savings Ordinary Accounts only. NSB facilities are available at post offices on an agency basis.

Table 6

**Cash dispensers, ATMs and EFTPOS terminals**

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Cash dispensers and ATMs: | | | | | |
| *Number of networks* | *4* | *4* | *3* | *3* | *3* |
| *Number of machines* | *13,980* | *15,740* | *17,000* | *17,780* | *18,280* |
| *Volume of transactions (millions)* | *754* | *883* | *992* | *1,066* | *1,147* |
| *Value of transactions*[1] *(GBP billions)* | *29* | *35* | *43* | *49* | *54* |
| EFTPOS: | | | | | |
| *Number of networks*[2] | *3* | *3* | *3* | *3* | *3* |
| *Number of terminals*[3] | *24,300* | *75,000* | *110,000* | *190,000* | *220,000* |
| *Volume of transactions (millions)* | . | . | . | . | . |
| *Value of transactions (GBP billions)* | . | . | . | . | . |

[1] Includes estimated values of building society transactions. [2] VISA, SWITCH and MasterCard only. [3] Estimated.

Table 7

**Number of payment cards in circulation**[1]

(at year-end, in millions)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Cards with a cash function[2] ..... | 53.2 | 65.4 | 66.9 | 65.8 | 67.9 |
| Cards with a debit/credit function ..... | | | | | |
| *of which:* | | | | | |
| *cards with a debit function* ..... | .[3] | *13.6* | *19.0* | *20.1* | *22.6* |
| *cards with a credit function*[2,4] ..... | *27.2* | *30.1* | *31.4* | *28.4* | *27.9* |
| Cards with a cheque guarantee function[5] ..... | 33.1 | 37.8 | 42.3 | 43.0 | 44.4 |
| Retailer cards[6] ..... | . | . | . | . | 11 |

[1] A card with multiple functions may appear in several categories. It is, therefore, not meaningful to add the figures. [2] Bank cards only (excludes cards issued by building societies). [3] Debit cards were introduced in 1988. [4] Bank VISA and MasterCard and travel and entertainment cards (charge cards) only (excludes cards issued by building societies). [5] Includes eurocheque cards. [6] Estimated.

Table 8

**Payment instructions handled by selected payment systems: volume of transactions**

(in millions)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Large-value systems: | | | | | |
| *Town (paper)*[1] ..... | *3* | *2* | *1* | *0.3* | *0.1* |
| *CHAPS (automated)* ... | *6* | *6* | *8* | *8.0* | *9.0* |
| Cheque and Credit Clearings: | | | | | |
| *cheques*[1,2] ..... | *2,364* | *2,449* | *2,517* | *2,472.0* | *2,395.0* |
| *paper-based credit transfers*[1,2] ..... | *202* | *198* | *191* | *183.0* | *182.0* |
| BACS: | | | | | |
| *credit transfers*[1] ..... | *651* | *707* | *756* | *786.0* | *819.0* |
| *direct debits* ..... | *595* | *709* | *846* | *916.0* | *1,001.0* |
| **Total** ..... | 3,821 | 4,071 | 4,319 | 4,365.3 | 4,406.1 |

[1] Inter-branch items are excluded. [2] Includes Northern Ireland and Scotland.

Table 9

**Payment instructions handled by selected payment systems: value of transactions**

(in billions of pounds sterling)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Large-value systems: | | | | | |
| *Town (paper)*[1] ..... | *7,693* | *6,754* | *4,776* | *2,228* | *1,387* |
| *CHAPS (automated)* ... | *11,289* | *14,733* | *18,880* | *19,050* | *20,928* |
| Cheque and Credit Clearings: | | | | | |
| *cheques*[1,2] ..... | *1,056* | *1,142* | *1,210* | *1,207* | *1,175* |
| *paper-based credit transfers*[1,2] ..... | *112* | *116* | *118* | *113* | *110* |
| BACS: | | | | | |
| *credit transfers*[1] ..... | *269* | *333* | *418* | *484* | *519* |
| *direct debits* ..... | *154* | *193* | *250* | *288* | *284* |
| **Total** ..... | 20,573 | 23,271 | 25,652 | 23,370 | 24,403 |

[1] Inter-branch items are excluded. [2] Includes Northern Ireland and Scotland.

Table 10

**Transfer instructions handled by securities settlement systems: volume of transactions**

(in thousands)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| CGO[1] ..... | . | . | . | 584.0 | 678.2 |
| CMO[2] ..... | . | . | . | 219.1 | 247.6 |

[1] Central Gilts Office. 2 Central Moneymarkets Office; the CMO began operations in October 1990.

Table 11

**Transfer instructions handled by securities settlement systems: value of transactions**

(in billions of pounds sterling)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| CGO[1] ..... | . | . | . | 4,355 | 6,862 |
| CMO[2] ..... | . | . | . | 1,651 | 2,054 |

[1] Central Gilts Office. 2 Central Moneymarkets Office; the CMO began operations in October 1990.

Table 12

**Indicators of use of various cashless payment instruments: volume of transactions**

(in millions)

| Instruments | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Cheques issued:[1,2] | | | | | |
| *large-value (Town)* ..... | *4.0* | *3.0* | *1.0* | *0.4* | *<0.1* |
| *others* ..... | *3,059.0* | *3,143.0* | *3,212.0* | *3,126.0* | *3,005.0* |
| Payments by card: | | | | | |
| *debit* ..... | . | *68.0* | *192.0* | *359.0* | *522.0* |
| *credit*[3] ..... | *597.0* | *651.0* | *693.0* | *690.0* | *715.0* |
| Paper-based credit transfers:[2,4] ..... | 481.0 | 494.0 | 496.0 | 477.0 | 462.0 |
| Paperless credit transfers: | | | | | |
| *large-value (CHAPS)* .. | *6.0* | *6.0* | *8.0* | *8.0* | *9.0* |
| *others*[2] ..... | *727.0* | *782.0* | *832.0* | *861.0* | *892.0* |
| Direct debits ..... | 595 | 709 | 846 | 916.0 | 1,001.0 |
| **Total**[5] ..... | 5,469.0 | 5,856.0 | 6,280.0 | 6,437.0 | 6,606.0 |

[1] Excludes cheques processed at branch level. Includes cheques used to obtain cash. [2] Includes inter-branch items (values are estimated). [3] VISA and MasterCard bank credit cards only. Excludes transactions by holders of charge cards (travel and entertainment cards) and retailer cards. [4] Excludes items processed at branch level. [5] Excludes postal orders and government payments in cash from post offices against state benefit vouchers.

Table 13

**Indicators of use of various cashless payment instruments: value of transactions**

(in billions of pounds sterling)

| Instruments | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Cheques issued:[1,2] | | | | | |
| *large-value (Town)* ..... | *9,867.0* | *9,440.0* | *5,120.0* | *2,420.0* | *1,458.0* |
| *others* ..... | *1,373.0* | *1,469.0* | *1,549.0* | *1,533.0* | *1,483.0* |
| Payments by card: | | | | | |
| *debit* ..... | . | *1.7* | *5.1* | *9.5* | *13.8* |
| *credit*[3] ..... | *20.4* | *23.8* | *27.7* | *29.4* | *31.3* |
| Paper-based credit transfers[2,4] ..... | 578.0 | 629.0 | 677.0 | 652.0 | 621.0 |
| Paperless credit transfers: | | | | | |
| *large-value (CHAPS)* .. | *11,289.0* | *14,733.0* | *18,880.0* | *19,050.0* | *20,928.0* |
| *others*[2] ..... | *286.0* | *352.0* | *441.0* | *512.0* | *542.0* |
| Direct debits ..... | 154.0 | 193.0 | 250.0 | 288.0 | 284.0 |
| **Total**[5] ..... | 23,567.4 | 26,841.5 | 26,949.8 | 24,493.9 | 25,361.1 |

[1] Excludes cheques processed at branch level. Includes cheques used to obtain cash. [2] Includes inter-branch items (values are estimated). [3] VISA and MasterCard bank credit cards only. Excludes transactions by holders of charge cards (travel and entertainment cards) and retailer cards. [4] Excludes items processed at branch level. [5] Excludes postal orders and government payments in cash from post offices against state benefit vouchers.

Table 14

**Participation in S.W.I.F.T. by domestic institutions**[1]

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Members | 47 | 53 | 54 | 54 | 57 |
| *of which: live* | *44* | *48* | *53* | *53* | *56* |
| Sub-members[2] | 181 | 191 | 196 | 204 | 210 |
| *of which: live* | *166* | *183* | *187* | *197* | *197* |
| Participants[3] | 7 | 12 | 22 | 28 | 28 |
| *of which: live* | *4* | *9* | *17* | *18* | *23* |
| Total users | 235 | 256 | 272 | 286 | 295 |
| *of which: live* | *214* | *240* | *257* | *268* | *276* |
| *Memorandum items:* | | | | | |
| Total S.W.I.F.T.: | | | | | |
| *members* | *1,581* | *1,697* | *1,812* | *1,963* | *2,074* |
| *sub-members* | *1,228* | *1,315* | *1,469* | *1,607* | *1,738* |
| *participants* | *27* | *37* | *63* | *78* | *91* |
| *users* | *2,836* | *3,049* | *3,344* | *3,648* | *3,903* |

[1] Data for the United Kingdom and the Isle of Man. [2] Domestic users sponsored by members abroad. [3] Participants are not shareholders in S.W.I.F.T. and their message traffic over the network is restricted.

*Source*: S.W.I.F.T.

Table 15

**S.W.I.F.T. message flows to/from domestic users**[1]

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Total messages sent ..... | 29,905,363 | 35,768,234 | 40,436,615 | 43,171,404 | 48,167,743 |
| *of which:* | | | | | |
| *category I*[2] ..... | *6,176,752* | *6,903,624* | *7,639,886* | *8,106,518* | *8,851,050* |
| *category II*[3] ..... | *11,118,051* | *12,995,940* | *14,036,209* | *14,799,002* | *16,109,002* |
| *of which:* | | | | | |
| *sent/received to/from domestic users* ..... | *6,624,661* | *8,091,519* | *9,495,324* | *10,058,121* | *11,538,743* |
| Total messages received ..... | 26,672,115 | 31,430,355 | 35,495,611 | 37,850,280 | 42,182,121 |
| *of which:* | | | | | |
| *category I*[2] ..... | . | . | . | . | *10,212,447* |
| *category II*[3] ..... | . | . | . | . | *7,863,519* |
| *Memorandum item:* | | | | | |
| Global S.W.I.F.T. traffic .. | 255,142,610 | 298,780,982 | 332,895,932 | 365,159,291 | 405,540,962 |

[1] Data for the United Kingdom and the Isle of Man. [2] Category I: customer (funds) transfers. [3] Category II: bank (funds) transfers.

*Source*: S.W.I.F.T.

**Methodology and sources used for the compilation of Tables 12 and 13**

Sources for the statistics included in Tables 12 and 13 are documents published by the Association for Payment Clearing Services (APACS) and the British Bankers' Association (BBA). Data in respect of cross-border, foreign exchange and securities transactions are included indistinguishably. Excluded, however, are government payments in cash from post offices against state benefit vouchers as well as postal orders.

**Cheques:**

- Split between large-value same-day Town Clearing and the cheques processed through the three-day Cheque Clearing.
- Excludes cheques processed at branch level (a proportion of which will have been used to obtain cash) - see Footnote 1.
- Includes some cheques used to obtain cash - see Footnote 1.
- Non-Town Cheques (including eurocheques) written abroad and drawn on UK banks are included in the Cheque Clearing data.
- Includes inter-branch items, i.e. items exchanged between branches of the same bank. The value of inter-branch cheques is estimated.
- Some maturing commercial bills are processed in the Town Clearing and included in the data.
- Travellers' cheques are included in the non-Town Cheque Clearing data.

**Credit cards:**

- VISA and MasterCard bank credit cards only. Excludes retailer card and travel and entertainment card transactions.
- Includes cash advances.
- Includes data on transactions carried out abroad with UK-issued cards (no breakdown between domestic and cross-border transactions is available).
- Excludes data on foreign-issued cards used in the United Kingdom.

**Debit cards:**

- Many debit cards have more than one function; transaction data are for the debit card function only.
- Includes debit card transactions at EFTPOS indistinguishably.

**Paper-based credit transfers:**

- Items processed through the three-day Credit Clearing.
- Excludes credits processed at branch level.
- Includes inter-branch items. The value of inter-branch items is estimated.
- Includes transactions involving the payment of cash into accounts.

**Paperless credit transfers:**

- Split between large-value (CHAPS) and "others" (standing orders and other credits processed via BACS, and inter-branch electronic credits).
- The value of inter-branch electronic credits is estimated.
- CHAPS data exclude inter-branch items.

**Direct debits:**

- Items processed via BACS' Direct Debiting Scheme (debit on the debtor's bank account initiated by the creditor, based on the prior written agreement of the debtor).
- Does not include transactions originating from ATM withdrawals.

# PAYMENT SYSTEMS IN THE UNITED STATES

# Table of contents

## INTRODUCTION

The development of the payment system in the United States has been influenced by many diverse factors. Firstly, there are numerous financial intermediaries that provide payment, clearing, and settlement services. Over 27,000 deposit-taking institutions offer some type of payment service. Other privately operated payment systems range from the numerous localised interbank associations that clear cheques for their members or operate automated teller machine (ATM) or point-of-sale (POS) networks to the nationwide credit card networks and a major "large-value" electronic funds transfer system. In addition, the central bank plays a significant role in the payment system through the provision of a wide range of interbank payment services.

Secondly, the legal framework governing payment activity as well as the regulatory structure for financial institutions that provide payment services in the United States is complex. Financial institutions are chartered at either the state or federal level, and are supervised by one or more agencies at the state or federal level, or both.

Thirdly, a variety of payment instruments and settlement mechanisms are available to discharge payment obligations between and among financial institutions and their customers. These payment instruments vary considerably in their characteristics, such as cost, technology, convenience, funds availability and finality, as well as in orientation towards consumer, commercial, and interbank transactions. The large-value electronic funds transfer mechanisms are used to discharge the bulk of the dollar value of all payments in the United States. By contrast, the majority, by volume, of all payments in the United States, particularly those involving retail transactions, continues to be settled through the use of cash or paper-based instruments, particularly cheques. The use of electronic payment mechanisms, such as automated clearing house (ACH) and ATM and POS networks, however, continues to grow. In addition, innovation and competition have led to the use of new instruments and systems that rely increasingly on electronic payment mechanisms.

The size and complexity of financial markets in the United States have created significant payment and settlement interdependencies involving the banking system, money and capital markets, and associated derivative markets. Market participants and the Federal Reserve have pursued measures to strengthen major US payment mechanisms, to increase processing efficiency, and to reduce payment system risks.

## 1. INSTITUTIONAL ASPECTS

### 1.1 General legal framework

State and federal statutes, regulations, and case law govern the payment system in the United States. The relevant legal principles generally depend on the method of payment (electronic or paper-based) and in some cases the status of parties to a payment, for example, consumer, merchant, or financial institution.

Several federal laws, which are discussed further below, apply to payment activities, particularly in the consumer sector. At the state level, the Uniform Commercial Code (UCC) establishes a set of model state statutes governing certain commercial and financial activities, including some banking and securities market transactions. These model laws have been adopted, with some modifications, by nearly all of the states. Articles of the UCC pertinent to payment and settlement activities are the following: Article 3 (negotiable instruments), Article 4 (bank deposits

and collections), Article 4A (funds transfers, including wholesale ACH credit transfers), and Article 8 (investment securities).[1]

In addition, the rules and membership agreements of private clearing and settlement arrangements provide a contractual framework for payment activity within the relevant governing law. For payment services that the Federal Reserve operates, Federal Reserve regulations and operating circulars specify certain terms and conditions under which the service is provided.

### *1.1.1 Cheques*

Articles 3 and 4 of the UCC together form the legal basis of paper-based cheque transactions in the United States. In addition, Congress passed the Expedited Funds Availability Act of 1987 (EFAA), which granted the Federal Reserve broad authority to make improvements in the cheque collection and return system in the United States. In accordance with the EFAA, the Federal Reserve issued Regulation CC, which includes a number of provisions designed to improve and accelerate the collection and return of cheques among deposit-taking institutions. In addition to Regulation CC, cheques collected through the Federal Reserve are governed by Sub-part A of the Federal Reserve's Regulation J, which provides rules for collecting and returning items through the Federal Reserve.

### *1.1.2 Consumer electronic payments*

The rights and liabilities of both consumers and financial institutions involved in consumer electronic payment transactions, including funds transfers through the ACH, ATM, or POS networks, are governed primarily by the Electronic Funds Transfer Act of 1978 (EFTA) and the Federal Reserve's Regulation E. Regulation E also sets standards for financial disclosure, card issuance, access, and error resolution procedures applicable to all financial institutions. Other federal laws and policies affecting consumer usage of electronic funds transfers include the Comptroller of the Currency's Consumer Protection Guidelines, as well as the Truth-in-Lending Act (and the Federal Reserve's Regulation Z issued thereunder), which prescribes disclosure of costs and terms of consumer credit.

### *1.1.3 Fedwire and CHIPS*

Payment transactions over the Fedwire funds transfer system are governed by the Federal Reserve's Regulation J, which incorporates the requirements of Article 4A of the UCC. Regulation J, in particular Sub-part B, defines the rights and responsibilities of financial institutions that use the Fedwire system, as well as the rights and responsibilities of the Federal Reserve. In addition, Fedwire operating circulars cover items such as operating hours, security, authentication, fees, and certain restrictions.

Funds transfers made through the Clearing House Interbank Payments System (CHIPS) are subject to the New York Clearing House Association's constitution and CHIPS rules and procedures.[2] The CHIPS rules stipulate that the laws of the state of New York, which include Article 4A of the UCC, apply to CHIPS transactions.

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1 Article 4A does not address transactions that are governed by the Electronic Funds Transfer Act (primarily consumer electronic funds transfers). In addition, an effort is currently underway to complete a revision of Article 8, particularly as it relates to transactions in book-entry securities.

2 In addition, the Federal Deposit Insurance Corporation Improvement Act of 1991 (FDICIA), which legally validates bilateral and multilateral netting contracts between or among certain federally regulated and other financial institutions, applies to the netting of payments made through CHIPS. (See Section 3.3 for a further discussion of the FDICIA netting provision.)

## 1.2 Financial intermediaries that provide payment services

Financial intermediaries that provide payment services in the United States include more than 27,000 deposit-taking institutions.[3] These institutions can be classified as commercial banks, as thrift institutions, such as savings and loan associations, or as credit unions.

Despite the large number of deposit-taking institutions, the banking system in the United States is actually somewhat concentrated. As of 31st December 1992, commercial banks accounted for approximately 76% of the total assets held by deposit-taking institutions in the United States, with the remainder held by thrift institutions. Over half of commercial banking assets are held by 107 banks with assets in excess of US$ 5 billion, while 20% of total commercial bank assets reside in more than 10,000 banks with assets of less than US$ 300 million.

### *1.2.1 Commercial banks*

Commercial banks accept demand and time deposits, make commercial loans, and provide other banking services, including payment services, to the public. At the end of 1992, there were approximately 11,400 commercial banks in the United States. Assets of commercial banks amounted to approximately US$ 3.6 trillion.

Commercial banks may be chartered by state or federal authorities, and are supervised and regulated by either state or federal supervisors, or, in some cases, by both. Federal supervisors include the Office of the Comptroller of the Currency of the US Treasury, the Federal Reserve, and the Federal Deposit Insurance Corporation (FDIC). Generally, commercial bank deposits are insured by the Bank Insurance Fund administered by the FDIC. Banks pay risk-based deposit insurance premiums on uninsured as well as insured deposits.[4] Commercial banks, like other deposit-taking institutions, are subject to reserve requirements established by the Federal Reserve.

In addition, all banks must conform to state laws that dictate their geographic operating boundaries. A few states, known as unit banking states, restrict banks to operating within limited geographic areas. The majority of states, however, permit banks to operate branch offices throughout the state. The Bank Holding Company Act of 1956 prohibits a bank holding company from acquiring a bank outside its home state, unless the state where the bank is located specifically authorises such acquisitions. By 1992, virtually all of the states had enacted laws to permit entry by out-of-state bank holding companies through the ownership of separately chartered banks.

### *1.2.2 Thrift institutions and credit unions*

Thrift institutions include savings and loan associations and other savings institutions, such as federal mutual savings banks. At the end of 1992, there were about 2,500 savings and loan associations and other savings institutions. Assets of thrift institutions that were insured and regulated by the US Government were approximately US$ 850 billion. Credit unions numbered approximately 13,000 and had assets of US$ 258 billion at the end of 1992.

Savings and loan associations (S&Ls) accept savings and time deposits and make loans. S&Ls are federally or state-chartered and are required by law to make a certain percentage of their loans (approximately 70%) as home mortgages. They may be organised and owned by depositors, in which case they are called mutual associations, or they may be organised as stock-issuing corporations owned by shareholders. Legislation in 1980 and 1982 expanded the powers of S&Ls to

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3 The term "depository institution," which is defined in Section 19(b)(1)(A) of the Federal Reserve Act, is more commonly used in the United States to refer to a deposit-taking financial institution, or one that accepts deposits.

4 If an insured bank is closed, deposits up to and including US$ 100,000 per account are generally covered by the FDIC.

include making consumer loans, offering negotiable order of withdrawal (NOW) accounts, issuing credit cards, and offering certain types of commercial loans.[5] Federally chartered and some state-chartered S&Ls are insured by the Savings Association Insurance Fund (SAIF), which is administered by the FDIC. S&Ls are supervised and regulated by the Office of Thrift Supervision (OTS) within the US Treasury.

Other savings institutions, such as federal savings banks, mutual savings banks, and mutual stock banks, accept consumer deposits and invest primarily in residential mortgages and high-grade investment securities. As in the case of S&Ls, these organisations may be owned by their depositors, in which case they are known as mutual savings banks, or they may be stock-issuing corporations owned by shareholders. Legislation in 1980 and 1982 gave these institutions the ability to offer NOW accounts and credit cards, to make commercial and consumer loans (up to 10% and 30% of assets, respectively), to offer discount brokerage services, and to invest in real estate without limitation. These institutions are also supervised by the OTS.

Credit unions (state and federal) are cooperative organisations of individuals sharing a common affiliation, usually through employment with a particular company or organisation, or membership in a labour union or church. In 1984, credit-union membership criteria were greatly relaxed, allowing credit unions to solicit more members.

Since the late 1970s, credit unions have been permitted to offer many of the same services as commercial banks. Credit unions accept deposits of members' savings in the form of share purchases and pay interest, in the form of dividends on the shares, out of earnings. Credit unions also provide loans to members and provide transaction accounts upon which share drafts can be drawn, much like NOW accounts.[6] Federally chartered credit unions may provide and hold residential mortgages and issue credit cards.

The National Credit Union Administration (NCUA), an independent federal agency chartered in 1970, is the primary supervisor of federally chartered credit unions. The NCUA provides a central liquidity facility and also administers the National Share Insurance Fund, which provides deposit insurance for federal credit unions and many state credit unions.

### *1.2.3 Other institutions that provide payment services*

Other organisations involved in providing payment services to the public include so-called "nonbank banks" and bank card companies. In addition, the US Postal Service provides payment services by selling postal money orders, which can be used to make payments. Nonbank banks (or limited-service banks) can make loans or accept deposits, but cannot do both. Because of this distinction, a nonbank bank avoids meeting the legal definition of a bank as defined by the Bank Holding Company Act of 1956. This "loophole" was closed in August 1987 with the passage of the Competitive Equality Banking Act; nonbank banks in existence prior to 1987 were permitted to continue to operate under certain restrictions.

Bank card companies license credit and debit card trademarks to financial institutions, authorise transactions, and provide certain clearing and settlement services for transactions between banks. Visa and MasterCard may be the most well known bank card networks in the United States, but other bank card networks, such as those using ATM and POS technology, are common throughout the United States. Other card-issuing companies include national "travel and entertainment" card issuers and a number of major retailers that issue cards to their customers.

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5 NOW accounts are interest-bearing accounts that permit withdrawals by cheque.

6 A share draft is a cheque-like negotiable instrument issued by a credit union that draws funds from the issuer's account and is typically payable through a designated bank. Share drafts typically are cleared through a commercial correspondent bank.

## 1.3 The role of the central bank

The Federal Reserve Act of 1913 established the Federal Reserve as the central bank of the United States and prescribed the general banking powers of the Federal Reserve. The Federal Reserve has responsibilities that encompass note issuance, payment services, banking supervision, and monetary policy. The Federal Reserve System includes the 12 regional Federal Reserve Banks located throughout the United States, and the Board of Governors, located in Washington, D.C. The Board of Governors is responsible for the general supervision and oversight of the Federal Reserve Banks, which are separately incorporated entities.

### *1.3.1 Note issuance*

Virtually all US dollar paper currency, or notes, in circulation is in the form of Federal Reserve notes. Notes are designed and produced by the US Treasury Department's Bureau of Engraving and Printing and are delivered to the Federal Reserve Banks for circulation. The Federal Reserve System pays the Treasury for the cost of printing the notes.

The 12 Federal Reserve Banks are each authorised under the Federal Reserve Act to issue Federal Reserve notes to the public. Federal Reserve notes are fully secured by legally authorised collateral, principally US government securities held by the Federal Reserve, before being issued by the Federal Reserve Banks.

### *1.3.2 Payment services*

The Federal Reserve Banks, their 25 branches, and 11 specialised (primarily cheque) processing facilities compose the operational sites of the Federal Reserve. They provide a variety of payment and other services to deposit-taking institutions. Federal Reserve payment services include the distribution of currency and coin, the collection and return of cheques, the electronic transfer of funds and securities including the processing of ACH payments, and the provision of net settlement services. Individuals and institutions that do not take deposits are not generally permitted direct access to Federal Reserve payment services, although these entities may utilise these services indirectly as customers of deposit-taking institutions.

The Federal Reserve also acts as the fiscal agent for the US government. As such, the Federal Reserve holds certain US Treasury deposits, pays government cheques, processes government ACH payments and funds transfers, issues and redeems US Treasury securities, and performs other financial services for the government as directed by the Treasury.

### *1.3.3 Supervision and regulation*

As described in Section 1.2, a number of governmental bodies share the responsibility for supervising and regulating deposit-taking institutions in the United States. The Federal Reserve is the primary supervisor and regulator of all US bank holding companies and of state-chartered commercial banks that are members of the Federal Reserve System.[7] The Federal Reserve is also responsible for the supervision of Edge Act and agreement corporations as well as the operations of foreign banking companies in the United States.[8] Legislation enacted in 1991 gave the Federal

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7 All federally chartered banks are members of the Federal Reserve System. A state-chartered bank may become a member of the Federal Reserve System by applying to the Federal Reserve and subscribing to the capital stock of the Reserve Bank of its District

8 Edge Act and agreement corporations are specially chartered corporations that are typically subsidiaries of US banks. Under Section 25 and 25(a) of the Federal Reserve Act, Edge Act and agreement corporations are permitted to engage in international banking and investment activities.

Reserve a substantially increased role in the supervision and regulation of the US activities of foreign banks. To ensure the safety and soundness of the banking organisations that it supervises, the Federal Reserve conducts surveillance and on-site examinations and undertakes enforcement and other supervisory actions.

The Federal Reserve's regulatory responsibilities include the administration of laws governing the acquisition of banks, the non-banking activities of bank holding companies that are closely related to banking, mergers of both banks and bank holding companies, and certain other changes in control. The Federal Reserve also is responsible for issuing regulations to implement a number of statutes designed to ensure that consumers, including bank customers, have sufficient information and are treated fairly in credit and other financial transactions.

#### *1.3.4 Monetary policy*

The Federal Reserve, through the Federal Open Market Committee (FOMC), is responsible for formulating and implementing monetary policy.[9] Monetary policy instruments include open market operations, the discount rate, and reserve requirements for deposit-taking institutions.[10] (See Section 5.3 for a discussion of monetary policy implementation and the payment system.)

### 1.4 The role of other private and public sector bodies

Other entities that play a role in the US payment system include those that provide specialised payment and settlement services and those that perform standard-setting or rule-writing functions. In 1992, private organisations providing payment and settlement services in the United States included the following: the clearing house association that operates CHIPS, approximately 140 local cheque clearing houses and one national cheque clearing house, 73 ATM networks, two regional and one national ACH networks, twelve securities clearing organisations, and nine futures clearing houses.

In the standards arena, the National Automated Clearing House Association (NACHA) formulates and promulgates rules and standards for processing ACH transactions throughout the United States. In addition, 38 regional ACH associations provide educational and promotional services to ACH participants.

The American Bankers Association (ABA) administers the system of routing numbers that are encoded on cheques and identify the bank responsible for payment of the cheque. These nine-digit routing numbers are now used for a variety of purposes, including identification of parties to electronic payments such as ACH and Fedwire transfers. The Committee on Uniform Securities Identification Practices (CUSIP) designed a numbering system for securities under auspices of the ABA. The CUSIP system is administered by Standard and Poors, under the oversight of the ABA.[11]

Another standard-setting body relevant to payment services is the American National Standards Institute (ANSI). ANSI is a non-profit organisation that sponsors industry standards, including standards for financial communications and transaction processing. The United

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9 The FOMC comprises the seven members of the Board of Governors, the president of the Federal Reserve Bank of New York, and four other Reserve Bank presidents. The presidents of the Reserve Banks located outside of New York alternate as voting members of the FOMC.

10 The discount rate is the interest rate charged to deposit-taking institutions on overnight or interday borrowings from the Federal Reserve.

11 In addition, two international securities numbering systems are used in the United States: the CUSIP International Numbering System (CINS), administered by Standard and Poors, and the International Securities Identification Numbering (ISIN) system of the International Standards Organisation.

Nations/Electronic Data Interchange (UN/EDIFACT) for Administration, Commerce, and Transfer administers the international standards for Electronic Data Interchange (EDI).

## 2. PAYMENT MEDIA USED BY NON-FINANCIAL ENTITIES

### 2.1 Cash

Cash (currency and coin) is a widely used payment medium for many types of transactions in the United States, particularly small-value transactions. The most commonly used forms of legal tender in the United States include coin, which is issued by the US Treasury, and Federal Reserve notes, issued by the Federal Reserve. Coins are minted in denominations of 1, 5, 10, 25, and 50 cents; Federal Reserve notes are issued in denominations of US$ 1, US$ 5, US$ 10, US$ 20, US$ 50, and US$ 100.[12]

At the end of 1992, the value of currency and coin in circulation was about US$ 300 billion, of which US$ 280 billion was currency. The total number of cash transactions per year in the United States cannot be determined with any reasonable degree of confidence. US currency is also widely used for transactions outside the United States.

### 2.2 Non-cash payment media and instruments

#### *2.2.1 Payment media*

In the United States, the money balances used by consumers and non-financial businesses to effect transactions are generally held as transaction deposits at deposit-taking institutions. These typically take the form of demand deposits, such as chequing accounts, negotiable order of withdrawal (NOW) accounts, and credit union share draft accounts. At the end of 1992, demand deposits and other checkable deposits amounted to US$ 743 billion.

Other monetary balances that are less liquid but may nonetheless be used to fund payment activity include savings accounts, money market deposit accounts, certain small and large time deposits, money market mutual funds, and liquid investment assets, such as repurchase agreements and Euro-dollar deposits. Certain of these accounts, such as money market deposit accounts and mutual funds, may permit withdrawals of funds by cheque, usually in minimum dollar amounts and in limited numbers. Savings deposits and money market deposit accounts at commercial banks and thrifts amounted to about US$ 1.2 trillion, while small and large time deposits were US$ 871 billion and US$ 363 billion, respectively, at the end of 1992.[13] Money market mutual funds amounted to US$ 536 billion and repurchase agreements and Euro-dollar deposits totalled approximately US$ 200 billion at the end of 1992.

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12 The US$ 1 coin and the US$ 2 note are no longer being produced, although they are still in circulation.

13 Small time deposits are issued in amounts under US$ 100,000. Large time deposits, which do not include Eurodollar deposits, are issued in amounts of US$ 100,000 or more.

### *2.2.2 Payment instruments*

#### *(a) Paper cheques*

The paper cheque is the most frequently used non-cash payment instrument in the United States. The majority of cheques are written by individuals, although businesses also write a significant portion. Cheques are predominately used to pay for consumer purchases of goods and services from businesses. Estimates suggest that only about one-quarter of cheques are used to make payments to individuals or governmental entities.

Private sector efforts to shift cheque payments to electronic media, such as the ACH, have been only marginally successful, although it appears that the annual rate of increase in cheque volume has decreased in recent years. Cash withdrawals from ATMs, direct debits at retail establishments, and wider use of credit cards have no doubt curtailed the growth of cheques, but in many cases such mechanisms are used as a substitute for cash rather than for cheques. Cheque truncation, which eliminates the physical handling of cheques, has, to date, gained only limited acceptance in the United States.

#### *(b) ACH debits and credits*

ACH transactions are a common form of electronic funds transfer used as a payment instrument primarily for recurring payments initiated by businesses and governments. ACH payments offer more certainty in the timing of payments and more convenience to consumers, and provide a greater level of security than payment by cheque. The use of ACH transactions has grown steadily over the last five years; growth in the volume of transactions has averaged approximately 20% per year, and in value terms, ACH usage has increased by nearly 30% per year.

ACH payments may be either credit or debit transactions. In an ACH credit transaction, funds flow from the originator to receiver, and in a debit transaction, funds flow from the receiver to the originator. ACH credit payments include direct deposit of payrolls, government benefit payments, and corporate payments to contractors and vendors. Debit payments include mortgage and loan payments, insurance premiums, consumer bill payments, and corporate cash concentration transactions.[14]

#### *(c) Funds transfers over Fedwire and CHIPS*

The Federal Reserve's funds transfer system (Fedwire) and CHIPS are electronic credit transfer systems that are generally considered large-value payment systems used by financial institutions. These systems are also accessible indirectly to individuals and non-financial businesses through deposit-taking institutions. Third-party funds transfers are permitted over both Fedwire and CHIPS, which do not require a minimum dollar transfer size. A 1986 survey indicated that about 65% of Fedwire dollar volume and 25% of CHIPS dollar volume was attributable to third-party transfers. (These systems are described in further detail in Section 3.2.)

#### *(d) Bank cards*

Bank cards provide a convenient method for purchasing retail goods and services and receiving cash through automated teller machines. Bank cards may be credit cards, debit cards, or combine features of both. Bank credit cards are generally issued by a bank under license from a national organisation, such as Visa or MasterCard. ATM or POS cards are typically proprietary bank-

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14 Corporate cash concentration transactions are generally those initiated by an organisation to fund, or to consolidate funds from, its branches, franchises, or agents.

issued cards. National cards are designed specifically for retail transactions, while many bank-issued cards were initially designed as ATM access cards. Many of these cards were later adapted for general purpose retail transactions at the point of sale.

In addition to bank-issued cards, a number of other companies offer credit cards. These include national travel and entertainment cards, such as American Express and Diners Club, as well as charge cards issued by major US retailers, such as Sears, to their customers in most cases for "in-store" usage.

A 1992 survey of consumers found that 63% of US families had at least one bank-issued credit card, up from only 16% in 1970.[15] In 1992, credit card transactions were estimated to account for approximately 15% of all non-cash payments in the United States.[16]

Debit cards draw funds from the card-holder's transaction account (for instance, a chequing account) at the issuing bank. In some cases, debit cards allow access to home-banking and bill-paying services. In 1992, there were about 150 million debit cards in circulation in the United States.

## 2.3 Recent developments

### *2.3.1 Electronic Data Interchange (EDI)*

EDI is used in the United States by businesses and governments to exchange trade-related documents, such as purchase orders and invoices in a standard format, over public data transmission networks. Most companies use a value-added network (VAN) to transmit payment-related information to other EDI participants. In addition, many companies using EDI include payment instructions with the transmission of the payment-related information. In these cases, deposit-taking institutions act as intermediaries and use the ACH or Fedwire to effect the transfer of funds. In the United States, ANSI X12 formats are generally used to exchange information among companies doing business domestically, and the EDIFACT standard is used for cross-border EDI transactions. ANSI standards will be aligned with EDIFACT standards in 1997.

Although the practice of sending payment instructions with the payment-related information is becoming more common in the United States, only about 4,500 companies, out of approximately 31,000 registered EDI users, use financial EDI. Between 400 and 500 deposit-taking institutions currently provide financial EDI services to corporations. In 1992, approximately 13.5 million financial EDI transactions were sent using the ACH in the United States, including 3.6 million US government transactions. The volume of EDI transactions is estimated to be growing at a rate of approximately 20% per year.[17]

### *2.3.2 Electronic Benefit Transfer (EBT)*

US government agencies are increasingly relying on the electronic delivery of benefit payments in order to increase the efficiency and minimise the cost of disbursing funds and to improve service to recipients. In the past, such efforts have focused on the direct deposit of benefit payments to recipients' accounts at deposit-taking institutions via the ACH mechanism.

Because some recipients do not have an account at a deposit-taking institution, federal and state government agencies are exploring alternative payment programs through EBT. EBT

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15 Source: Federal Reserve, 1992 Survey of Consumer Finances.

16 Consolidated billing statements for credit cards are generally paid by cheque.

17 Source: National Automated Clearing House Association.

systems typically use ATM networks to allow recipients to access cash benefits from accounts established by the government at designated deposit-taking institutions. EBT systems may also use POS networks to allow recipients to access non-cash benefits at retail establishments, such as grocery stores. Recipients typically access their benefits using a magnetic-stripe card. Currently, EBT programs are being operated or tested in several states.

Each day, EBT transactions between the recipient and the benefit provider are settled through the respective ATM or POS network. A deposit-taking institution acting as fiscal agent for the government benefit provider generally maintains an account for settlement by the benefit provider, which may be funded monthly, based on the projected value of benefit obligations, or daily, based on the actual value of benefits disbursed.

### 2.3.3 Prepaid cards

Prepaid cards are a recent addition to the range of payment instruments in the United States which, to date, represent a very small portion of total payment volume. There are several types of prepaid cards being tested or in use in the United States. Most prepaid card mechanisms are used in public transportation systems, telephone services, or other industries that rely on small-value, repeated purchases of a standardised service. A limited number of prepaid cards allow multiple-purpose payments. Cards containing a memory-saving micro chip (smart cards) have not become prevalent in the United States, although two state governments have recently begun using smart cards in their EBT programs.

### 2.3.4 Home banking

Home banking using telephones, computers, or other communication devices has not yet become established as a common means of making payments in the United States. Several regional telephone companies are, however, marketing terminals to their residential customers that make available services such as telephone shopping, bill payments, balance inquiries, or funds transfers. In addition, private companies are exploring new technology, such as cable television networks, that may provide a more cost-effective method for consumers to access home-banking services.

## 3. INTERBANK EXCHANGE AND SETTLEMENT CIRCUITS

### 3.1 General overview

In the United States, interbank payments are processed and settled primarily through the following mechanisms: (1) cheque clearing, (2) ACH, (3) bank card networks, and (4) same-day electronic funds transfer systems (Fedwire and CHIPS). Using these mechanisms, banks exchange payments directly with each other, through private sector clearing houses, through correspondents, or through the Federal Reserve.

#### *3.1.1 Cheque clearing networks*

Nearly 60 billion cheques were written in the United States during 1992. Approximately 30% of those cheques were deposited in the same institution on which they were drawn ("on-us cheques") and, therefore, were settled via accounting entries on the books of the paying institution. The remaining cheques were cleared through interbank mechanisms. About half of these cheques

were cleared through local and national cheque clearing houses and correspondent bank networks; the other half was cleared through the Federal Reserve Banks.

### *(a) Operation of the cheque collection mechanism*

Typically, deposit-taking institutions located in the same geographic area exchange cheques directly or participate in local cheque clearing arrangements. In 1992, there were approximately 140 local cheque-clearing houses in which deposit-taking institutions exchanged cheques and used the net settlement services of the Federal Reserve Banks to settle the net positions of participants.

In addition, one privately operated national cheque-clearing arrangement began operating in 1992. An agent for the members of this clearing arrangement receives information about the value of cheques exchanged each day and calculates each member's net position. The settlement data are transmitted to participants, who use Fedwire funds transfers to settle their net positions through a special settlement account maintained at the Federal Reserve Bank of Cleveland. (See Section 5.2 for a description of the Federal Reserve's net settlement service.)

Cheques drawn on deposit-taking institutions located outside the geographic area in which the collecting deposit-taking institutions are located may be deposited by the collecting institution with correspondent banks or Federal Reserve Banks. Correspondent banks that have established relationships with other correspondent banks present cheques drawn on each other directly. Smaller institutions often use the cheque collection services of correspondent banks or those offered by the Federal Reserve. It is estimated that approximately 85% of cheques deposited for collection with a deposit-taking institution are cleared overnight. Cheques cleared by the Federal Reserve and correspondent banks are processed on high-speed equipment that itemises, records, and sorts cheques based on information contained in the magnetic ink character recognition (MICR) line printed along the bottom of cheques.

Cheques are transported between collecting institutions in a variety of ways. Cheques cleared locally are usually transported by ground couriers, while cheques drawn in regions distant from the deposit-taking institution are generally delivered via air transportation. The Federal Reserve manages an extensive air transportation network to exchange cheques among its 47 cheque-processing facilities and uses local courier networks to deliver cheques to paying institutions.

Correspondent banks settle for the cheques they collect for other institutions through accounts on their books. The Federal Reserve settles for the cheques it collects through the reserve or clearing accounts it maintains for deposit-taking institutions.

### *(b) Pricing policies*

Typically, cheque-clearing houses are non-profit, cooperative organisations that assess their members the actual costs of operating the clearing house. Correspondent banks charge for their services in a variety of ways, and there is little public information available concerning the fees assessed for their collection services.

Federal Reserve fees for cheque collection are based on the Federal Reserve's general pricing principles (see Section 5.2). Fees for cheque collection services vary based on the time of deposit and the amount of sorting performed by the depositing institution. On a volume-weighted basis, Federal Reserve per-item fees in 1993 averaged approximately US$ 0.022 per cheque.

### *3.1.2 Automated Clearing House*

The ACH is a fully electronic batch-processing system through which value-dated payments are processed. Typically, ACH transactions are deposited with an ACH processor one to two days before the settlement date. The Federal Reserve and Visa USA provide national ACH processing services. In addition, the New York Automated Clearing House (NYACH) and Deluxe Data Systems provide ACH processing service to deposit-taking institutions in the states of New York and Arizona, respectively.

In 1992, nearly 2.0 billion ACH transactions with a value of US$ 9 trillion were processed in the United States. About 30% of these payments were initiated by the federal government, which has been a leader in converting payments to electronic form. The Federal Reserve processed approximately 95% of all ACH transactions.

#### *(a) Operation of ACH system*

The Federal Reserve's ACH service is virtually a 24-hour operation divided into four processing cycles. Deposit-taking institutions deposit files of transactions at Federal Reserve Banks during each cycle according to published deposit schedules. ACH transactions are settled through institutions' accounts at their local Federal Reserve Bank on the settlement date indicated in the transaction, and funds are made available to deposit-taking institutions for use on the settlement day. The Federal Reserve, however, retains the right to reverse credits given to receivers of ACH credit transactions until the Reserve Banks' books have been closed for the day, which generally occurs during the night of the settlement day. In the case of credits given to originators of ACH debit transactions, the Reserve Banks may reverse the credits until the opening of business on the banking day following the settlement day.

Deposit-taking institutions generally deposit ACH transactions with their local Federal Reserve Bank. The transactions may be destined for institutions located in the same Federal Reserve territory or in another territory. Once the transactions are processed, the Reserve Banks deliver them electronically to local institutions or transmit them over the Federal Reserve's inter-district communications network to the Federal Reserve Bank serving the receiving deposit-taking institution.[18] The receiving Reserve Bank then transmits the transactions to institutions within its district.

All deposit-taking institutions and service bureaus that directly originate and receive commercial ACH transactions through the Federal Reserve are electronically connected to a Federal Reserve Bank. At the end of 1992, there were more than 6,200 receiving points. Approximately 1,200 institutions that receive only government ACH transactions must be connected electronically to a Reserve Bank by 1st July, 1994. About 200 institutions that originate and receive large volumes of ACH activity are connected to the Federal Reserve by dedicated leased lines. The remaining institutions use shared leased lines or dial-up lines to connect personal computers to the Federal Reserve.

Private sector processors exchange transactions among their members and use the Federal Reserve's ACH service to deliver transactions to non-members. The ACH transactions processed by the Federal Reserve are settled through deposit-taking institutions' accounts at the Federal Reserve. The transactions exchanged among the members of privately operated automated clearing houses are settled through the Federal Reserve's net settlement service.

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18 The Federal Reserve's inter-district communications system is an ANSI X.25 packet switching system that routes messages via communication nodes at each Reserve Bank. Each Reserve Bank has multiple communications paths to every other Reserve Bank, and these paths can be dynamically changed to provide system availability in the event of an operational failure.

### *(b) Pricing policies*

Private sector ACH processors assess their members a variety of fees, including transaction fees, access fees, and fees for non-automated services. For example, Visa USA charges US$ 0.095 to originate or receive a transaction, as well as monthly access fees that vary by type of electronic connection. For transactions sent to or received from the Federal Reserve, users of Visa's service are assessed a surcharge of US$ 0.005. The NYACH assesses a fee of US$ 0.007 to originate or receive a local transaction and US$ 0.014 to originate or receive an interregional transaction. The NYACH also assesses a monthly membership fee of US$ 25 and various fees for non-automated services and training.

In 1993, the Federal Reserve assessed the following fees to institutions using its ACH services: monthly electronic connection fees, which vary based on the type of connection (see also Section 3.2.1); a US$ 10 monthly participation fee; a fee of US$ 1.50 for each file deposited; and a fee of US$ 0.01 for each local transaction and US$ 0.015 for each interregional transaction originated or received. A variety of other fees are also assessed for other non-routine and non-automated services.

## *3.1.3 Credit card, ATM, and POS networks*

Credit card, ATM, and POS networks provide communications, transaction authorisation, and interbank financial settlement for their member financial institutions. The networks are typically owned by a group of financial institutions that provide initial capital and establish uniform operating policies, procedures, and controls. Operating expenses are recovered through transaction fees. Most networks rely on interday interbank credit, borrowing facilities and provisions for special assessments on members to provide for settlement liquidity.

The largest credit card networks in the United States are Visa and MasterCard. ATM and POS networks in the United States number approximately 100, although significant consolidation is occurring among existing networks; the 20 largest ATM networks are estimated to process 89% of all ATM transactions in the United States.[19]

Interbank settlement of credit card, ATM, or POS transactions between the card-issuing bank and the retail merchant's bank occurs daily on a net basis. At the end of a network's business day, the network operator calculates the net settlement position of each member. The settlement of net positions may occur through electronic funds transfers, such as ACH, or through correspondent balances held at a settlement bank. In some instances, the Federal Reserve acts as the settlement bank.

Both credit card companies and shared ATM networks are attempting to form nationwide POS systems. Visa and MasterCard, for example, have greatly expanded their efforts to establish nationwide POS systems in the United States. In addition, regional ATM networks have been forming alliances for the purpose of offering both ATM and POS services over larger geographical areas.

## 3.2 Major large-value funds transfer systems

There are two major large-value payment transfer systems in the United States: (1) the Fedwire funds transfer system (Fedwire), operated by the Federal Reserve System, and (2) the Clearing House Interbank Payments System (CHIPS), operated by the New York Clearing House Association (NYCHA). Generally, these payment systems are used by financial institutions and their customers to make large-dollar, time-critical transfers. In addition, financial institutions use Telex,

19 Source: *American Banker*, 24th June, 1993.

S.W.I.F.T., and other message systems to send payment instructions to their correspondents for the transfer of correspondent balances or for the initiation of Fedwire or CHIPS payments.

### *3.2.1 Fedwire funds transfer system*

The Federal Reserve's Fedwire funds transfer system is a real-time, gross settlement system in which the sender of the funds initiates the transfer (that is, a credit transfer system). The Fedwire system also includes a separate electronic, book-entry, government securities transfer facility, which is discussed in Section 4.2. Fedwire links the twelve Federal Reserve Banks to participating institutions and several Federal government agencies.

In general, deposit-taking institutions (including US branches and agencies of foreign banks) that maintain a reserve or clearing account on the books of a Federal Reserve Bank may use Fedwire directly to send or receive payments. Of the 11,200 institutions that maintain such accounts, approximately 11,000 are users of the Fedwire funds transfer service. Fedwire participants may transfer funds to another institution's Federal Reserve account, either for the benefit of the receiving institution or for the benefit of a third party, such as a respondent institution, a corporate customer, or an individual customer.

Fedwire funds transfers are primarily used for payments related to interbank overnight loans, interbank settlement transactions, payments between corporations, and settlement of securities transactions. In 1992, there were 68 million Fedwire funds transfers valued at US$ 199 trillion. The average size of a funds transfer transaction over Fedwire was approximately US$ 3 million.

#### *(a) Operation of the transfer system*

The Fedwire funds transfer system operates from 8.30 a.m. to 6.30 p.m. Eastern time. As a fully automated, gross settlement system, the Fedwire system permits the electronic initiation, processing, and completion of individual funds transfers in real time. Once initiated by a sending institution with an account at a Federal Reserve Bank, a Fedwire funds transfer is processed by the Federal Reserve, with funds debited to the sending institution's Federal Reserve account and credited to the receiving institution's account, normally within seconds of the transfer being initiated. The Federal Reserve's real-time daylight accounting system, the Account Balance Monitoring System (ABMS), tracks changes in institutions' account balances resulting from Fedwire funds and securities transfers on a real-time basis. The ABMS accounts for other transactions processed by the Federal Reserve, such as cheque settlements, according to a comprehensive intraday posting schedule.

Fedwire payment messages are currently sent over an inter-district communications network that links the twelve Federal Reserve Banks and their local communications networks, which in turn link financial institutions to the Reserve Banks. Payment messages from financial institutions are routed to their local Reserve Bank's host computer system for processing. If the payment message is destined for an institution in another Federal Reserve district, the message is sent through the communication node to the other Reserve Bank for further processing on its host computer, and ultimately is communicated to the receiving institution through on-line or off-line notification. Under the Federal Reserve's automation consolidation project (see Section 5.4.2) it is planned that critical national payment systems, including the Fedwire funds transfer system, will operate at a single computer site at the Federal Reserve Bank of New York, with backup facilities located at other Reserve Banks.

Over 70% of the users (representing 99% of the volume) of the Fedwire funds transfer system are linked electronically to the Federal Reserve. Institutions originating a high volume of transfers (more than 1,000 transfers per day) generally are linked by dedicated leased lines to the Federal Reserve. Medium to low-volume institutions (fewer than 1,000 transfers per day) generally use shared leased lines or dial-up lines to link their terminals or personal computers to the Federal Reserve. Less than 30% of Fedwire users initiate funds transfers off-line through telephone

instructions to a Reserve Bank. Deposit-taking institutions without electronic or off-line access to Fedwire rely on correspondents to initiate funds transfers on their behalf.

In general, the rights and liabilities of the parties to a Fedwire funds transfer are governed by the Federal Reserve's Regulation J, Subpart B, which incorporates Article 4A of the Uniform Commercial Code. An institution that sends a Fedwire funds transfer authorises the Federal Reserve Bank holding its account to debit its account for the amount of the funds to be transferred. This authorisation is irrevocable once the Federal Reserve Bank executes the funds transfer. The funds transfer is final upon credit to the receiving institution's Federal Reserve account. When a receiving institution receives a Fedwire funds transfer on behalf of a customer, the Federal Reserve's Regulation CC requires that the institution make the funds from that transfer available to the customer no later than the opening of the next business day. In practice, however, institutions generally make funds from Fedwire transfers available for withdrawal on the day the transfer is received, unless the transfer is received late in the day.

#### *(b) Pricing policies*

In 1993, the price of a Fedwire funds transfer made electronically was US$ 1.06, with US$ 0.53 paid by the originator and US$ 0.53 paid by the receiver. The price to originate an off-line transfer by telephone was US$ 10. Institutions advised of incoming transfers by telephone are charged US$ 10 per call. Institutions also pay connection fees to cover the cost of establishing and maintaining a data-transmission link; these links are used for other Federal Reserve services in addition to Fedwire, however. Monthly fees for dedicated or computer interface connections were US$ 700; shared leased-line connections were US$ 300; and dial-up connections were US$ 65.

#### *(c) Risk management policies*

In 1985, the Federal Reserve adopted a formal policy to reduce risk in the payment system, including the Fedwire funds transfer system. This policy relies, in part, on net debit caps on daylight overdrafts in Federal Reserve accounts and, in certain cases, collateral to control intraday credit risks. Section 5.2 contains a discussion of the Federal Reserve's payment system risk policies.

### *3.2.2 Clearing House Interbank Payments System (CHIPS)*

CHIPS is a private sector payment system owned and operated by the New York Clearing House Association (NYCHA). It began operation in 1971 as an electronic replacement for an existing paper-based payments clearing arrangement. Like Fedwire, CHIPS is a credit transfer system; unlike Fedwire, however, CHIPS nets payment transactions multilaterally and settles the net obligations at the end of the day.

CHIPS participants may be commercial banks, Edge Act corporations, investment companies as defined by New York state banking law, or banking affiliates of a commercial banking institution with an office in New York City. A non-participant wishing to send payments over CHIPS must employ a CHIPS participant to act as its correspondent or agent. At the end of 1992, the CHIPS network had 122 participants. Of these, 86 were US branches or agencies of foreign banks and 36 were US-chartered institutions.[20] There were 19 settling participants involved in the settlement of CHIPS transactions at the end of each business day. Eleven of these settling participants settle only for their own account and eight settle for as few as two or as many as 32 non-settling participants.

The payments transferred over CHIPS are primarily related to interbank transactions of an international nature, including the dollar payments resulting from foreign currency transactions

20 As of 29th October 1993, CHIPS had 120 participants, including 18 who settled for themselves and others and 10 who settled only for their own account.

(including spot and currency swap contracts) and Eurodollar placements and returns. Payment instructions also are sent over CHIPS for the following purposes: settling obligations on other payment or clearing systems, adjusting correspondent balances, and making payments associated with commercial transactions, bank loans, and securities transactions. In 1992, nearly 40 million payments valued at US$ 240 trillion were made through CHIPS.

CHIPS participants are subject to the supervision of state or federal banking supervisors, and CHIPS itself has been subject to annual examinations by state and federal banking authorities. Eleven New York money-centre banks make up the membership of the New York Clearing House Association, each of which is represented on the Clearing House Committee that establishes the rules for the operation of CHIPS. Non-members must agree to abide by the CHIPS rules.

### *(a) Operation of CHIPS*

CHIPS normally operates from 7.00 a.m. to 4.30 p.m., eastern time, with settlement usually completed before 6.00 p.m. The CHIPS communications network is a single-node network with all participants connected directly to a single message-switching centre. CHIPS maintains a primary and a back-up processing site. Participants are connected directly to both the primary CHIPS processing site and to the CHIPS back-up site.[21] All connections have additional dial-up lines for contingency purposes.

During operating hours, CHIPS acts as a payment message switching and accounting centre between its participants. Each participant begins the business day with a starting balance of zero. CHIPS calculates the net position of each participant relative to each other participant continuously during the day based on payment messages sent and received. Payment messages can be entered for same-day or future-day value. Same-day messages are processed immediately upon release by the sender unless they would cause the sender to exceed its bilateral credit limits or net debit cap (described under "Risk management policies," below). Once a payment message is released to the receiver, it cannot be revoked by the sending institution.

Settlement occurs through designated settling participants. Non-settling participants must rely on the settling participants as correspondents to settle for them. Soon after 4.30 p.m. each day, the clearing house informs every participant of its net position and each settling participant of the overall net positions of the participants for which it settles (net-net position).[22] If the net-net position of a settling participant is a net debit, the settling participant is required to transfer funds to a CHIPS net settlement account at the Federal Reserve Bank of New York via a Fedwire funds transfer by 5.45 p.m. Once all net debit obligations have been paid, the clearing house transfers funds via Fedwire to all settling participants in a net-net credit position and notifies all participants, typically before 6.00 p.m., that settlement is complete.

### *(b) Pricing policies*

In recovering the costs of operating CHIPS, NYCHA acts like a cooperative, allocating its total costs for operations among the participants according to CHIPS usage (the number of messages sent and received during the previous month). There is a minimum charge of US$ 1,500 per month. High volume users (over 80,000 messages a month) are charged US$ 0.13 for each message sent or received. Other users are charged for the type of message sent. If a message is not coded (or

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21 CHIPS participants must maintain data communications circuits and two computer processing facilities in the New York City area (a central processing facility and a contingency processing center). In addition, settling participants must maintain a book-entry securities account and a clearing account at the Federal Reserve Bank of New York.

22 Participants are also informed of their net position with respect to every other participant in order to assist participants in reconciling their accounts with CHIPS.

"qualified") with the receiver's identification using the CHIPS Universal Identification File, the sender is charged US$ 0.40.[23] All receivers, except high volume receivers, are charged US$ 0.18.

#### *(c) Risk management policies*

Because each CHIPS participant begins the day with a zero balance, credit must be extended among participants in order for them to make payments to one another. However, each CHIPS participant limits its credit exposure to every other participant, in part by setting a limit, known as a bilateral credit limit, on the net amount of credit that it will extend to another participant in the course of sending and receiving payments. A participant can set a bilateral credit limit at zero and may change its bilateral limits at any time.

In addition to the bilateral credit limits, the clearing house imposes a binding CHIPS net debit cap on each participant. This cap limits a participant's overall (multilateral) net debit position vis-a-vis all other CHIPS participants. For each participant, the net debit cap is equal to 5% of the sum of the bilateral limits set for it by the other participants; the cap changes with a one-day lag whenever the bilateral credit limits change.

The CHIPS operating system continuously and automatically monitors payment messages that participants attempt to release to receiving institutions, in relation to the sending participants' bilateral credit limits as well as their net debit caps. The system will not permit the release of any attempted transfers that would cause a sending participant to violate any of these limits.

Liquidity risk among CHIPS participants is managed by the following means. Firstly, participants are required to maintain a reasonable level of liquid assets. The president of NYCHA has the authority to review the financial statements of a participant and to require that the participant improve its liquidity if it is perceived that there might be a liquidity problem. Secondly, CHIPS provides an on-line, real-time inquiry system that permits a participant to monitor its net position and potential need for liquidity. Thirdly, the clearing house limits the maximum amount of liquidity that a participant could potentially require by imposing caps on participants' net debit positions. Fourthly, back-up terminals and operational reliability are required to minimise the liquidity risks that might result from operational failure.

Lastly, should a participant fail to settle, CHIPS loss-sharing rules will allocate "additional settlement obligations" to the remaining participants (based on their bilateral credit limits with a defaulting participant) in order to cover the settlement shortfall.[24] These contingent settlement liabilities must be collateralised. Should a non-defaulting participant be unable to meet its additional settlement obligations, its collateral could be used to obtain liquidity. CHIPS procedures ensure that sufficient collateral will be available to cover a default by the largest system net debtor.

### 3.3 Major projects and policies being implemented

#### *3.3.1 Legal validation of netting contracts*

Statutory provisions contained in the Federal Deposit Insurance Corporation Improvement Act of 1991 (FDICIA) affirmed the legal validity of the formal bilateral and

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23 Beginning 1st October 1993, the sender of a message will be charged US$ 0.25 if the message is coded either with a S.W.I.F.T. receiver identification code or with the receiver's routing and account numbers (that is, "partially qualified").

24 CHIPS rules provide certain limits, however, on the amount of such losses that may be allocated to remaining participants.

multilateral netting contracts of deposit-taking institutions, brokers and dealers, futures commission merchants, clearing houses, and other qualified financial institutions.[25] The statutory changes provide assurances that netting contracts between and among qualified financial institutions will be enforced, even in the event of the insolvency of one of the parties.

In addition, under the FDICIA provisions, the Federal Reserve was granted authority to define by regulation or order "other qualified financial institutions." In May 1993, the Federal Reserve proposed a regulation to expand the definition of "financial institutions" that qualify under the FDICIA netting validation provisions. A final rule will be issued following analysis of public comments.

### *3.3.2 Electronic cheque presentment[26]*

In the United States, efforts to improve the efficiency and reduce the risk created by the cheque collection mechanism have begun to focus on converting cheque data to electronic form and transmitting those data via communication networks to the payer bank. The greatest efficiencies can be achieved when cheques are truncated early in the collection process. Cheque truncation requires the bank truncating the cheques to convert the cheque data to electronic form, safekeep the cheques, return cheques at the request of the payor bank, and provide information on cheques when requested.

Federal law requires credit unions to truncate all share drafts that they issue. In addition, all of the approximately 500 million cheques issued annually by the US government are truncated when they are presented for payment at a Federal Reserve office. All Federal Reserve offices also offer truncation services to payor institutions in their local territories. Currently, approximately 235 deposit-taking institutions use the Federal Reserve's truncation services. The National Association of Cheque Safekeeping (NACS) promulgates rules and sets standards for interbank cheque truncation. Participants in NACS, including several Federal Reserve Banks, use the ACH mechanism to exchange and settle electronic cheque transactions nationally.

Other efforts to increase the use of electronic technology in the cheque collection process are being launched. A number of large commercial banks are participating in the Electronic Cheque Clearing House Organization (ECCHO). This is a national organisation in which participants agree to exchange electronic cheque data before the physical cheques are presented for payment. The early exchange of electronic data can reduce risk to participants by permitting them to identify cheques that cannot be paid and must be returned earlier than would otherwise be possible.

The Federal Reserve also provides a number of electronic cheque information services as well as electronic presentment services. Electronic cheque information services are typically designed to provide information needed by banks to provide cash management services to corporate customers. Electronic cheque presentment services range from cheque truncation to presentment services, in which physical cheques are delivered to the payor bank on the day of presentment or several days later. At the end of 1992, about 140 deposit-taking institutions used the Federal Reserve's electronic cheque presentment services.

The Federal Reserve has also been involved in a research and development effort to determine the feasibility of improving its cheque collection operations using "image technology." By providing images of cheques to payor institutions, the institution is able to reduce its risk of paying forged or altered cheques and may provide statements to customers containing the images of the cheques that have been paid.

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25 See 12 U.S.C. 4401-4407.

26 Cheque "presentment" is common terminology in the United States for what is sometimes referred to as cheque "presentation" in other countries.

### *3.3.3 Same-day settlement for cheques*

The Federal Reserve recently amended its Regulation CC to grant private collecting institutions rights to present cheques to and obtain settlement from payor banks that are similar to the rights of the Federal Reserve Banks. Specifically, effective 3rd January, 1994, payor banks will be required to settle for cheques presented to them directly by private collecting institutions on the day of presentment, if the cheques are presented by 8.00 a.m. local time. The same-day settlement rule eliminates many of the barriers that payor banks have established to prevent private banks from presenting cheques to them directly.

## 4. EXCHANGE AND SETTLEMENT OF INTERNATIONAL PAYMENT AND SECURITIES TRANSACTIONS

### 4.1 Exchange and settlement systems for international payments

Cross-border funds transfers to or from the United States occur through a variety of mechanisms, including cash, cheques, credit and debit cards, and electronic payment orders. Clearance and settlement of these transactions are completed primarily through international correspondent banking relationships or through a bank's own organisation. In some cases, central banks cooperate to effect certain small-value transfers, as described below.

### *4.1.1 Retail payments*

Cash and cheque payments in foreign currency are rare in the United States and are generally not accepted by merchants, with the exception of Canadian currency along the US/Canada border. Traveller's cheques denominated in US dollars are widely used in the United States by tourists. Since the advent of credit and debit cards, these instruments are also commonly used at the retail level by tourists as well as other customers. International postal money orders are used in some instances to make payments to recipients outside the United States, but the volume of these payments is small.

Credit and debit cards that are issued by foreign-based banks, as well as ATM cards, are also widely used by non-US residents to complete retail transactions in the United States. Many credit cards and some debit and ATM cards issued by US-based institutions can also be used to obtain cash or make payments by US residents travelling abroad.

Small-value electronic transfers to and from the United States are used in only a few instances, including certain government payments to non-residents. For example, the US government provides for the electronic transfer (direct deposit) of benefit payments to US social security recipients living in several other countries. Accounts are maintained at a foreign central bank or commercial bank and at the Federal Reserve in order to effect the transfer of such payments to local financial institutions. In addition, benefit payments from the United Kingdom to recipients residing in the United States may also be accomplished through an international direct deposit mechanism. Other international retail funds transfers are confined mainly to merchant trade transactions through correspondent banks.

### *4.1.2 Wholesale payments*

Large-value cross-border payment orders are transmitted through one of several available dedicated message networks operated by internationally active banks, corporations, such as General

Electric Information Services, or cooperatives such as S.W.I.F.T.[27] Settlement of dollar obligations arising from international transactions is normally accomplished using correspondent banking relationships or a large-value payment system (Fedwire or CHIPS), or both.

## 4.2 Exchange and settlement systems for securities transactions

Major categories of financial instruments commonly traded in the United States include corporate equities and bonds, municipal (state and local) government securities, US government securities, money market instruments, and derivatives, such as swaps and exchange-traded options and futures. The legal framework for trading, clearance, and settlement of these instruments includes state laws as well as various provisions of the federal securities and commodities laws and regulations.[28]

These instruments are generally traded either through recognised exchanges or through over-the-counter dealer markets. The mechanisms for clearance and settlement vary by type of instrument, and generally involve specialised financial intermediaries, such as clearing corporations and depositories.

### *4.2.1 Corporate and municipal securities*

Corporate equities and bonds are traded on seven stock exchanges and over the counter; municipal government securities are traded over the counter. Settlement of trades in these securities occurs through a national clearance and settlement network comprising four clearing corporations and three depositories. Clearing corporations provide trade comparison and multilateral netting of trade obligations. The National Securities Clearing Corporation (NSCC) clears the vast majority of corporate equity and bond trades in the United States. Other clearing corporations include the Midwest Clearing Corporation, the Stock Clearing Corporation of Philadelphia, the Boston Stock Exchange Clearing Corporation, and the Pacific Stock Exchange Clearing Corporation.

Depositories, in contrast to clearing corporations, immobilise physical securities and provide book-entry transfer and settlement services for their members. Most corporate securities, as well as municipal government bonds, are immobilised at the Depository Trust Company (DTC). Other depositories include the Midwest Securities Trust Company and the Philadelphia Depository Trust Company, which are affiliated with the Midwest Clearing Corporation and the Stock Clearing Corporation of Philadelphia, respectively.

Settlement of corporate and municipal securities typically occurs on a net securities and net funds basis or on a trade-for-trade and net funds basis with payment by cheque or draft in funds available on the next business day (clearing house funds). In 1992, the NSCC cleared, on a gross basis, over 140 million equity and bond transactions valued at approximately US$ 11 trillion, while the DTC settled about 83 million book-entry transactions valued at US$ 19 trillion through its Next-Day Funds Settlement service.

Several clearing corporations and depositories for corporate and municipal securities are linked electronically, allowing members of one clearing corporation or depository to settle with members of another without the need for physical delivery of securities between depositories. The NSCC also has links with other domestic and foreign clearing organisations, such as the Options

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27 Of the 2,200 owners of S.W.I.F.T., 155 are based in the United States. Of the nearly 3,900 user institutions of S.W.I.F.T., about 400 are located in the United States, including money-centre banks, regional banks, investment companies, and branches of foreign financial institutions.

28 The Securities and Exchange Commission (SEC) is responsible for enforcement of the securities laws, including regulatory oversight of exchanges and clearing agencies for securities and options on securities. The Commodity Futures Trading Commission (CFTC) has regulatory oversight over futures exchanges and clearing houses.

Clearing Corporation and the Canadian Depository for Securities, Ltd. The DTC also has links, through accounts sponsored by the International Securities Clearing Corporation, with the Central Depository, Ltd. (Singapore) and the Japan Securities Clearing Corporation.

### *4.2.2 US government securities*

US Treasury, federal agency, and mortgage-backed securities are generally traded in over-the-counter dealer markets. The Government Securities Clearing Corporation (GSCC) compares and nets its members' trades in most US Treasury and federal agency securities. In 1992, the GSCC cleared about 3 million trades valued at about US$ 25 trillion which resulted in approximately US$ 5 trillion in net transfers of securities. GSCC relies on the Fedwire book-entry securities transfer system, discussed below, to effect final delivery of securities to its participants.

The Mortgage-Backed Securities Clearing Corporation, a subsidiary of the Midwest Stock Exchange, compares and nets trades in mortgage-backed securities. The resulting net obligations are settled either over the Fedwire book-entry securities system, or through the Participants Trust Company (PTC), a New York-based depository, depending on the securities involved.[29] In 1992, PTC processed about 3 million transactions valued at over US$ 1 trillion.

The Federal Reserve is the depository for all marketable US Treasury securities, many federal agency securities, and certain mortgage-backed securities issued by government-sponsored enterprises.[30] These securities generally exist in book-entry form only. Deposit-taking institutions may maintain book-entry securities accounts at the Federal Reserve, in which they hold their own securities and those of customers.

Settlement for most government securities occurs over the Fedwire book-entry securities transfer system, which, like the Fedwire funds transfer system, is owned and operated by the Federal Reserve. Fedwire is a real-time, delivery-versus-payment gross settlement system that allows immediate and simultaneous transfer of securities and settlement in same-day funds. Transfers are initiated by the sender of the securities and result in a simultaneous debit and credit to the sender's book-entry securities and funds accounts, respectively, and a credit and debit to the receiver's securities and funds accounts, respectively, at the Federal Reserve. The Fedwire book-entry system normally operates between 8.30 a.m. and 2.30 p.m. eastern time. There are more than 8,500 participants in the system. Approximately twelve million securities transfers valued at US$ 140 trillion were processed in 1992.

### *4.2.3 Money market instruments*

DTC offers a book-entry transfer and settlement mechanism, known as the Same-Day Funds Settlement (SDFS) service, which settles in same-day available funds using Fedwire funds transfers rather than cheques settled on a next-day basis. Transactions in money market instruments, such as certain commercial paper, collateralised mortgage obligations, medium-term notes, asset-backed securities, municipal notes, and variable-rate demand obligations, are eligible to be cleared and settled through the SDFS service provided by DTC. Transactions are settled on a net funds basis at the end of the day. In 1992, the SDFS service processed about 1.9 million deliveries valued at US$ 9.7 trillion.

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29 The Fedwire book-entry securities system settles mortgage-backed securities transactions in Federal National Mortgage Association (Fannie Mae) securities and Federal Home Loan Mortgage Corporation (Freddie Mac) securities. PTC settles mortgage-backed securities guaranteed by the Government National Mortgage Association and collateralised mortgage obligations of the Veterans Administration. A few mortgage-backed securities transactions are still settled through the exchange of physical certificates and payment.

30 The Federal Reserve also acts as agent and depository for the securities of certain international organisations, such as the World Bank.

#### *4.2.4 Derivative instruments*

Option contracts, such as those on equities, equity indexes, foreign currencies, and interest-rate instruments, are traded on five exchanges as well as in the over-the-counter markets. All listed options are cleared and settled through a single clearing house, the Options Clearing Corporation. In 1992, the Options Clearing Corporation cleared approximately 200 million transactions. Futures contracts and options on futures are traded on eleven futures exchanges, and are cleared and settled through nine clearing houses associated with the exchanges. Approximately 295 million futures contracts were traded in 1992.

#### *4.2.5 Physical securities*

A small volume of instruments in the United States still settle by the physical exchange of securities and funds. These securities are often not easily converted to a book-entry or depository system as a result of unique characteristics. Settlement occurs directly between counterparties or, at times, through physical presentment in a clearing house arrangement. Payment may be made by cheque or by electronic funds transfer.

#### *4.2.6 Future developments*

In October 1993, the SEC adopted a rule that establishes three business days as the standard settlement timeframe for broker-dealer securities trades, effective from 1st June 1995. NSCC and DTC are developing a system to convert their settlement of transactions that settle on a next-day funds basis to a same-day funds basis in order to implement one of the recommendations of the Group of Thirty.[31] In addition, DTC is working towards implementing an interactive institutional delivery confirmation and affirmation system in order to facilitate the settlement of institutional trades on the third business day following the trade date.

The Federal Reserve is in the process of designing a new, centralised, book-entry government securities transfer system, with implementation expected in the 1995-96 period. (See Section 5.4 for further discussion of the Federal Reserve's automation consolidation project.)

## 5. THE ROLE OF THE CENTRAL BANK IN INTERBANK SETTLEMENT

### 5.1 General responsibilities

#### *5.1.1 Statutory and supervisory responsibilities*

Since its establishment by the Federal Reserve Act, the Federal Reserve has played an important operational role in the US payment system. Subsequent legislation has clarified and, in some cases, expanded the Federal Reserve's role in the payment system. The Monetary Control Act of 1980, which amended the Federal Reserve Act, required all deposit-taking institutions to meet reserve requirements set by the Federal Reserve and extended access to Federal Reserve payment services to all such institutions.

Sections 13 and 16 of the Federal Reserve Act authorise each Federal Reserve Bank to receive cheques for the purposes of collection and exchange at par value. Section 16 also provides that the Board of Governors may require each Reserve Bank to exercise the functions of a clearing

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31 Group of Thirty, *Report on Clearance and Settlement Systems in the World's Securities Markets*, March 1989.

house for deposit-taking institutions. In addition, the Expedited Funds Availability Act of 1987 gave the Board of Governors the ability to regulate the receipt, payment, collection, or clearing of cheques, whether collected through the Federal Reserve or through correspondent banking or clearing house arrangements.

Sections 13 and 16 of the Federal Reserve Act also serve as the statutory basis for the Federal Reserve's involvement in the electronic funds transfer and automated clearing house services. Section 13 authorises Federal Reserve Banks to receive deposits from their members and other deposit-taking institutions and Section 16 authorises the Board of Governors to regulate the transfer of those deposits among Federal Reserve Banks.

Beyond its own provision of payment services and its regulatory authority over cheque collection, the Federal Reserve has supervisory responsibility for certain financial institutions, as described in Section 1.3. To the extent that these individual institutions participate in payment arrangements or offer payment services, the Federal Reserve may review their payment operations as part of its examination function.

In addition, the Federal Reserve coordinates its supervisory procedures with other US banking supervisors through the Federal Financial Institutions Examination Council (FFIEC), an inter-agency body established in 1978. The FFIEC's purpose is to prescribe uniform principles, standards, and report forms for the federal examination of financial institutions and to promote coordination in other areas of supervision. The Federal Reserve also works with the US Treasury, the Securities and Exchange Commission and the Commodities Futures Trading Commission on issues regarding the clearance and settlement of securities and derivative financial instruments.

#### *5.1.2 Influence on payment rules and standards*

To a significant extent, the Federal Reserve influences payment standards and rules through its own provision of payment services and the terms and conditions under which those services are provided to institutions resident in the United States. For example, the Federal Reserve conditions its provision of Fedwire funds transfer and net settlement services on the adherence of the institutions and settlement arrangements using those services to Federal Reserve risk reduction policies, described in Section 5.2.3. The Federal Reserve also participates on standard setting bodies dealing with such issues as cheque imaging and data security.

### 5.2 Provision of settlement facilities

#### *5.2.1 Settlement through Federal Reserve accounts*

Most deposit-taking institutions meet their reserve requirements in part by holding reserves in accounts at a Federal Reserve Bank. Some institutions also choose to hold excess reserves or voluntary clearing balances. These balances and the associated accounts in which they are held form the monetary foundation for the Federal Reserve's provision of payment and settlement services. Debits and credits are posted to institutions' reserve and clearing accounts as a result of payments made through Federal Reserve services, such as Fedwire funds and securities transfers, cheques and ACH, as well as from settlement payments made by private sector clearing arrangements using the Federal Reserve's net settlement services, described below. In addition, deposit-taking institutions may maintain book-entry securities accounts with the Federal Reserve, through which settlement of many US Treasury and agency securities transactions occurs. (See Section 4.2.2 for further discussion of the Federal Reserve's Fedwire book-entry securities transfer system.)

### *5.2.2 Net settlement services*

In addition to settlements associated with the payment services it offers, the Federal Reserve provides a unique service, commonly referred to as net settlement, to private sector clearing and settlement arrangements that wish to settle their net payment obligations across the books of the Federal Reserve. Arrangements that typically take advantage of this service, which number more than 150, include both local payment associations and networks, such as cheque clearing houses, regional automated clearing houses, and ATM and credit card networks, and national arrangements, such as CHIPS, PTC, Visa, and the National Clearing House Association (which clears cheques for its members).

To settle net obligations across the books of the Federal Reserve Banks, private sector netting arrangements typically calculate the net debit or net credit obligation of each participant at the end of each business day. An agent for the arrangement may present a settlement statement to the Federal Reserve listing each participant's net position. The Federal Reserve, in turn, posts the net settlement debit or credit entries to the respective participants' accounts. Alternatively, an agent may instruct participants with net debit positions to initiate Fedwire funds transfers to the arrangement's settlement account at the Federal Reserve.[32] Once the settlement account is fully funded, the agent transfers funds to participants in a net credit position. The latter method is encouraged for large-value netting arrangements in order to increase the transparency and enhance administration of funds transfers associated with net settlement activities occurring on the books of the Federal Reserve.

In 1992, about 650,000 net settlement entries were processed by the Federal Reserve for local netting arrangements; the value of these entries was about US$ 640 billion. An estimated US$ 2.3 trillion in net settlements were processed through special Fedwire settlement accounts for national arrangements in 1992.

### *5.2.3 Payment system risk policies*

In 1985, the Board of Governors of the Federal Reserve System adopted a policy to reduce the risks that large-dollar payment systems present to the Federal Reserve Banks, to the banking system, and to other sectors of the economy. An integral component of the ongoing policy has been the Federal Reserve's program to control daylight overdrafts in Federal Reserve accounts.

Because Fedwire funds transfers are final and irrevocable at the time of receipt by the receiving institution, the Federal Reserve effectively guarantees their payment. Thus any daylight overdraft in a Federal Reserve account incurred by the sender of a Fedwire funds transfer results in a credit exposure for the Federal Reserve to that institution.[33] Total peak daylight overdrafts in Federal Reserve accounts amounted to approximately US$ 170 billion per day, on average, during 1992.

Under the Federal Reserve's policy on payment system risk, the Federal Reserve typically provides intraday credit to healthy deposit-taking institutions on an uncollateralised basis up to a net debit cap, or limit, which is generally set as a multiple of an institution's risk-based capital. The Federal Reserve also has the ability to monitor institutions' intraday Federal Reserve account balances. For institutions deemed to pose special risks, the Federal Reserve may reject Fedwire funds transfers that would cause an overdraft in the account. In addition, in certain instances, the Federal Reserve Banks will require collateral to secure intraday credit.

The Federal Reserve's payment system risk policy also addresses the control of risks in Fedwire funds transfers, Fedwire book-entry securities transfers, ACH transactions, and other payments processed through the Federal Reserve, as well as private sector, offshore, dollar clearing

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32 Net settlement accounts at the Federal Reserve are limited-purpose, zero-balance accounts that are used solely for the purpose of administering and completing these settlement payments.

33 The Federal Reserve requires daylight overdrafts to be extinguished by the end of the day.

and netting arrangements, and private, delivery-against-payment clearance and settlement systems that settle in same-day funds.

#### *5.2.4 Pricing of payment services*

The Monetary Control Act of 1980 required the Federal Reserve to charge fees for payment services provided to deposit-taking institutions, including, for example, cheque collection, ACH, Fedwire, and net settlement services. The Monetary Control Act also specified that the Federal Reserve was to set fees in such a way that revenues would recover the costs of providing payment services over the long term. The Federal Reserve is required to include in its calculation of costs not only its actual operating expenses, but also estimates of the taxes and cost of capital it would incur if it were a private firm, the so-called Private Sector Adjustment Factor (PSAF). (Fees for specific Federal Reserve services are discussed in Sections 3.1 and 3.2.)

### 5.3 Monetary policy and the payment system

The Federal Reserve's primary tool for conducting monetary policy is open market operations in the US government securities market. Open market operations are executed by the Federal Reserve Bank of New York, on behalf of the Federal Reserve System, under the policy instructions of the FOMC. These operations take place through certain designated dealers in US government securities. For example, to increase banking reserves, the Federal Reserve either purchases government securities outright or engages in temporary repurchase transactions. To decrease reserves, government securities are sold outright or under a temporary matched sale-purchase contract.

The Federal Reserve, therefore, relies upon the government securities market and its attendant settlement mechanisms to conduct day-to-day monetary operations. In addition, the efficient redistribution of reserves in the banking system as well as those of financial intermediaries generally is dependent upon the timely daily settlement of money market and government securities transactions. Both the Fedwire funds and book-entry securities transfer systems play critical roles in settling these transactions.

### 5.4 Major projects and policies being implemented

#### *5.4.1 Daylight overdraft fees*

In 1992, the Board of Governors adopted a policy to charge fees, beginning in April 1994, for daylight overdrafts incurred in accounts at the Federal Reserve. The fee is set initially at an annual rate of 24 basis points, and will be raised to 48 basis points and then to 60 basis points in the subsequent two years. (The Board has reserved the right to adjust fees and the schedule for their implementation based on experience.) The rate is quoted on the basis of a 24-hour day, and is applied to institutions' average overdrafts incurred in their Federal Reserve accounts during the period that the Fedwire funds transfer system operates, currently ten hours.

The objective of the policy is to provide a financial incentive for institutions to control their use of intraday Federal Reserve credit and to recognise explicitly the risks inherent in the provision of intraday credit. In conjunction with the implementation of fees on daylight overdrafts, the Federal Reserve also adopted a revised methodology for measuring daylight overdrafts. This methodology includes a schedule for posting debits and credits from non-Fedwire transactions processed by the Federal Reserve, such as cheque and ACH, to institutions' Federal Reserve accounts during the day. Under the new measurement methodology, all Fedwire payments continue to be posted as they occur.

### *5.4.2 Automation consolidation*

In 1990, the Federal Reserve initiated a plan to consolidate its data processing operations. Currently, the majority of the twelve Federal Reserve Banks process payments at data processing centres located at each Reserve Bank head office, using software and computing environments that are almost identical. Contingency operations are supported at four other sites.

The Federal Reserve is in the process of consolidating these operations into three sites, with substantial completion expected by the end of 1994. In addition, the software for national payment functions such as the Fedwire and ACH systems will be entirely revised and centralised, a process that is expected to be completed by 1996. With three processing sites, the Federal Reserve will be able to utilise advanced computer and communications technology to make its payment services highly resistant to interruptions. Consolidation will also simplify the monitoring of the financial positions of deposit-taking institutions that operate in more than one Federal Reserve district.

The Federal Reserve is also in the process of implementing a new unified communications network, FEDNET, which will replace the existing Federal Reserve communications network connecting the Federal Reserve Banks and the Board of Governors, as well as the twelve intra-district networks, which connect each Federal Reserve Bank to deposit-taking institutions in its district. FEDNET has been designed to provide improved contingency backup and security and to permit significant increases in network traffic. FEDNET will have the capability for transmission of voice and video, in addition to data.

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Table 1

**Basic statistical data**

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Population (millions)[1] ..... | 245.0 | 247.3 | 249.9 | 252.7 | 255.5 |
| GDP (USD billions)[2] ..... | 4,900.4 | 5,250.8 | 5,546.1 | 5,722.9 | 6,038.5 |
| GDP per capita (in USD) | 20,001.6 | 21,232.5 | 22,193.3 | 22,647.0 | 23,634.1 |

[1] Data estimated as of 1st July each year. Includes Armed Forces overseas. [2] Annual data.

*Sources:* US Department of Commerce, Bureau of the Census and Bureau of Economic Analysis.

Table 2

**Settlement media used by non-banks[1]**

(in billions of US dollars)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Notes and coin[2] ..... | 217.4 | 228.1 | 249.5 | 270.3 | 298.1 |
| Transferable deposits[3] ..... | 574.3 | 575.7 | 596.6 | 641.9 | 742.7 |
| Narrow money supply ($M_1$)[4] ..... | 798.3 | 810.3 | 853.5 | 920.1 | 1,048.7 |
| *Memorandum item:* | | | | | |
| Broad money supply:[4] | | | | | |
| $M_2$ ..... | 3,079.9 | 3,240.2 | 3,362.7 | 3,448.1 | 3,497.1 |
| $M_3$ ..... | 3,918.3 | 4,060.6 | 4,127.9 | 4,161.9 | 4,156.6 |

[1] Weekly average for weeks ending 26th December 1988, 25th December 1989, 31st December 1990, 30th December 1991 and 28th December 1992. [2] Currency in circulation plus amounts of coin outstanding less amounts held by the Treasury, Federal Reserve banks and depository institutions. [3] Transferable deposits consist of demand deposits and other chequable deposits. [4] Composition of money stock measures is as follows: $M_1$: currency and coin + travellers' cheques + demand deposits + other chequable deposits. $M_2$: $M_1$ + overnight Euro-dollars and RPs + money market mutual funds (general purpose and broker dealer only) + money market deposit accounts + savings time accounts. $M_3$: $M_2$ + large time deposits (over US$ 100,000) + term RPs and Euro-dollars + money market funds (institutions only). Data not seasonally adjusted.

*Source:* Federal Reserve.

Table 3

**Settlement media used by banks**

(in billions of US dollars, except as noted)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Balances held at central bank[1] | 39.3 | 38.3 | 38.7 | 29.5 | 32.1 |
| Balances due from commercial banks[2] | 33.5 | 33.6 | 34.1 | 31.0 | 33.0 |
| *Memorandum items:* | | | | | |
| Banks' borrowing from central bank (USD millions)[3] | 2,170.0 | 481.0 | 190.0 | 218.0 | 675.0 |
| Required reserves[4] | 62.2 | 61.8 | 56.2 | 54.4 | 55.1 |

[1] Year-end balances of depository institutions held at Federal Reserve banks including reserve balances and required clearing balances. Data not seasonally adjusted. [2] Consists of year-end non-interest-bearing balances due from commercial banks in the United States. These transferable balances do not include immediately available funds, such as federal funds sold and securities purchased under agreements to resell (RPs), which together amounted to US$ 128.5, 147.9, 148.6, 150.9 and 162.0 billion at year-end 1988, 1989, 1990, 1991 and 1992 respectively. Data not seasonally adjusted. [3] Monthly average figures may be significantly different from year-end figures. Data not seasonally adjusted. [4] Required reserves are biweekly averages of daily figures for weeks ending 28th December 1988, 27th December 1989, 26th December 1990, 25th December 1991 and 30th December 1992. Vault cash used to satisfy required reserves in December (average of daily figures, not seasonally adjusted) amounted to US$ 25.9, 27.4, 28.9, 28.9 and 31.2 billion for 1988, 1989, 1999, 1991 and 1992 respectively.

*Source:* Federal Reserve.

Table 4

**Value of banknotes in circulation**

(at year-end, in billions of US dollars)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Total banknotes and coin outstanding[1] | 290.3 | 299.3 | 325.2 | 387.5[2] | 384.9 |
| Banknotes and coin held by depository institutions[3] | 30.2 | 32.3 | 37.4 | 37.4 | 36.6 |
| Banknotes and coin held by Treasury and Federal Reserve banks | 42.7 | 38.9 | 38.3 | 79.8[2] | 50.2 |
| Banknotes and coin outside Treasury and Federal Reserve banks | 247.6 | 260.4 | 286.9 | 307.7 | 334.7 |
| *of which*: | | | | | |
| *1 dollar* | *4.7* | *4.9* | *5.1* | *5.3* | *5.5* |
| *5 dollars* | *6.0* | *6.1* | *6.3* | *6.4* | *6.7* |
| *10 dollars* | *12.5* | *12.5* | *12.6* | *12.6* | *13.0* |
| *20 dollars* | *64.7* | *67.1* | *69.0* | *70.0* | *73.3* |
| *50 dollars* | *30.5* | *31.7* | *33.9* | *35.6* | *38.0* |
| *100 dollars* | *110.7* | *118.7* | *140.2* | *157.2* | *177.1* |
| *other*[4] | *1.1* | *1.1* | *1.1* | *1.2* | *1.2* |
| *coin* | *17.5* | *18.2* | *18.8* | *19.3* | *19.9* |
| Total banknotes and coin held by public | 217.4 | 228.1 | 249.5 | 270.3 | 298.1 |

[1] Total currency and coin outstanding. [2] The increase in currency outstanding in 1991 can be partly attributed to increased holdings of high-denomination notes by the Treasury, Federal Reserve banks and depository institutions prior to the introduction of notes with enhanced anti-counterfeiting devices. [3] Partly estimated. [4] Miscellaneous banknotes outstanding.

*Source:* US Treasury.

Table 5

**Institutional framework**

(at end-1992)

| Categories | Number of institutions | Number of branches[1] | Number of accounts (thousands, sight) | Value of accounts (billions, sight) |
|---|---|---|---|---|
| Central bank[2] ..... | 1(12) | 36 | 11.2[3] | 32.1[4] |
| Commercial banks ..... | 11,412 | 53,744 | . | 639.3[5] |
| Thrift institutions[6] ..... | 2,537 | 18,147 | . | 74.6[5] |
| Credit unions ..... | 13,079 | . | . | 29.5[5] |
| *Memorandum item:* | | | | |
| Branches and agencies of foreign banks ..... | 641 | . | . | . |

[1] Number of branches does not include head offices. [2] The Federal Reserve is the central bank. The Board of Governors is located in Washington, D.C. and there are twelve District banks located in Atlanta, Boston, Chicago, Cleveland, Dallas, Kansas City, Minneapolis, New York, Philadelphia, Richmond, St. Louis and San Francisco. Eleven regional cheque processing centres are not included in the number of branches. [3] Number of depository institution accounts at the central bank. [4] Consists of deposits by depository institutions at the central bank. [5] Consists of demand and other chequable deposits. Data not seasonally adjusted. [6] Includes savings banks (federal, state and mutual) and savings and loan associations that reported assets. At year-end 1992 there were: 428 mutual and state savings banks with 2,674 branches; 790 federal savings banks with 8,062 branches; 88 cooperative banks; 570 federal and 661 state savings and loan associations with 7,411 branches.

*Source:* Federal Reserve.

Table 6

**Cash dispensers, ATMs and EFTPOS terminals**[1]

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Cash dispensers and ATMs: | | | | | |
| *Number of networks* ..... | *125.0* | *100.0* | *90.0* | *75.0* | *73.0* |
| *Number of machines*[2] ..... | *72,500.0* | *75,632.0* | *80,156.0* | *83,545.0* | *87,330.0* |
| *Volume of transactions (billions)* ..... | *4.5* | *5.1* | *5.8* | *6.4* | *7.2* |
| *Value of transactions (USD billions)* ..... | *297.0* | *330.0* | *383.0* | *429.0* | *482.0* |
| EFTPOS:[3] | | | | | |
| *Number of networks*[4] ..... | *37.0* | *41.0* | *40.0* | *23.0* | *26.0* |
| *Number of terminals* ..... | *44,750.0* | *49,500.0* | *60,000.0* | *88,000.0* | *115,042.0* |
| *Volume of transactions (millions)* ..... | *99.6* | *129.6* | *180.0* | *245.4* | *333.0* |
| *Value of transactions (USD billions)* ..... | *1.0* | *4.0* | *6.0* | *6.4* | *8.0* |

[1] Estimates provided by POS News (Faulkner & Gray). Estimates are also available from H. Spencer Nilson (Oxnard, California). [2] Does not include card-activated terminals which do not dispense cash. [3] Personal Identification Number (PIN)-based debit EFTPOS. [4] Both shared and proprietary networks are included.

Table 7

**Number of payment cards in circulation**[1]

(in millions)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Cards with a cash function[2] | 160.5 | 166.1 | 173.0 | 177.3 | 179.9 |
| Cards with a cheque guarantee function[3] | . | . | . | . | . |
| Cards with a debit/credit function[3] | 340.1 | 377.5 | 425.8 | 439.3 | 462.3 |
| *of which:* | | | | | |
| *cards with a debit function*[4] | *93.3* | *109.9* | *136.4* | *139.3* | *146.8* |
| *cards with a credit function*[5] | *246.8* | *267.6* | *289.4* | *300.0* | *315.5* |
| Retailer cards | 481.6 | 475.0 | 469.1 | 464.4 | 462.7 |
| Oil company cards | 119.2 | 122.4 | 122.0 | 123.4 | 119.7 |
| Travel and entertainment cards | 21.4 | 23.5 | 24.5 | 24.1 | 22.4 |

[1] Cards that provide multiple functions (cash, debit and/or credit) are in widespread use. These cards are reported in more than one category. [2] ATM/Cash Dispenser Personal Identification Number (PIN) type debit cards. Prepaid cards which can also be used as a cash substitute are not included. [3] Reliable data on cheque guarantee "cards" are not available. In 1992, 393.5 million cheques valued at US$ 35.6 billion were guaranteed by third-party firms using positive file authorisation. In addition, over 1.2 billion cheques valued at US$ 78.4 billion were verified against negative file databases operated by third-party firms. [4] Includes VISA and MasterCard only. [5] Includes VISA, MasterCard, Discover and American Express Optima cards as well as travel and entertainment cards listed below.

*Sources:* H. Spencer Nilson (Oxnard, California) and POS News (Faulkner & Gray).

Table 8

**Payment instructions handled by selected payment systems: volume of transactions**

(in millions)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Large-value systems:[1] | | | | | |
| *CHIPS*[2] | *33.9* | *36.5* | *37.3* | *37.6* | *39.1* |
| *Fedwire*[3] | *56.7* | *59.5* | *62.6* | *64.7* | *67.6* |
| Cheque clearings: | | | | | |
| *private clearing houses and direct exchanges*[4] | *18,356.0* | *19,044.0* | *19,944.0* | *20,689.0* | *21,024.0* |
| *Federal Reserve*[5] | *18,314.0* | *18,702.0* | *19,307.0* | *19,412.0* | *19,728.0* |
| Automated clearing houses: | | | | | |
| *private*[6] | . | . | . | . | *114.0* |
| *Federal Reserve*[7] | *1,010.0* | *1,181.0* | *1,427.0* | *1,631.0* | *1,843.0* |
| *Memorandum item:* | | | | | |
| "On-us" cheques[8] | 14,320.0 | 15,154.0 | 16,149.0 | 17,364.0 | 17,648.0 |

[1] Number of originations. Data do not include non-value messages. [2] CHIPS, the Clearing House Interbank Payments System, is operated by the New York Clearing House Association. [3] Fedwire is operated by the Federal Reserve. [4] Cheques are processed either "on-us" (about 30%), or by regional private cheque clearing houses (about 36%, which includes direct exchanges), or by the Federal Reserve. Estimate. *Source:* Federal Reserve. [5] Includes personal cheques, commercial cheques, government cheques and postal money orders. [6] Private ACH transactions volume is estimated. [7] Data before 1991 do not include those items sent directly to the Federal Reserve by the New York Automated Clearing House but include these items in 1991 and thereafter. Includes all government and commercial debits and credits. Excludes debit items with no value such as notifications of changes in customer information. [8] Estimated.

Table 9

**Payment instructions handled by selected payment systems: value of transactions**

(in billions of US dollars)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Large-value systems: | | | | | |
| *CHIPS*[1] | *165,400.0* | *190,200.0* | *222,100.0* | *217,300.0* | *238,300.0* |
| *Fedwire*[2] | *160,000.0* | *182,600.0* | *199,100.0* | *192,300.0* | *199,200.0* |
| Cheque clearings: | | | | | |
| *private clearing houses and direct exchanges* | . | . | . | . | . |
| *Federal Reserve*[3] | *12,411.0* | *12,971.0* | *13,154.0* | *12,792.0* | *13,850.0* |
| Automated clearing houses:[4] | | | | | |
| *private* | . | . | . | . | *550.0* |
| *Federal Reserve*[5] | *3,693.0* | *4,232.0* | *4,661.0* | *6,912.0* | *8,458.0* |

[1] CHIPS, the Clearing House Interbank Payments System, is operated by the New York Clearing House Association. [2] Fedwire is operated by the Federal Reserve. [3] Includes personal cheques, commercial cheques, government cheques and postal money orders. *Source:* Federal Reserve. [4] The value of private ACH transactions is estimated. [5] Includes all government and commercial debits and credits. Data before 1991 do not include items sent directly to the Federal Reserve by the New York Automated Clearing House, but these items are included in 1991 and thereafter. Government ACH credit transactions included in total are estimated for 1988.

Table 10

**Transfer instructions handled by securities settlement systems: volume of transactions**

(in millions)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Federal Reserve: | | | | | |
| *Government securities*[1] | *10.3* | *10.9* | *10.9* | *11.1* | *11.8* |
| Depository Trust Company: | | | | | |
| *Corporate and municipal securities*[2] | *67.2* | *73.9* | *72.6* | *73.2* | *83.3* |

[1] US Treasury and agency securities transfers processed through the Federal Reserve's book-entry securities settlement system. Data exclude reversals (i.e. securities sent in error and returned to sender). [2] Book-entry securities deliveries processed by the Depository Trust Company's next-day funds settlement system.

Table 11

**Transfer instructions handled by securities settlement systems: value of transactions**

(in trillions of US dollars)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Federal Reserve: | | | | | |
| *Government securities*[1] ..... | *91.9* | *95.7* | *99.9* | *116.3* | *139.7* |
| Depository Trust Company: | | | | | |
| *Corporate and municipal securities*[2] ... | *8.1* | *9.2* | *8.8* | *13.9* | *19.4* |

[1] US Treasury and agency securities transfers processed through the Federal Reserve's book-entry securities settlement system. Data exclude reversals (i.e. securities sent in error and returned to sender). [2] Book-entry securities deliveries processed by the Depository Trust Company's next-day funds settlement system.

Table 12

**Indicators of use of various cashless payment instruments: volume of transactions**

(in millions)

| Instruments | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Cheques issued[1] ..... | 50,990.0 | 52,900.0 | 55,400.0 | 57,470.0 | 58,400.0 |
| Payments by card: | | | | | |
| *debit*[2] ..... | *172.0* | *215.0* | *278.0* | *301.0* | *505.0* |
| *credit*[3] ..... | *8,813.0* | *8,903.0* | *10,750.0* | *11,241.0* | *11,700.0* |
| Paperless credit transfers: | | | | | |
| *CHIPS* ..... | *33.9* | *36.5* | *37.3* | *37.6* | *39.1* |
| *Fedwire*[4] ..... | *56.7* | *59.5* | *62.6* | *64.7* | *67.6* |
| *Federal Reserve ACH*[5] | *668.7* | *767.7* | *940.8* | *1,058.6* | *1,189.5* |
| Direct debits: | | | | | |
| *Federal Reserve ACH*[6] | *341.3* | *413.6* | *486.6* | *572.6* | *653.8* |
| **Total**[7] ..... | 61,075.6 | 63,295.3 | 67,955.3 | 70,745.5 | 72,555.0 |

[1] Includes personal cheques, commercial and government cheques, commercial and postal money orders and travellers' cheques. Data for the volume of cheques not processed by the Federal Reserve are estimated. [2] Estimates are based on June data and include on-line POS debits and ACH/POS debits. *Source:* POS News (Faulkner & Gray, New York). [3] Includes all types of credit card transactions (i.e. bank, oil company, telephone, retail store, travel and entertainment, etc.). Bank cards include VISA and MasterCard credit cards only (excluding debit cards). *Source:* The Nilson Report (Oxnard, CA.). [4] Fedwire funds transfer volume only. [5] Does not include commercial "on-us" ACH credit transactions originated and received by the same bank. It is estimated that "on-us" items increase total ACH volume (debits + credits) by at least 13%. [6] Does not include commercial "on-us" debit items. Excludes debit items with no value such as notifications of changes in customer information. [7] Does not include 11.8 million government securities transfers on Fedwire in 1992 valued at US$ 139.7 trillion.

Table 13

**Indicators of use of various cashless payment instruments: value of transactions**

(in billions of US dollars)

| Instruments | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Cheques issued[1] ..... | 57,960.0 | 69,220.0 | 70,000.0 | 66,000.0 | 67,000.0 |
| Payments by card: | | | | | |
| *debit*[2] ..... | *9.1* | *10.9* | *13.5* | *16.3* | *21.8* |
| *credit*[3] ..... | *369.4* | *413.5* | *463.3* | *485.0* | *529.1* |
| Paperless credit transfers: | | | | | |
| *CHIPS* ..... | *165,400.0* | *190,200.0* | *222,100.0* | *217,300.0* | *238,300.0* |
| *Fedwire*[4] ..... | *160,000.0* | *182,600.0* | *199,100.0* | *192,300.0* | *199,200.0* |
| *Federal Reserve ACH*[5] | *942.9* | *1,135.8* | *1,423.8* | *2,092.2* | *2,690.6* |
| Direct debits: | | | | | |
| *Federal Reserve ACH*[6] | *2,749.7* | *3,096.1* | *3,236.7* | *4,819.4* | *5,767.0* |
| **Total**[7] ..... | 387,431.1 | 446,676.3 | 496,337.3 | 483,012.9 | 513,508.5 |

[1] Includes personal cheques, commercial and government cheques, commercial and postal money orders and travellers' cheques. Data for the volume of cheques not processed by the Federal Reserve are estimated. [2] Estimates are based on June data and include on-line POS debits and ACH/POS debits. *Source:* POS News (Faulkner & Gray, New York). [3] Includes all types of credit card transactions (i.e. bank, oil company, telephone, retail store, travel and entertainment, etc.). Bank cards include VISA and MasterCard credit cards only (excluding debit cards). *Source:* The Nilson Report (Oxnard, CA.). [4] Values of transactions processed on Fedwire Funds transfer system only. [5] Does not include commercial "on-us" ACH credit transactions originated and received by the same bank. It is estimated that "on-us" items increase total ACH volume (debits + credits) by at least 13%. Government ACH credit transactions included in the total are estimated for 1988. [6] Does not include commercial "on-us" debit items. [7] Does not include 11.8 million government securities transfers on Fedwire in 1992 valued at US$ 139.7 trillion.

Table 14

**Participation in S.W.I.F.T. by domestic institutions**[1]

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Members | 158 | 158 | 155 | 158 | 154 |
| *of which: live* | *156* | *152* | *152* | *152* | *151* |
| Sub-members[2] | 210 | 216 | 217 | 222 | 242 |
| *of which: live* | *191* | *200* | *205* | *212* | *230* |
| Participants[3] | 9 | 10 | 19 | 21 | 23 |
| *of which: live* | *7* | *8* | *10* | *14* | *17* |
| Total users | 377 | 384 | 391 | 401 | 419 |
| *of which: live* | *354* | *360* | *367* | *378* | *398* |
| *Memorandum items:* | | | | | |
| Total S.W.I.F.T.: | | | | | |
| *members* | *1,581* | *1,697* | *1,812* | *1,963* | *2,074* |
| *sub-members* | *1,228* | *1,315* | *1,469* | *1,607* | *1,738* |
| *participants* | *27* | *37* | *63* | *78* | *91* |
| *users* | *2,836* | *3,049* | *3,344* | *3,648* | *3,903* |

[1] Data for the United States and Puerto Rico. [2] Domestic users sponsored by members abroad. [3] Participants are not shareholders in S.W.I.F.T. and their message traffic over the network is restricted.

*Source:* S.W.I.F.T.

Table 15

**S.W.I.F.T. message flows to/from domestic users**[1]

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Total messages sent .... | 39,836,230 | 46,256,189 | 53,935,959 | 59,992,143 | 64,993,013 |
| *of which:* | | | | | |
| *category I*[2] ..... | *5,227,615* | *6,264,048* | *7,114,348* | *7,873,755* | *9,466,437* |
| *category II*[3] ..... | *8,154,411* | *9,387,084* | *10,698,462* | *11,499,568* | *12,243,759* |
| *of which:* | | | | | |
| *sent to/received from domestic users* ..... | *5,901,283* | *7,258,893* | *9,271,351* | *10,211,287* | *10,948,963* |
| Total messages received ..... | 44,731,964 | 51,204,503 | 58,194,552 | 64,593,442 | 70,982,141 |
| *of which:* | | | | | |
| *category I*[2] ..... | - | - | - | - | 15,225,444 |
| *category II*[3] ..... | - | - | - | - | *35,433,454* |
| *Memorandum item:* | | | | | |
| Global S.W.I.F.T. traffic ..... | 255,142,610 | 298,780,982 | 332,895,932 | 365,159,291 | 405,540,962 |

[1] Data for the United States and Puerto Rico. [2] Category I: customer (funds) transfers. [3] Category II: bank (funds) transfers.

*Source*: S.W.I.F.T.

**Methodology and sources for the compilation of Tables 12 and 13**

The data were taken directly from the sources cited in the footnotes. In some instances, estimates were made using data available to the Federal Reserve as a processor of payments. "On-us" transactions are included for cheques and credit cards; however, such transactions are not included for credit and debit transfers made through automated clearing houses and POS terminals.

# CROSS-BORDER

## PAYMENT SYSTEM ARRANGEMENTS

# Table of contents

## INTRODUCTION

The previous chapters provide a description of payment systems in individual G-10 countries. This chapter looks at specific developments in international payment system arrangements. Although international payments may ultimately be reflected in transactions within domestic systems, they also have their own characteristics.

This chapter first gives a brief general outline of the structure of international payments as compared with the structure of domestic payment systems described in the individual country chapters. This is followed by several sections devoted to concrete developments in cross-border retail and wholesale payment system arrangements and in international securities settlement arrangements. Some of the sections in this chapter are based on similar sections in the reference work on "Payment Systems in EC Member States", published by the Committee of Governors of the Central Banks of the Member States of the European Economic Community in September 1992.

## 1. GENERAL FEATURES OF CROSS-BORDER PAYMENTS

### 1.1 Traditional correspondent banking relationships

As in the case of domestic payment arrangements, cross-border payments involve a variety of payment intermediaries, monetary assets, legal and regulatory arrangements and communication channels. The added complexity is that typically more than one geographical area or jurisdiction is involved as well as, in some cases, multiple currencies. One general feature is that non-resident banks do not generally participate directly in domestic interbank funds transfer systems and do not normally hold accounts with the national central bank. Therefore payments in any particular currency tend to be executed via banks located in the country of issue. Individuals and firms may, in principle, be able to use foreign currency transactions accounts with a bank abroad to effect their payments in that currency. It is more likely that they will rely on the international payment services offered by their domestic banks, which in turn will make use of their own branches or subsidiaries or of correspondent banking relationships abroad to execute cross-border transactions. Instead of an overarching global settlement system the linkages between the various domestic systems occur primarily at the level of the banking system by way of correspondent banking relationships.

The growth in cross-border payment transactions in recent years and the costs resulting from the complexity of constructing indirect linkages between payment systems in different countries have resulted in a continuing search for cost-effective ways to execute cross-border payments. With regard to retail payments, for instance, where the cost of processing often represents a much greater proportion of the amount paid than in the case of transactions involving large amounts, alternative arrangements are being developed. This process is reinforced by the European Commission's involvement in payments within the EC (a number of developments are discussed in greater detail in Section 2). In the case of large-value payments, market solutions include the development of cross-border and multi-currency netting schemes (see Section 3).

All the financial institutions involved in executing cross-border payments are linked by a series of communication networks which may be operated by the PTT authorities, by the banks themselves (proprietary networks), central banks or other suppliers of telecommunication services such as the Society for Worldwide Interbank Financial Telecommunication (S.W.I.F.T.).

The various networks carry instructions to send or receive payments through the relevant domestic payment systems, to buy or sell securities, or to carry out a range of other financial transactions. Banks are becoming increasingly dependent on automated interfaces with these networks, to handle and pass on incoming payment instructions. Thus a bank which receives a S.W.I.F.T. payment message from an overseas correspondent may automatically convert it into a local

payment message and send it on to another bank through a domestic large-value transfer system. The latter bank may in turn automatically generate an onward message advising its customer of the receipt so that the customer can in turn initiate an onward payment. All these processes can take place within a short space of time and without manual intervention.

## 1.2 Global interbank communication systems: the role of S.W.I.F.T.

### *1.2.1 The organisation*

The Society for Worldwide Interbank Financial Telecommunication (S.W.I.F.T.) is a private company, created in Belgium in 1973, which engages in the transmission of financial messages for the benefit of its shareholding member banks and of other approved categories of financial institutions. The S.W.I.F.T. group is also involved in the development and marketing of specific network applications and in research, development, marketing and sales of terminals and related software. S.W.I.F.T. is a cooperative company owned by 2,074 banks worldwide.[1] It fully owns S.W.I.F.T. Service Partners sa (SSP) and S.W.I.F.T. Terminal Services sa (STS), two limited liability companies also incorporated in Belgium, as well as a number of subsidiaries in other countries and a reinsurance company in Luxembourg, through which part of the Group's insurance is placed.

S.W.I.F.T. transmits financial messages between the 3,582 financial institutions connected to the company's proprietary network which covers 88 countries. While access to the network has traditionally been restricted to S.W.I.F.T.'s shareholding members and their subsidiaries (sub-members) - all of whom are banks - a number of so-called participants have been allowed to use it since 1987 (at the end of 1992 there were 91). These participants include securities brokers and dealers, investment management institutions and various other institutions mostly in the securities business, such as Euroclear and Cedel. Domestic clearing institutions are also accepted as participants. Participants are not shareholders in S.W.I.F.T. and their message traffic over the network is restricted. Some categories of participants may, for instance, neither send nor receive certain types of messages, while other categories may exchange specific messages with their banks (e.g. payment messages), but not with each other.

### *1.2.2 Basic services*

The core service offered by S.W.I.F.T. consists of handling the exchange of financial messages over its proprietary network (composed of computer facilities, switching equipment, leased lines and related software). The network functions comprise the acceptance, validation, storing and delivery of messages. The network, which is accessible 24 hours a day, seven days a week, handled a total message traffic of 405 million in 1992 or an average of about 1.6 million per business day. These messages are highly structured and cover a wide range of banking and other transactions such as payment orders, foreign exchange confirmations and securities deliveries. There are nine categories of banking message covering about 140 message types, each designed to meet specific data requirements of the transactions involved. S.W.I.F.T., with its members, is active in enhancing existing message text standards and developing new standards, for the benefit of all network users. Thus, for instance, S.W.I.F.T. has developed Bank Identifier Codes (BIC) which amount to a universal standard for identifying financial institutions in telecommunication messages. S.W.I.F.T. is also actively involved in drawing up EDIFACT standards for financial messages.

To ensure confidentiality, each message is automatically encrypted by S.W.I.F.T. when it enters the network while users have the option to encrypt the message flow between their in-house terminals and their S.W.I.F.T. access point. Each message also contains an authenticator which

1 All figures in this section relate to the end of 1992 or to the year.

permits the identification of the sender and receiver and which guarantees that the message text has not been modified during transmission. Authentication is based on a common algorithm provided by S.W.I.F.T. and on bilateral keys, known only to the sending and receiving pair of users. The network's operating system generates a broad range of automatic reports on individual users' message traffic, for instance relating to undelivered messages, but users may also request special reports, such as terminal error reports and delivery status reports.

S.W.I.F.T. accepts a contractual responsibility and associated financial liability in respect of the carriage and delivery of messages. The rules governing the use of the system and the company's responsibility and liability are set out in the S.W.I.F.T. users' handbook, and are contractually binding on every member and participant. They spell out some of the responsibilities of the originating and receiving banks, and of S.W.I.F.T. itself, in respect of the timely transmission and handling of payment orders and other financial messages. The rules are often taken as a reference source for correspondent banking relationships.

### *1.2.3 Traffic size*

Statistics on the geographical breakdown of S.W.I.F.T. users and of message flows over the network are shown in Tables 1 and 2. This shows a strong presence of the G-10 countries in the S.W.I.F.T. user community. Banks in the G-10 countries generate almost three-quarters of the traffic over the network and hold the major part of the shares in the company - with the banking community of the United States holding about 15%. (Individual members' shareholdings in S.W.I.F.T. are a function of their share in message traffic over the network.)

With respect to message traffic, the S.W.I.F.T. network may be used for cross-border and internal domestic transactions involving member banks or participants. The proportion of domestic traffic in the total varies considerably from country to country, partly depending on the rules of the national telecommunications authority and partly on the types of alternative interbank telecommunication facilities available. Among G-10 countries, Canada and France generate the largest proportion of domestic traffic in relation to their total traffic. In the case of France this reflects the fact that the SAGITTAIRE system uses S.W.I.F.T. as a message carrier.

### *1.2.4 Value added services*

In addition to the basic service, S.W.I.F.T. provides application and processing services to groups of banks engaged in particular activities. One so-called value added processing service relates to the ECU Banking Association's private ECU clearing and settlement system, described elsewhere in this chapter, for which ECU payment messages between the Association's members sent over the network are copied and forwarded to a central ECU netting computer. Another service, called Accord, was introduced in 1990. It is a computerised system for the automatic matching of foreign exchange and money market deal confirmations sent through the S.W.I.F.T. system. In 1991 the Accord service was extended to include an advisory bilateral foreign exchange netting service: payment information from matched confirmations is extracted to provide statements of bilateral net positions, which subscribers can use in the implementation of bilateral netting agreements. Both the ECU netting and Accord services are supplied by S.W.I.F.T. Service Partners (SSP), with the messages carried by the network.

In 1991 S.W.I.F.T. announced a new service for its members and participants - Interbank File Transfer (IFT). This allows bulk data to be sent across the network, for example reports between branches of the same bank, or batches of low-value payment orders. For the latter application (Mass Payments Facility), a bulk payments format has been devised, generic enough to allow receiving banks to input the instructions into their domestic automated clearing house(s). In the long term, the IFT facility will also be used to exchange EDI messages, using EDIFACT standards.

Table 1

**Geographical breakdown of S.W.I.F.T. message flows in 1992**

| Country or region | Messages sent | | | Messages received | | |
|---|---|---|---|---|---|---|
| | Total (thousands) | To domestic users (% of total) | To other G-10 countries (% of total) | Total (thousands) | From domestic users (% of total) | From other G-10 countries (% of total) |
| Belgium | 18,097 | 16.1 | 66.1 | 15,087 | 19.4 | 59.7 |
| Canada | 9,200 | 30.5 | 52.5 | 8,542 | 32.9 | 52.2 |
| France | 30,311 | 31.0 | 52.0 | 28,460 | 33.0 | 49.6 |
| Germany | 32,585 | 17.0 | 53.1 | 44,888 | 12.3 | 58.3 |
| Italy | 21,144 | 16.4 | 62.0 | 20,009 | 17.3 | 59.8 |
| Japan | 17,795 | 13.3 | 54.8 | 17,245 | 13.7 | 55.1 |
| Netherlands | 13,548 | 13.0 | 69.4 | 12,866 | 13.7 | 69.7 |
| Sweden | 7,089 | 14.0 | 55.1 | 5,880 | 16.9 | 48.9 |
| Switzerland | 28,835 | 17.3 | 63.8 | 25,805 | 19.3 | 61.8 |
| United Kingdom | 48,168 | 24.0 | 54.6 | 42,182 | 27.4 | 50.6 |
| United States | 64,993 | 16.9 | 44.7 | 70,982 | 15.4 | 50.0 |
| **Total G-10** | **291,765** | **19.4** | **54.8** | **291,944** | **19.4** | **54.7** |
| **Total non-G-10** | **113,776** | **17.9** | . | **113,597** | **17.9** | . |
| **Total all countries** | **405,541** | **19.0** | . | **405,541** | **19.0** | . |

*Source*: S.W.I.F.T.

Table 2

**Relative share of G-10 countries in S.W.I.F.T. traffic, membership and shareholding in 1992**

| Country or region | Share of messages | | Share of total | | Share of equity holding |
|---|---|---|---|---|---|
| | sent | received | members | users | |
| Belgium | 4.46 | 3.72 | 1.68 | 1.95 | 3.96 |
| Canada | 2.27 | 2.11 | 0.72 | 1.12 | 2.74 |
| France | 7.47 | 7.02 | 5.26 | 5.12 | 9.27 |
| Germany | 8.04 | 11.07 | 7.33 | 6.10 | 8.97 |
| Italy | 5.21 | 4.93 | 9.06 | 5.59 | 6.32 |
| Japan | 4.39 | 4.25 | 5.40 | 4.94 | 5.36 |
| Netherlands | 3.34 | 3.17 | 1.40 | 1.41 | 4.57 |
| Sweden | 1.75 | 1.45 | 0.53 | 0.51 | 2.29 |
| Switzerland | 7.11 | 6.36 | 5.64 | 4.59 | 8.76 |
| United Kingdom | 11.88 | 10.40 | 2.75 | 7.56 | 8.90 |
| United States | 16.03 | 17.50 | 7.43 | 10.74 | 14.92 |
| **Total G-10** | **71.94** | **71.99** | **47.20** | **49.63** | **76.06** |
| **Total non-G-10** | **28.06** | **28.01** | **52.80** | **50.37** | **23.94** |

*Source*: S.W.I.F.T.

Finally, through its second major subsidiary, S.W.I.F.T. Terminal Services (STS), S.W.I.F.T. supplies specialised hardware and software to its members for handling their message traffic. STS also provides computer-based training programmes for S.W.I.F.T. users.

### *1.2.5 Nature of S.W.I.F.T. messages*

A S.W.I.F.T. message containing a payment order is different from the electronic messages that pass through domestic large-value funds transfer systems because the S.W.I.F.T. payment order does not, by itself or under S.W.I.F.T. rules, create an irrevocable obligation on the part of the sending bank. Financial institutions exchanging S.W.I.F.T. messages have to arrange the clearing and/or settlement of the incoming payment orders themselves, either by relying on bilateral correspondent relationships which they have with one another or by forwarding incoming orders to domestic interbank funds transfer systems. However, an increasing number of major banks have introduced "straight-through processing", in which there is an automated linkage between their S.W.I.F.T. connection and their computer systems linking to the domestic payment system. Banks are also increasingly tending to treat an incoming S.W.I.F.T. payment order as authoritative, particularly if it includes the beneficiary's account number. Although these automated links will normally include, as in the case of manual procedures, internal mechanisms for controlling banks' exposure to their correspondents and customers, S.W.I.F.T. is often an integral part of interbank funds transfer arrangements, especially those handling internationally related payments. Furthermore, where S.W.I.F.T. messages are sent or copied to clearing houses or netting providers, as in the case of SAGITTAIRE in France or the ECU clearing and settlement system, they are the backbone for the particular funds transfer systems involved. The technical standards set by the S.W.I.F.T. community for international financial transaction messages - including those drawn up in cooperation with international bodies such as ISO and with EDIFACT - are increasingly used by outside organisations and may also set the norm for many countries' domestic financial messages.

## 1.3 Cross-currency settlement risk[2]

The settlement of cross-border transactions currently raises significant risk concerns owing to the very large daily values involved, the lack of simultaneous delivery of currencies and the interdependencies of payment system participants throughout the world. BIS estimates indicate that global foreign exchange market activity alone amounted to about $880 billion per day in April 1992. The settlement flows resulting from these and other international transactions represent a sizable share of the daily turnover in many home-currency payment systems.

From the point of view of overall credit and liquidity risks in making and receiving cross-border and multi-currency payments and counter-payments, current national interbank funds transfer systems have two related characteristics that may complicate the management of risks. The first is a constraint in some national systems on when during a payments system operating cycle transfers can be initiated and on when they are final. The second is a constraint on the hours of operation of payments systems themselves, which in turn implies a constraint on the times of day at which final transfers can be initiated and completed. Both of these restrictions limit the possibility of simultaneous exchanges of currencies through national payments systems. Given such constraints, the sequential settlement of most currencies is inevitable. The only issue from the standpoint of credit and liquidity risk is how to manage and reduce those risks.

There are a variety of operational and financial structures for large-value transfer systems in the G-10 countries. As explained in the country chapters, significant changes are also under way.

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2 The following paragraphs are taken from the Report on Central Bank Payment and Settlement Services with respect to Cross-border and Multi-currency Transactions, prepared by the Committee on Payment and Settlement Systems of the central banks of the Group of Ten countries, BIS, Basle, September 1993.

The structures, along with relevant payments and insolvency law, determine the timing of the finality of transfers effected using these systems.

The chart provides summary information on the large-value transfer systems in the G-10 countries. In addition to indicating whether a system is a gross real-time transfer system or a netting system, it shows the hours of operation of the systems, the timing of settlement finality and the cut-off times for third-party transfers. It appears that, in a few countries, it is not possible at the present time to obtain intraday finality of payments via those countries' large-value transfer systems. It is also clear that there is little or no overlap in the operating hours of key transfer systems used for settling foreign exchange transactions in several of the major currencies. Thus it would be difficult if not impossible to conduct simultaneous settlements for several major currencies over national large-value systems under present conditions.[3]

Moreover, if suggested rules governing cut-off times for international correspondent transfers are followed, the apparent overlap in operating hours between some European and North American large-value transfer systems would disappear for the purposes of processing correspondent payments. Even if suggested rules governing cut-off times for international correspondent payments are not followed in practice, cut-off times for all third-party transfers on some systems are likely to limit further the effective degree of overlap in processing hours among key transfer systems.

The risks raised by the asynchronous settlement of foreign exchange transactions were highlighted in July 1974, when Bankhaus Herstatt, a relatively small German bank very active in foreign exchange dealings, was ordered into liquidation by the German banking supervisory authorities, thereby suspending all payments. The suspension and related announcement took place after the closing of the interbank funds transfer systems in Germany so that all of Herstatt's Deutsche Mark payments were already final, but before its US dollar obligations were to be settled on CHIPS. As a result of its failure, Herstatt did not complete the payment to its counterparties in US dollars and a number of them faced the prospect of losses as a result of the asynchronous settlement of funds.

Despite the fact that average exposures in 1974 were much smaller than at present, the episode caused great disruption to the interbank funds transfer system in the United States and in particular to CHIPS. The disruption was related, in part, to declining confidence in counterparties generally. It was only with great difficulty that normal interbank payment flows were re-established. Creditors did in the end receive partial compensation for the losses suffered, but the episode illustrated how uncertainty regarding the size, distribution and resolution of exposures might lead to a broader financial crisis.

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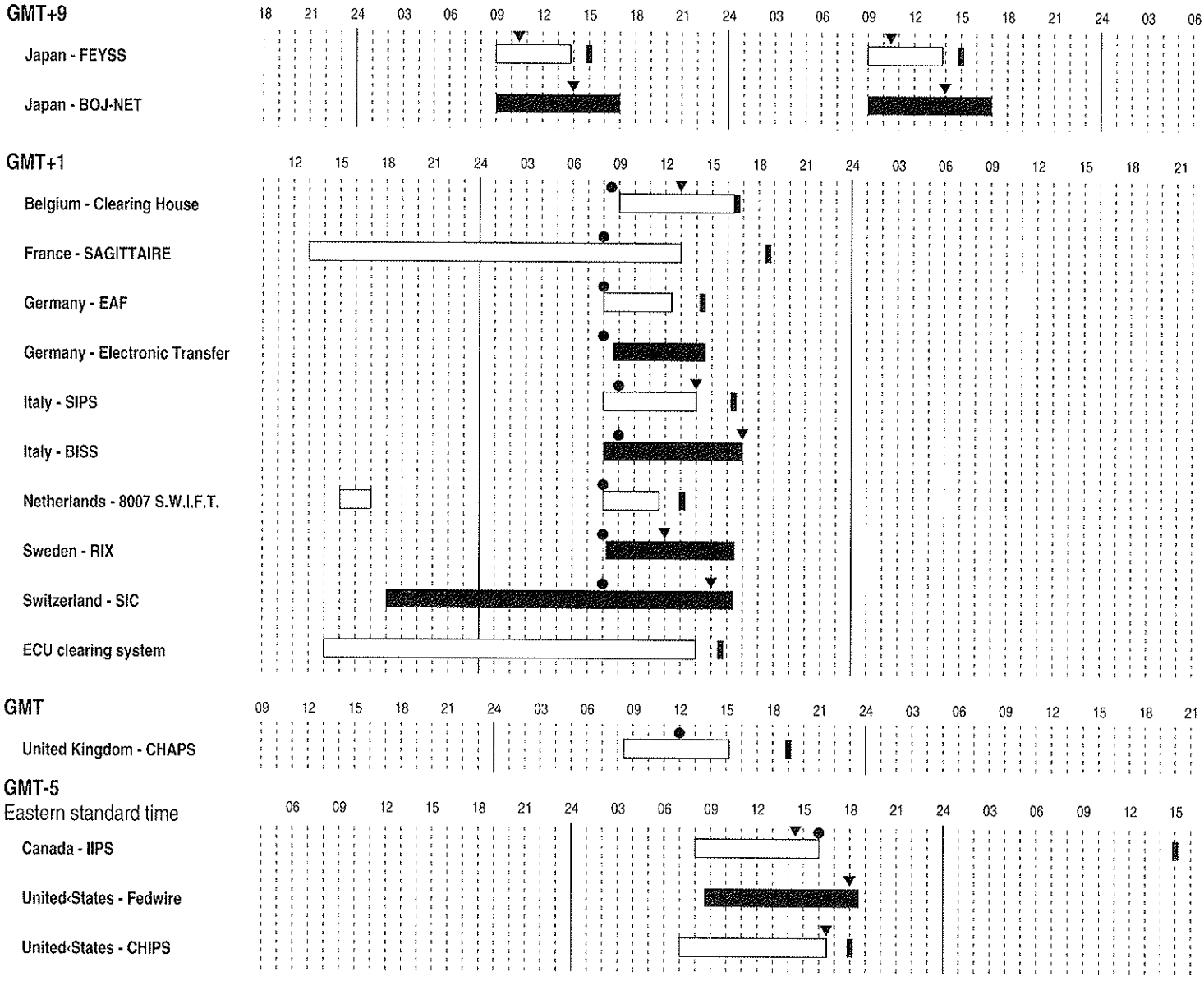
3 The time-lag can be particularly long in a yen/dollar transaction. Assuming that the counterparties obtain final funds only at the end of the opening hours of the interbank systems handling yen and US dollars (typically FEYSS and CHIPS), the party giving up the yen pays out the funds at least 15½ hours before receiving the dollars. In the case of a Deutsche Mark US dollar exchange, the time-lag is still about ten hours.

# Global time zone relationships: Opening hours of selected large-value interbank transfer systems

For same value day *




Opening hours of net settlement system (settlement finality indicated).

Opening hours of gross settlement system (intraday finality indicated).

● Cut-off time for international correspondents' payment orders where applicable (in most cases guidelines only, may be later in practice).

▼ Cut-off time for third-party payment orders where applicable.

* The diagram shows the opening hours, as of August 1993, of selected interbank funds transfer systems as they relate to the same value day; some systems, including SAGITTAIRE and the ECU clearing system, may accept payment orders for a number of value days. As indicated, some systems open on the day before the value day. For Canada, settlement finality for IIPS occurs on the next business day, with retroactive value dating. Precise information on opening hours and cut-off times is provided in the comparative tables in the annex. For FEYSS, Fedwire and CHIPS, the cut-off time for third-party and international correspondents' payment orders is the same.

# 2. CROSS-BORDER RETAIL PAYMENT SYSTEMS

## 2.1 Europay

### *2.1.1 The organisation*

Europay International S.A. was created in Belgium on 1st September 1992 as a result of the merger between Eurocard International, eurocheque International and eurocheque International Holdings. The national Eurocard, eurocheque or Europay companies, established in Europe, as well as some other payment systems companies, banks and banking associations are shareholders in Europay International. The principal shareholders, which together represent over 50% of the shares, are the Payment Systems Company GZS (Germany), Europay France (France), MasterCard/Europay UK (United Kingdom) and MasterCard International (United States).

Europay owns, manages and licenses international retail payment system brands and manages an international telecommunication network and processing centre. Europay is managed by an international Board of Directors. The main Board is the only decision-making body together with the Shareholders' Assembly. Regional boards - representing smaller shareholders - are involved in preparing the main Board meetings.

### *2.1.2 The services*

The integrated Europay company offers a range of cashless payment services called "Europackage", which covers three segments known as "pay before", "pay now" and "pay later". In each segment of the Europackage one or more products are available - in many cases in a "Europe-only" and/or a worldwide acceptance version.

#### *(a) Pay before: travellers' cheques*

Strictly speaking, Europay International has no activity in this area yet. Agreements on the issue of Euro travellers' cheques have been reached between Euro Travellers Cheque International, MasterCard and the Thomas Cook group.

#### *(b) Pay now: cheque guarantee cards, cash dispenser cards and debit cards*

The eurocheque system was the first building block in the "pay now" segment. In 1968 this system was established to replace the numerous individual bilateral cheque encashment arrangements that existed between banks in Europe. The primary aim was to provide a uniform cash advance service in bank branches abroad, based on the cheque and the guarantee card. In 1972 uniform eurocheque standards were introduced, thus allowing the extension of the service to retailers, as these cheques could be issued in the currency of the country visited, and not just in the home currency. In 1981 eurocheque's Package Deal Agreement enabled retailers in more countries to accept eurocheques and to rationalise international clearing (see below). In 1984, ATM functionality was introduced to the eurocheque cardbase, uniform standards agreed for ATM use and the first European cross-border ATM network was established.

More recently, an agreement with Cirrus provided new opportunities for European banks to enhance their ATM services by adding a worldwide cash access utility to eurocheque cards and proprietary ATM, electronic debit and cheque guarantee cards. (Cirrus is a US-based international ATM network owned by MasterCard.)

The latest development within the "pay now" segment, is the edc/Maestro POS service. Eurocheque cards, as well as proprietary bank cards, will be usable in POS networks all over Europe

through this service. Additionally, they may be used worldwide via Maestro, the global debit service developed jointly by Europay and its partner MasterCard.

### *(c) Pay later: credit cards*

Under the Eurocard/MasterCard marks, a range of credit/charge card facilities are available. These include: the Mass Card (a personal credit or deferred payment card for everyday use); the Charge Card (a general purpose product with worldwide payment utility and an above average spending facility for personal use); and a Business Charge Card.

All Eurocard/MasterCard cards are accepted globally at nearly 10.6 million merchant outlets in 220 countries and territories and have access to a global ATM network of more than 124,000 machines (see also Table 3).

Table 3

**Key figures of the Europay system** (end-1992)

| | |
|---|---|
| Eurocheque cardholders | 51,709,157 |
| Eurocard/MasterCard cardholders | 28,988,985 |
| Eurocheque ATMs | 52,714 |
| Eurocard/MasterCard ATMs | 52,994 |
| Cirrus ATMs | 14,245 |
| Eurocheque merchant outlets | 5,000,000 |
| Eurocard/MasterCard merchant outlets | 2,413,493 |
| Value of transactions in 1992 | ECU 170 billion |
| *of which: cross-border* | *ECU 15 billion* |

## *2.1.3 Technical, organisational and clearing aspects*

### *(a) Data transmission*

Most international transactions with Europay products are serviced through EPSS (European Payment Systems Services S.A., Brussels), owned jointly with MasterCard International (15% shareholding). Through its telecommunications network, called EPS-Net, Europay provides the following services: data transmission, authorisations, clearing and settlement and, for eurocheque ATM transactions, a security procedure to counter abuse. National transactions use various national communication networks, which are linked to the international communication networks. Both leased links and public switching links are used; the choice between the two mechanisms depends on volume and economic considerations.

EPSS enables data to be exchanged between the acquirer and the issuing bank. Each working day, all international Europay transactions (including transactions reported by MasterCard from St. Louis (USA)) are routed from the trader's bank directly or indirectly to Europay International.

### *(b) Authorisation*

The issuer of the different Europackage products basically chooses the method of authorisation which he wants for the particular product. This can be the so-called "on-line to issuer method" or the "stand-in system", whereby Europay does the authorisation. On-line authorisation to acquirer is no longer supported.

### *(c) Clearing and settlement procedures*

In order to establish a full international payment system for the eurocheque, two basic agreements have been introduced to rationalise clearing procedures for "pay now" products:

- The Package Deal Agreement (PDA), introduced in 1981, contains the following elements:
  - no deduction of commission by the retailer or the acquiring bank;
  - cheques denominated in local currency both at banks and at retail outlets;
  - centralised clearing procedure (in theory, one centre per country);
  - maximum commission (Interbank Remuneration) charged to the issuing bank as remuneration for the services provided by the acquiring bank;
  - guarantee up to the countervalue of ECU 170.
- The Agreement for Simplified Clearing for encashing countries (for countries where the previous agreement did not apply) is based on the following elements:
  - no deduction of commission at the time of encashment;
  - cheques written in foreign currency;
  - centralised clearing procedures;
  - uniform commission.

Clearing is done via eurocheque Clearing Centres (eCCs) if the acceptance requirements of the eurocheque clearing system are fulfilled. For operations above the maximum clearing amount (currently ECU 1,000) and for countries where no agreements apply, traditional correspondent banking procedures are followed.

The PDA was operational until 1992, when Europay was founded. It is still valid for all countries which signed it between 1981 and 1992. However, any new country opening up to eurocheque is now asked to sign the Simplified Clearing Agreement, which was originally drawn up for encashing countries only.

Europay aims to establish by 1994 a single licensing structure for all its products, including eurocheque. This will substitute for the PDA and similar agreements.

In the past, settlement of international eurocheque transactions between countries took place exclusively on a bilateral basis. The issuer countries held accounts in the acquirer countries in acquirer currency. The Acquirer eurocheque Clearing Centres (AeCCs) were authorised to debit loro accounts on the due value date. Owing to the number of countries involved, numerous loro accounts had to be kept by each Issuer eCC. Clearing data were exchanged directly between the Clearing Centres, either as cheque remittances or as electronic data for ATM transactions and truncated cheques. For this latter purpose, a store and forward function has been available centrally at Europay International, on EPS-Net.

Since April 1993, the first eurocheque members have switched to net settlement (see below), and all should have migrated to the new system by end-1994.

The physical cheque batches are still processed and dispatched to each Issuer eCC in the same way as in the past: cheques can be physically mailed or electronically captured with cheque reading equipment. The electronically captured clearing data are then transmitted via a data communication link or mailed on a tape directly to the issuing eCC. If legally permitted, cheques can be stored in the acquiring country (cheque truncation).

For eurocheque paper cheque and ATM members without access to the standard clearing and settlement system only, a special interface called the EAP (Evans Access Point) has been developed in order that daily remittance totals can be entered for net settlement. These EAPs will be installed at the appropriate Clearing Centres.

Under the new Net Settlement Service, cross-border transactions related to all products are centralised at Europay International, where they are sorted and aggregated for each card-issuing institution. Claims and liabilities are then offset and the net balance is calculated for each institution (multi-currency multilateral netting with one single cut-off time each day). Foreign exchange operations are limited to those necessary to settle this net balance. Commerzbank, with which all participants hold an account, acts as settlement institution.

#### *(d) Fees*

Regarding "pay now" products, the maximum interbank remuneration for cheque collection is a percentage of the value of the cheque (with a flat fee on cheques issued below a certain amount). For card-based ATM transactions, the maximum interbank remuneration basically consists of a fixed fee per transaction with a supplement of a relatively low percentage of the transaction amount.

With respect to "pay later" products, an interchange fee - a percentage of the transaction amount - is paid by the acquirer to the issuer for retail transactions. For manual cash advance and ATM transactions, an interchange fee - various formulas exist - is paid by the issuer to the acquirer.

### 2.2 VISA International

#### *2.2.1 The organisation*

VISA is an international association with 19,000 members located in Asian-Pacific countries, Canada, Europe, the Middle East, Africa, Latin America and the United States. Membership is limited to deposit-taking financial institutions and to bank-owned organisations operating in the bank card sector, such as Servizi Interbancari in Italy and Carte Bleue in France. VISA is managed by an international board and five regional boards with decision-making powers for their geographic areas.[4] Decisions relating to telecommunications, operational standards and the development of payment services are made centrally by VISA International. The five regional boards have full autonomy in defining commercial policies, promoting VISA products and establishing conditions of payment for purchases.

#### *2.2.2 Major services*

VISA supports paper-based, smart card, electronic, on-line and off-line systems. Its principal services are credit cards and travellers' cheques and the authorisation, clearing and settlement of the related transactions. In 1992 there were 340 million VISA cards in circulation that could be used for purchases at 10 million locations in 250 countries and cash advances at 260,000 member

4 (1) Asia-Pacific, (2) Canada, (3) Europe, Middle East, Africa (ERMA), (4) Latin America and (5) United States.

branches and 130,000 ATMs in sixty countries. The total value of purchases made with VISA credit cards in 1992 was $460 billion; the value of VISA travellers' cheques sold was $17 billion.[5]

#### *(a) Authorisation*

Authorisations and clearing of transactions are carried out through the VisaNet communications and data-processing network, which operates worldwide and links the computers of the member banks with VISA Interchange Centres.[6] The VISA authorisation service operates 24 hours a day worldwide for authorisation between the issuing bank and the bank of the commercial outlet.

#### *(b) Clearing and settlement*

This service enables each member bank to acquire, in electronic form, information concerning customer transactions and to transfer to other VISA members the funds they have advanced to the commercial outlets in connection with those transactions. These flows of information are transmitted in batches overnight, in contrast to the authorisation service, which operates in real time. The system operates six days a week, covers 25 currencies and calculates net balances for individual associates. VISA bills in 165 currencies and clears and settles in 25. Currency conversion is handled through trading banks located in each of the 25 settlement currency countries, which operate through a lead trading bank.[7]

### *2.2.3 Other services*

VISA also offers ACH, POS and ATM services. The ACH service is only available in the United States. The POS service is either off-line through the VISA Debit Card, which has a built-in three-day float period, or on-line through the Interlink system, which is available only in the United States. VISA's ATM service is available worldwide through its VISA/Plus cards.

## 2.3 MasterCard International

MasterCard is a global payment services franchise comprising over 29,000 member institutions. The member-owned association does not issue cards, set card fees or establish cardholder annual percentage rates. MasterCard does not solicit individual merchants to accept the card or set discount rates.

In its worldwide payment services role, MasterCard sets and enforces policies and rules to support its brand name along with developing new products and services. It establishes standards and procedures under which acceptance and settlement of cardholder and service subscriber's transactions are conducted between MasterCard and its global members and provides a communications network for its members, facilitating the electronic authorisation of debit and credit card transactions and the clearing and settlement that takes place between them.

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5 Visa International, 1992 Annual Report.

6 The Interchange Centres are located in London, England and McLean, Virginia, USA.

7 Members in the European region, for example, settle their balances through accounts held at a London bank or with its correspondents. Members in the US and Canada settle through their accounts either through correspondents under agency agreements with the issuing banks or directly with Visa through accounts maintained at a Visa settling bank.

### *2.3.1 Authorisation*

Authorisations of MasterCard transactions are routed through the Banknet communications and data-processing network. The network is owned and managed by MasterCard International and connects the host computers of the member banks to each other as well as to the MasterCard global processing centre. While centrally controlled in St. Louis, Missouri, the management of the network operations provides distributed authorisation information for global member issuers' prior approval of cardholder or other service subscribers' payment obligations. The backup facility is located in Lake Success, New York. The MasterCard authorisation service operates 24 hours a day, 365 days per year, for authorisation between the issuing bank for the cardholder or service subscriber and the bank responsible for the merchant or commercial vendor. The authorisation system has been upgraded continually to support debit transactions and ATM activity on a global level through the Cirrus affiliation and Europay International relationships.

### *2.3.2 Clearing*

The MasterCard clearing system supports the exchange of electronic transaction data between the acquiring member bank and the issuing member bank. The required transaction information is exchanged on the basis of a predefined data format established by MasterCard International. The system handles information in batch format and establishes end-of-day reconciliation cut-offs six times per week.

Each daily reconciliation cut-off consists of three clearing cycles. The individual clearing cycles establish interim totals of transaction data available to the issuing members based on data submitted by acquirers during the cycle. The third and final clearing cycle is used to establish the end-of-day processing for the preparation of daily member net settlement files and reconciliation. Each transaction is priced according to rules established by the association. The resulting net dollar value, based on multi-currency official mid-rate conversions of all acquired transactions, is logged and sorted by card issuers for calculating settlement balances. The data files, under strict security control, are electronically transferred to the settlement system following appropriate review to ensure that member due to/due from positions are balanced. The release is completed every US banking business day morning to facilitate member funds settlement process initiation.

### *2.3.3 Settlement*

The settlement process consists of compiling the aggregate results of the appropriate daily clearing files to determine net due to/due from totals, for all transaction activity denominated in US dollars, for each bank in the system. A MasterCard member will either owe the system or collect from the system. A reconciliation is provided to each member detailing the net amounts by clearing cycle and a total for clearing cut-off. Members receiving or paying US dollars interact with MasterCard's settlement bank through the Fedwire system or maintain accounts directly with the settlement bank. All payments are due on the settlement date.

MasterCard offers non-US dollar settlement to its international members electing to receive or pay in other currencies. These payments are handled through an international settlement bank and payment is made to and from the members on the basis of traditional two-day value dating conventions in the foreign exchange market. MasterCard currently offers non-US dollar settlement to members in eleven countries.

### *2.3.4 Other member support services*

**Member protection programme**. This has primarily involved card technology and authorisation intelligence under the direction of the MasterCard Risk Management Group to give members early warning of fraudulent transactions or questionable cardholder account activity.

**MAPP**. The MasterCard Automated Point-of-Sale Program is an electronic POS transaction processing service enabling acquiring members to offer their merchants cost-efficient and reliable authorisation processing and electronic draft capture for both credit and debit cardholder activity.

**Remittance-processing service**. This is an electronic routing and settlement service that accepts previously captured and authorised payment transactions from members for delivery to other financial institutions and posting to biller/merchant customer accounts.

**Member settlement risk management**. This is a key function dedicated to evaluating members' financial creditworthiness and compliance with established settlement risk standards. The review process for new members and ongoing monitoring of all members is applied to both issuing activity and acquiring merchant relationships. Based on settlement activity risk and country exposure analysis against regulatory capital standards, security arrangements of escrow funds or reliable third-party guarantees are required for acceptance or continued involvement in MasterCard's settlement process.

## 2.4 Other developments

### *2.4.1 Developments in the European Community*

Stimulated by the creation of the single market, the importance of retail payments between EC member states is expected to grow. At the moment their volume, compared with domestic payments flows, is rather small.[8] From the point of view of the EC Commission, the processing of cross-border payments should be as efficient as in the national payment systems. In February 1990 the Commission recommended that every supplier of payments services should provide customers with transparency regarding the cost and the execution time of a payment and with the possibility of transferring the whole amount due to the payee without "double charging". This was followed by a thorough review of existing systems. The report of September 1990 "Making payments in the Internal Market" (the so-called "Green Paper") contained a survey of the most important cross-border payment systems and media, criteria for assessing their efficiency and suggested options for improvement.

Two working groups of the Commission dealt - inter alia - with the issue of linking existing domestic payment systems. Their work led to a report published in 1992 entitled "Easier cross-border payments; breaking down the barriers". Essentially, this was a working programme for the improvement of cross-border payment systems in terms of transparency, reliability, speed and cost. Attached to this document was a set of guidelines elaborated by the three main European credit sector associations, to be followed by banks in providing customers with the relevant information concerning the methods of making remote payments and their respective cost, timing and other essential conditions.

The Commission has encouraged the organisers of payment systems to provide rapid and cheap cross-border funds transfer facilities for, in particular, individuals and small and medium-sized businesses. Some of the systems which currently offer or plan to offer such services are presented below. Instead of processing payments transaction by transaction, as in traditional correspondent banking, they transmit them in batches to the foreign correspondent, who channels them into the domestic payment systems and automated clearing houses.

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8 Figures provided by the European Banking Federation for 1991 show that total retail cross-border payments represent about 1.3% of domestic payments in EC countries taken as a whole.

### *(a) TIPA (Transferts Interbancaires de Paiements Automatisés)*

In 1991 "TIPA", a cooperative under Belgian law, was founded in Brussels by a number of cooperative banks. Since 1992 it has provided a network for processing cross-border payments between participants via national ACHs, where the payment information together with the amounts are transmitted in batches at the end of the day. The TIPA format is the lowest common denominator of formats used in national ACHs. Batches are transmitted by exchanging magnetic media or via S.W.I.F.T.-IFT, Datex-P or dedicated lines.

Settlement is effected via reciprocal account links. In receiving countries without an ACH, the beneficiary receives a cheque drawn on a specially nominated bank. The execution time depends on the receiving country, but D+4 is aimed for as a maximum. The execution time, as well as all costs involved, are made known to the customer in advance. A flat rate price, covering all the charges of the sending and the receiving institution, is offered. The rate for the currency exchange, which is effected by the sending bank, is also notified to the customer in advance. The system can handle credit transfers, cheques, direct debits and commercial bills, which can be processed automatically, in the currency of either the receiving or the sending country or denominated in ECUs.

The TIPA service is not restricted to cooperative bank customers, but is also open, for example, to small and medium-sized businesses. Beyond the linkages established in the European Community, payments are already sent to Canada and payments from Canada will soon be forwarded. Links with cooperative banks in the United States are under discussion; links have been in place between most EC member states since January 1993 and connections with the remaining major industrial nations were scheduled to be implemented by the end of 1993.

### *(b) EUFISERV (European Savings Banks Financial Services Company)*

EUFISERV is a company under Belgian law offering financial services. In 1990 it was founded in Brussels by savings bank associations of eleven European countries together with the European Savings Bank Association.[9] It operates a network processing the exchange and the settlement of ATM withdrawals on-line via a central switch in Germany. Since a cooperation agreement was signed with VISA in 1992, the system has also handled VISA card transactions. The European savings banks' payment system project for processing mainly cross-border small-value transactions on-line will be based on the same infrastructure.

One savings bank per member country will be the central collecting and receiving agent for cross-border payments. Transactions which are not destined for an individual savings bank, will be channelled into the respective domestic payment system. The customers for whom the service is mainly designed are individuals and small and medium-sized businesses. Two services will be created: bulk credit transfers and direct debits (for commercial customers, e.g. payments of wages); and payments from the savings banks' branch offices (single payments).

### *(c) EUROGIRO*

Since May 1992 the "Eurogiro Network A/S", a limited company under Danish law, has managed the common payment system of fourteen European postal banks, its shareholders.

"Eurogiro", a type of paperless cross-border funds transfer, which may be used for large or small amounts, has been available since 1993 to individuals and businesses holding a postal account. Payments are credited to the beneficiary's account within four working days, a period which

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9 The eleven countries were: Belgium, Germany, Spain, France, Italy, the Netherlands, Norway, Austria, Portugal, Finland and Sweden. The system is not yet operational in all these countries, and will not be restricted to the founding members.

includes the days of debiting and crediting. If the recipient has no postal account, a cheque is sent to him.

Transfer data are sorted according to the receiving countries, where the system aggregates the payment information and the amount and transmits it in batches via an X.25 INFONET network in the afternoon. The amounts are settled each working day via reciprocal accounts.

The cost and the exchange rate of the transfer are made known to the customer in advance. The national postal banks are autonomous in their pricing policy; however, the overheads of the system form the basis of tariff calculation. The possibility of a general pricing scheme is under discussion.

### *(d) ACH-Linkage Feasibility Study Group*

The EC Commission proposed links between automated clearing houses as one option for improving cross-border payment facilities in its Green Paper of September 1990, "Making payments in the Internal Market". This possibility had already been studied by the EACHA (European Automated Clearing Houses Association) in 1989 and found to be technically feasible.

The proposal is that European automated clearing houses should establish links between themselves as one means of processing certain types of cross-border retail payments. Such a system could handle large volumes rapidly and cheaply and would offer an alternative to correspondent banking for smaller banks not willing to create their own system. A working group with representatives of thirteen countries has studied the feasibility of such a linkage and concluded affirmatively. However, the "business case" remains to be established. For the time being, the system is being designed to process cross-border transfers, up to a value of ECU 2,500, in the receiving country's currency. Settlement arrangements remain to be finalised.

In the next stage an ACH linkage should be formed between the Netherlands, Belgium, the United Kingdom, Italy and Germany. With this aim in mind, Belgium's seven biggest credit institutions have founded the cooperative B.EPSYS (Belgian European Payment Systems), which is to become operational before the end of 1993. In Germany, the Payment Systems Company (GZS) has been nominated as the central German ACH for the purpose of the project, and in Italy this role will be played by the Interbank Society for Automation (SIA).

### *(e) Other private initiatives*

In addition to the arrangements outlined above, there has been a steady growth in private initiatives, with varying degrees of automation, designed to provide customers with greater certainty about the cost and the time taken for cross-border payments in Europe. Many of these schemes are based on enhanced correspondent banking relationships. Some concentrate on high-volume, low-value transfers, while others provide a more general service aimed at the personal and corporate customer. A key feature of many schemes is the use of batch transfer of payment instructions to local ACHs and other payment systems. Typically, schemes will involve a limited number of points of entry into each country's local payment systems. Alternatively, both parties to the transaction may be required to hold an account with scheme participants. Some schemes use their own data exchange networks in addition to, or instead of, S.W.I.F.T. and may grant customers direct access to the system via a computer terminal. In some cases, interbank settlement takes place on an end-of-day net basis. The initiatives are based, for instance, on members of the same banking group, a single bank marketing its scheme to its correspondent banks or more informal groupings with multilateral or bilateral agreements on pricing and the time taken for transactions. Examples of such schemes include TAPS (a system managed by the Bank of Scotland), Unitime (Crédit Lyonnais and others) and IBOS (Banco Santander, Royal Bank of Scotland and others).

### *2.4.2 Cross-border remote small-value payments in North America*

In North America certain commercial banks have created proprietary systems to facilitate the flow of small-value payments, such as social security payments, across borders to recipients resident in Canada. One system, for example, is used to move payments from the United Kingdom to Canada via the United States.

In another system the United States has been paying social security beneficiaries resident in Canada via direct deposit into their transaction accounts since 1989. The Federal Reserve transmits the payments to recipients' accounts via US and Canadian commercial banks. Monthly payments valued at US$ 8 million (Can.$ 10 million) are made to 21,000 Canadian beneficiaries.

In addition to Canada, the United States makes monthly cross-border social security payments to recipients in France, Germany, Italy, Norway and the United Kingdom. This programme will be extended to Ireland and Spain in the near future.

Several large Canadian banks and the National Automated Clearing House Association (NACHA) in the United States have formed a Cross Border Council to standardise and promote retail payment flows across the Canadian/US border.

## 3. CROSS-BORDER INTERBANK NETTING AND SETTLEMENT SYSTEMS

### 3.1 FXNET

FXNET is a limited partnership formed under English law and owned by the UK subsidiaries of twelve major banks. It offers a framework for the bilateral netting of spot and forward foreign exchange obligations. It is a decentralised system in which participants use common software, provided by Quotron Foreign Exchange.

Banks in several centres around the world, currently London, New York, Tokyo, Hong Kong, Singapore and Zurich, participate in FXNET, each participant branch being free to negotiate which other participant branches to net with and which currencies to include. FXNET supplies model netting agreements, which pairs of participants may choose to use, but it is each participant's responsibility to obtain independent legal advice as to the effectiveness of these agreements.

Deal confirmation messages are sent by S.W.I.F.T. between participants' FXNET systems. As a deal is matched and confirmed, the obligation to exchange two payments is substituted by an obligation to make a stream of net payments. At a prearranged time of day, the FXNET systems of the two counterparties calculate the net amount due or owed and send messages to this effect to each other. Pairs of netting participants then settle their mutual obligations through normal payment channels.

### 3.2 Multinet

Commercial and investment banks based in Canada and the United States have formed Multinet[10] to clear foreign exchange transactions. Participants match and confirm trades and net foreign exchange contracts bilaterally through a central facility operated by International Clearing Systems, Inc. (ICSI), a subsidiary of the Options Clearing Corporation (OCC). As of September 1993,

10 Previously called the North American Clearing House Organisation, or NACHO.

ten commercial banks and one investment bank were netting bilaterally. The system has been designed to accommodate multilateral netting through a process of novation and substitution.

### 3.3 ECHO (Exchange Clearing House Organisation)

The ECHO Netting project is being developed by a group of international banks for the multilateral netting of spot and forward foreign exchange obligations. Current proposals are that netting will be by interposition of a clearing house, established in London, as the central counterparty to every qualifying transaction entered into by a pair of participants. Participants would also have the option to transact deals without involving the clearing house.

Settlement of net amounts between the clearing house and each participant would take place through normal payments channels. The clearing house would hold nostro accounts with correspondent banks in the country of issue of each of the currencies being netted.

The netting would be based on English contract law and would apply to a number of currencies (twenty-four according to current proposals), provided it satisfied the interested central banks that it met to an adequate degree the standards set out in the 1990 Report of the Committee on Interbank Netting Schemes of the central banks of the Group of Ten countries. It is planned that banks incorporated in any OECD country should be able to participate.

### 3.4 The private ECU clearing system

#### *3.4.1 Origin of the system*

The private ECU clearing and settlement system was developed in order to replace a clearing scheme for the settlement of private ECU balances which had been set up in 1982 by a small group of commercial banks active in the ECU market. This original scheme, known as MESA (Mutual ECU Settlement Accounts), soon proved to be ill-suited to handling the increasing number of ECU payment orders between a growing circle of financial institutions.

In early 1983 the Bank for International Settlements (BIS) was approached by a group of commercial banks with a view to establishing a clearing system for operations in private ECUs. The Committee of Governors of the EC central banks was consulted prior to setting up the present system and, in March 1983, it issued certain guidelines for the operation of the system. These included that the system remained exclusively within the framework of relations between the BIS and the commercial banks and did not conflict with the monetary policy objectives of the countries concerned.

#### *3.4.2 Major participants in the system*

The ECU Banking Association (EBA) is a body formed under French law in September 1985 with headquarters in Paris. Membership is open to commercial banks which have their head office or a branch in one of the EC countries and which demonstrate sufficient interest in the development of ECU transactions; those members which meet certain criteria set forth in the EBA clearing rules may be designated as clearing banks.

The BIS, as agent of the individual clearing banks, acts as the settlement institution for the system. Each clearing bank agrees to maintain an ECU sight account and a clearing account with the BIS. The ECU sight account may only be used for the settlement operations, does not bear interest and may never show a debit balance; as a result, the BIS does not assume any credit risk in the ECU clearing and settlement system.

S.W.I.F.T. Service Partners (SSP), a subsidiary of S.W.I.F.T., acts as the netting centre of the system and provides the data support for the netting stage. (See also Section 1.2.4.)

### *3.4.3 Operating rules of the system*

The netting stage lasts until 2.00 p.m. (Brussels time) every working day. During this period, clearing banks exchange payment orders in ECUs through the netting centre. Immediately after 2.00 p.m., the netting centre determines the preliminary credit or debit balances of each clearing bank, value same day; it then reports all these balances to the BIS and notifies each clearing bank of its preliminary balance.

The borrowing and lending stage begins immediately after the netting stage. In this netting arrangement, where the sum of preliminary debit balances is necessarily equal to the sum of preliminary credit balances, the clearing banks in a debtor position must, in the second stage up to 3.15 p.m., borrow funds from creditor banks in order to reduce their preliminary debit balances to an amount not exceeding ECU 1 million.[11]

Shortly after 3.15 p.m., the netting centre determines the final netting balances, notifies each ECU clearing bank of its own balance and reports all balances to the BIS. These final balances, which take account of all bilateral operations which the clearing banks have been able to conclude with each other between 2.00 and 3.15 p.m., must be confirmed by each bank to the BIS before 3.45 p.m.

If a clearing bank's netting balance continues to show a debit of more than ECU 1 million, the debtor clearing bank must, before 3.45 p.m., require the assistance of the BIS, with a view to borrowing ECUs from other clearing banks to permit the settlement of its final netting balance. Any sum thus transferred constitutes a loan between the banks in question, value the same working day and repayable the following working day. All these transactions bear interest at a fixed rate which is calculated every day by the BIS according to the "tomorrow/next" ECU interest rate, reported to it by the clearing banks on the previous day. At 3.45 p.m. the BIS is normally able to carry out the settlement operations by debiting or crediting the respective ECU sight accounts held in its books with the amounts necessary to square all the corresponding netting balances booked on the clearing accounts. If after 3.45 p.m. a clearing bank is unable to cover its debit position, the BIS may, as far as possible, proceed with the operations authorised by the risk reduction measures described below. If, however, cover cannot be produced, an "unwind" procedure occurs. The entire clearing for that day is then carried over to the following working day: all payments to and by the debtor bank are withdrawn from the day's clearing transactions and new balances calculated and added to the clearing for the following settlement day. This "next day" solution means that beneficiaries of payments would not have good funds until the completion of the clearing the next day. Furthermore, in the event that the BIS for any reason - presumably on technical grounds - is not able to receive notification of all final netting balances from the netting centre, the clearing may have to be cancelled. So far, it has never been necessary to carry over or cancel any clearing.

### *3.4.4 Volume of transactions*

Table 4 shows the expansion of the private ECU clearing system in recent years. At the end of 1992, the system cleared about 6,500 transactions per day among the 44 clearing banks for an amount of about ECU 42 billion.[12]

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11 This remaining position will be then covered during the settlement stage by the transfer of funds, up to ECU 1 million per account, that the BIS is entitled to organise under the terms of the standing transfer order it has received from each clearing bank.

12 A peak was reached in September 1992 when the system cleared an average of almost 7,000 transactions per day for a total average value of ECU 55 billion.

Table 4

**Key statistics relating to the private ECU clearing and settlement system**
(all figures relate to the month of December)

| Year | Number of clearing banks | Number of payments netted during the month | Average daily transactions | |
|---|---|---|---|---|
| | | | volume | value (in billions of ECUs) |
| 1986 | 7 | 33,869 | 1,882 | - |
| 1987 | 96 | 49,098 | 2,455 | - |
| 1988 | 33 | 69,024 | 3,287 | - |
| 1989 | 45 | 76,908 | 4,048 | 23.3 |
| 1990 | 45 | 97,176 | 5,115 | 28.7 |
| 1991 | 44 | 125,521 | 6,276 | 44.0 |
| 1992 | 44 | 142,916 | 6,496 | 41.5 |

*Source*: BIS as Agent for the private ECU clearing and settlement system.

### *3.4.5 Risk reduction measures*

As the private ECU clearing and settlement system is a closed circuit with no scope for injecting same-day liquidity into it after the cut-off time, each participant with a provisional net debit balance can in principle only square its position by borrowing the excess funds from participants with a net provisional credit balance. The successful completion of the clearing each day relies on the willingness of those banks in net credit positions to take on the additional credit risk that results from lending to the banks with net debit positions.

As a first step towards strengthening the settlement arrangements, the BIS, at the request of the EBA, has with effect from 1st August 1991 implemented an "intermediation facility". Under this facility, in the event of a participant with a net credit position being totally opposed to lending its surplus to a participant with a net debit position, then that surplus will effectively be channelled through all the other clearing banks who will each on-lend up to a maximum of ECU 5 million to the "net debit" bank. This arrangement can potentially cover a shortage of ECU 215 million (i.e. 5 x 43).

Measures to strengthen the safety features of the settlement of ECU transactions began to be considered in early 1990. The conclusions of the report of the Committee on Interbank Netting Schemes (the Lamfalussy Report), issued in November 1990, provided additional incentives to implement them. In January 1991, the Committee of EC central bank Governors established an Ad Hoc Working Group on EC Payment Systems, whose mandate included undertaking a thorough review of the ECU clearing and settlement system in the light of the Lamfalussy Report, and in cooperation with the BIS and the EBA.

In May 1992 the Committee of Governors endorsed the conclusions of a report on "Issues of common concern to EC central banks in the field of payment systems", prepared by the Ad Hoc Working Group on EC Payment Systems. These conclusions were divided into four main recommendations, the fourth of which stated that "oversight of the ECU clearing and settlement system should be continued". The detailed analysis supporting this recommendation was set out in a second report to the Committee of Governors in "The Private ECU clearing and settlement system". The Committee of Governors subsequently established the Working Group on Payment Systems (WGPS) with a mandate that includes the task of overseeing, on behalf of the Committee, the ECU clearing system. Based on preliminary findings of the Ad Hoc Working Group, the Committee of Governors in September 1991 asked the EBA to implement without delay certain short-term measures

to improve the system's compliance with the Lamfalussy standards. Specifically, these measures involved the carrying out of a legal and technical audit of the system and the implementation of a system of limits on bilateral and multilateral exposures and of a liquidity-sharing and loss-sharing agreement.

In September 1992, non-binding multilateral advisory limits were introduced to enable the clearing banks to adjust to a limit environment, and to begin to modify their behaviour as necessary.

In June 1993, the clearing banks passed a series of resolutions endorsing the implementation of mandatory multilateral limits, as monitored "ex post", on each bank's net debit and credit position. Breaches of these limits as at the preliminary netting at 2.00 p.m. would be subject to sanctions. Moreover, the limit would form the basis of a liquidity-sharing and loss-sharing arrangement (called Emergency Settlement Procedure) such that the settlement of the clearing would be guaranteed by the members themselves in the event that every clearing bank would be within its debit and credit limits at 2.00 p.m. but one short bank was unable to borrow from other banks sufficient liquidity to cover its position in full.

Since September 1993, the resolutions have become binding as all the required specifications and modifications in the legal texts governing the clearing have been approved and adopted.

As a medium-term objective, the EBA has decided to study the possibility of replacing the existing net settlement system by a gross settlement system.

#### *3.4.6 Additional liquidity facilities*

In addition, certain EC central banks (Bank of England, Banque de France and Banca d'Italia) have introduced collateralised liquidity facilities to operate alongside the BIS "intermediation facility" and further strengthen the end-of-day settlement arrangements. Their aim is to facilitate the recycling of surplus funds from net credit to net debit banks by mobilising collateral held by net debit banks so that it can be used as security for overnight borrowing. The central banks involved have agreed that their facilities may be invoked before use is made of the liquidity sharing arrangement of the EBA.

## 4. SETTLEMENT OF TRANSACTIONS IN THE INTERNATIONAL SECURITIES MARKET

Euroclear and Cedel are the two major depositories and settlement organisations in the international securities market. However, both institutions also accept and settle transactions involving domestic securities. Their combined turnover in 1992 amounted to US$ 14.5 trillion, or roughly US$ 55 billion on average per business day (see also Table 5).

### 4.1 The international securities market

The international securities market consists of a number of segments which have their own characteristics. They include the international bond market for long-term debt instruments

Table 5

**Turnover in the international securities market**[1]

(in billions of US dollars)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| **Primary market** | 817 | 993 | 1,127 | 1,346 | 1,565 |
| US dollar securities | 576 | 721 | 744 | 761 | 931 |
| Straight issues[2] | 126 | 162 | 61 | 71 | 75 |
| Convertible issues | 4 | 3 | 1 | 3 | 3 |
| Floating rate notes | 20 | 12 | 25 | 9 | 32 |
| Other[3] | 426 | 544 | 656 | 676 | 821 |
| Other currencies | 241 | 272 | 383 | 585 | 634 |
| Straight issues[2] | 137 | 110 | 87 | 149 | 281 |
| Convertible issues | 6 | 4 | 2 | 2 | 3 |
| Floating rate notes | 29 | 19 | 23 | 17 | 21 |
| Other[3] | 69 | 139 | 271 | 417 | 329 |
| **Secondary market** | 3,840 | 4,091 | 5,135 | 7,487 | 12,928 |
| US dollar securities | 1,497 | 1,590 | 1,635 | 2,009 | 2,516 |
| Straight issues[2] | 810 | 914 | 886 | 1,105 | 1,479 |
| Convertible issues | 67 | 54 | 44 | 46 | 53 |
| Floating rate notes | 317 | 267 | 305 | 371 | 418 |
| Other[3] | 303 | 355 | 401 | 487 | 566 |
| Other currencies | 2,343 | 2,501 | 3,500 | 5,478 | 10,412 |
| Straight issues[2] | 936 | 819 | 1,124 | 1,910 | 9,195 |
| Convertible issues | 56 | 57 | 56 | 51 | 70 |
| Floating rate notes | 224 | 228 | 277 | 222 | 265 |
| Other[3] | 1,127 | 1,398 | 2,042 | 3,295 | 882 |
| **Total primary and secondary market** | 4,657 | 5,084 | 6,262 | 8,833 | 14,493 |
| *of which*: | | | | | |
| Cedel | 1,736 | 1,730 | 2,415 | 3,312 | 4,745 |
| US dollar securities | 575 | 573 | 831 | 1,013 | 1,269 |
| Other securities | 1,161 | 1,157 | 1,584 | 2,298 | 3,475 |
| Euroclear | 2,921 | 3,354 | 3,847 | 5,521 | 9,748 |
| US dollar securities | 1,498 | 1,738 | 1,547 | 1,757 | 2,178 |
| Other securities | 1,423 | 1,616 | 2,299 | 3,765 | 7,570 |
| **Memorandum items**: | | | | | |
| Turnover in selected domestic markets:[4] | | | | | |
| New York Stock Exchange: | | | | | |
| Equities | 1,356 | 1,543 | 1,325 | 1,520 | 1,745 |
| Federation of German Securities Exchanges: | | | | | |
| Equities | 183 | 338 | 511 | 381 | 440 |
| Bonds | 518 | 518 | 562 | 628 | 1,026 |
| Tokyo Stock Exchange: | | | | | |
| Equities | 2,234 | 2,338 | 1,288 | 823 | 477 |
| Bonds | 713 | 563 | 394 | 231 | 118 |

[1] Since May 1989 primary market turnover includes only transactions linked to the distribution of new issues whereas turnover related to grey market trading is reported under the secondary market. The data are based on individual turnover reports from Euroclear and Cedel. Transactions counted include internal deliveries by each system, deliveries received by each system from the other (Bridge deliveries) and transactions settled by each system via domestic links (both deliveries *and* receipts counted). [2] Includes Euro-bonds and other straight fixed income bands (also domestic instruments). [3] Includes transactions in short and medium-term notes. [4] Non-dollar bonds converted at year-end exchange rates.

*Sources*: ISMA, Federation Internationale des Bourses de Valeurs and national data.

(Euro-bonds and foreign bonds[13]) and the Euro-note market, where short-term paper such as commercial securities market is a multi-currency market; by far the largest proportion of the stock of international bonds is denominated in US dollars (US$ 680 billion in 1992) with other currencies trailing well behind.

Since in many countries institutional investors are prohibited from buying unlisted securities, most international bonds are listed on established stock exchanges to improve their marketability. This is done, most commonly, on the Luxembourg Stock Exchange and the London Stock Exchange. Trading, however, is normally done over-the-counter and conducted by various specialised dealer groups. One particular feature of the international securities market is that most of the securities (especially in the Euro-markets) are in bearer form and are not fully dematerialised. In principle, the transfer of ownership thus involves the transfer of the securities by physical delivery. The advantage of depositing the bearer securities in a securities account with Cedel or Euroclear is that the transfer of ownership can then take place through book entry in these security accounts. Furthermore, by simultaneously holding cash deposits with Euroclear and Cedel, users can also let the cash leg of the securities transactions be settled by these organisations. As a result Euroclear and Cedel can be defined as both securities and large-value funds transfer systems.

### 4.2 Institutional characteristics

The Euroclear system is operated by Morgan Guaranty Brussels, through a separate administrative unit called the Euroclear Operations Centre, under an operating agreement with the Euroclear Clearance System "Société Coopérative" set up under Belgian law. The "Coopérative", in turn, is controlled partly by a large number of participants in the system (11.5% of its share capital) and by the UK-based Euroclear Clearance System Public Limited Company (88.5%). The latter company, which actually owns the system, is owned by 124 banks, brokers and investment institutions. Cedel (Centrale de Livraison de Valeurs Mobilières) S.A. is a Luxembourg-based limited company (société anonyme) which provides, in return for payment, for the circulation, custody, and management of securities (and precious metals). It is currently owned by 108 shareholding financial institutions from some twenty different countries. Both institutions have customers or participants comprising major banks and securities companies (about 2,500 each) in a large number of countries.[14] Reflecting the "cooperative approach" taken by the owners of both the Euroclear and Cedel systems, no institution is entitled to hold more than a small fraction (3.25% and 5% respectively) of the shares in these companies.

Euroclear and Cedel operate as international securities depositories. They do not hold the securities in custody themselves but rely on a worldwide network of depository banks. The custody services offered by the depositories include storing the issue in the vault, administration of coupon, dividend and redemption payments, related tax services, and the exercise of warrants, conversion and other options. To limit physical movements of securities and enhance security, each individual issue is deposited and immobilised with only one depository; in the case of Euro-bonds this is normally the paying agent for the issue. Typically, the deposited securities become fully fungible, which means that the owner no longer has title to a security with a particular registration number but receives a claim on the pool of securities held by the settlement organisations; the transfer of ownership takes place by book entry in the securities accounts with Euroclear and Cedel.

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13 Foreign bonds are issued in domestic capital markets by non-resident borrowers and underwritten and sold by a syndicate composed of institutions located in the country in which the bonds are offered (which may, however, include subsidiaries of multinational financial institutions). Euro-bonds are usually issued simultaneously in several capital markets and underwritten by an international syndicate (they are almost wholly exempt from disclosure and registration requirements and from withholding taxes). However, the distinction between Euro-bonds and foreign bonds has become increasingly blurred.

14 They include a number of central banks and official international institutions.

Apart from custody and settlement services, Euroclear and Cedel offer their customers various other services, including trade matching and confirmation, cash management and financing facilities, proprietary telecommunication systems and securities lending and borrowing programmes. Regarding funds transfer facilities, participants pay and receive funds in the different currencies accepted by the systems through each system's cash correspondent in the respective country of issue.

### 4.3 Settlement procedures

The settlement procedures followed by Euroclear and Cedel are similar and can be summarised in four points. Firstly, both institutions operate a gross securities and cash settlement system: each instruction is carried out individually with the crediting/debiting of securities accounts taking place simultaneously with the corresponding debiting/crediting of the cash accounts. However, the instructions are not carried out on a continuous basis but are stored by the computer up to a certain cut-off time, after which they enter an automated batch settlement programme. All validated and matched settlement instructions enter the settlement process, which is carried out during the night prior to the settlement date.[15]

Secondly, securities transfers and the related payments are executed on a delivery against payment principle. This means that the settlement of individual transactions is successfully completed only if the selling participant has sufficient securities in his securities account or has access to securities borrowing facilities to permit delivery and if the buyer has a sufficient cash or cash credit position available for payment. Once the settlement programme is terminated settlement is final and participants are notified of their securities and cash positions. The strict application of the principle means that a number of instructions entering the automated settlement process are not executed. They normally re-enter the settlement process on the following business day.

Thirdly, delivery instructions are not processed in the chronological order in which they are transmitted by the participants but according to a certain rank for each individual issue. The ranking criteria differ between Euroclear and Cedel but include the priority codes given by the participants themselves, the settlement date (normally old instructions before more recent ones) and the nominal amount of the transaction. The automated settlement process groups all trades related to the same issue and subsequently attempts to settle as many trades as possible for each issue using a so-called "chaining" procedure. Very often settlement instructions reflect the fact that the same security has been bought and sold through one or more intermediaries (brokers) a number of times during the trading day. The computer program will, for instance, try to recognise so-called back-to-back transactions involving the purchase and sale by two participants of the same security through a broker and treat such transactions as a group for settlement purposes. The chaining program also tries to settle as many transactions as possible related to the same security in light of the cash and security positions available in the participants' accounts and by taking account of the expected movements in the accounts during the settlement processing cycle. These patterns of settlement are optimised by recourse to recursive simulations.

Fourthly, since many trades in the international securities market will be conducted by counterparties belonging to the other settlement system, Euroclear and Cedel have automated the linkage between their securities settlement systems by installing an electronic "Bridge". Cross-system settlement is thus also handled by book-entry transfers between the two systems. For this, each system maintains a securities and a cash account with the other. When one of the two organisations finds itself with a substantial custody holding for the other, the two systems transfer securities from one system's depository to the other system's depository. In contrast, cash settlements between the two systems take place on a net basis for each individual currency each day. Given that the volume of

15 Until September 1993 Cedel processed validated and matched instructions in the afternoon on the settlement day. It continues to run a daytime settlement process. Euroclear has announced that it will also introduce a daytime settlement process.

securities movements between the two systems results in substantial cash movements as well, each system has arranged a special credit line for the other to cover the inter-system credit exposures.

In order to enable participants to settle transactions in domestic markets through the international settlement systems, Euroclear and Cedel provide two types of linkages to domestic clearing systems. In the case of direct links, Euroclear and Cedel themselves hold an account with a local clearing system and cross-border transactions can be settled without the intervention of the local depository. Where there is no direct link, a local Euroclear/Cedel depository holds an account with its domestic clearing system and trades between Euroclear and Cedel participants and their counterparties in the domestic market are settled through the intermediary of this depository.

### 4.4 Other features (liquidity facilities, risk management)

With respect to risk management in both the Euroclear and the Cedel systems, principal risk is limited by the delivery against payment principle used by both organisations, while liquidity risk is reduced by various cash credit facilities and securities lending programmes. Moreover, the combined exposure for each participant under both these lending schemes must normally be collateralised by holdings of securities (expressed in US dollars). For this, the value of the securities eligible as collateral is marked to market each day and adjustments are made taking into account the type of instrument and the exchange rate of the respective currency of issue vis-à-vis the dollar (haircuts). With respect to the credit line which Euroclear and Cedel have opened for one another to cover the execution of "Bridge" settlements, this facility is covered by a letter of credit which each system obtains from a separate syndicate of banks.

Central banks are not directly involved in providing payment services for the settlement of international securities transactions. The link with the respective domestic payment systems is through the participation of Euroclear's/Cedel's cash correspondents in the respective local interbank funds transfer systems. Various central banks have a relationship with one or both of the international clearing organisations, however, through the direct or indirect linkage which these systems have with a number of domestic securities settlement systems. For example, Euroclear and Cedel have links with the Banque de France for the settlement of transactions in various domestic government securities, with the Bank of England (for ECU Treasury bills), the Nederlandsche Bank (for Euro-commercial paper) and with the National Bank of Belgium (for certain government bonds and Treasury bills).

## Annex 1

# COMPARATIVE TABLES

Table 1

**Notes and coin in circulation**[1]

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| | **USD per inhabitant**[2] | | | | |
| Belgium | 1,121 | 1,185 | 1,335 | 1,331 | 1,239 |
| Canada | 579 | 625 | 636 | 670 | 652 |
| France | 694 | 756 | 880 | 863 | 828 |
| Germany | 1,298 | 1,380 | 1,330 | 1,411 | 1,534 |
| Italy | 761 | 924 | 1,065 | 1,168 | 1,023 |
| Japan | 2,276 | 2,288 | 2,570 | 2,789 | 2,739 |
| Netherlands | 1,189 | 1,267 | 1,436 | 1,433 | 1,354 |
| Sweden | 1,189 | 1,248 | 1,421 | 1,457 | 1,467 |
| Switzerland | 2,693 | 2,491 | 3,053 | 2,802 | 2,748 |
| United Kingdom | 457 | 434 | 511 | 509 | 446 |
| United States | 887 | 922 | 998 | 1,070 | 1,167 |
| | **As percentage of GDP** | | | | |
| Belgium | 7.5 | 7.0 | 6.4 | 6.2 | 5.9 |
| Canada | 3.0 | 2.9 | 3.0 | 3.1 | 3.3 |
| France | 4.1 | 4.0 | 3.9 | 3.4 | 3.7 |
| Germany[3] | 6.8 | 6.6 | 6.5 | 6.5 | 7.2 |
| Italy | 5.2 | 5.7 | 5.3 | 5.4 | 5.7 |
| Japan | 9.5 | 10.2 | 10.1 | 9.6 | 9.1 |
| Netherlands | 7.7 | 7.6 | 7.2 | 6.9 | 6.6 |
| Sweden | 5.5 | 5.6 | 5.4 | 5.3 | 5.1 |
| Switzerland | 9.8 | 9.0 | 8.4 | 8.0 | 8.0 |
| United Kingdom | 3.1 | 3.0 | 2.8 | 2.7 | 2.9 |
| United States | 4.4 | 4.3 | 4.5 | 4.7 | 4.9 |
| | **As percentage of narrow money**[4] | | | | |
| Belgium | 34.8 | 32.5 | 31.3 | 31.2 | 31.5 |
| Canada | 44.6 | 46.4 | 48.9 | 49.9 | 50.2 |
| France | 15.6 | 15.2 | 15.1 | 15.8 | 15.9 |
| Germany | 33.4 | 32.6 | 27.1 | 28.4 | 29.9 |
| Italy | 14.3 | 15.0 | 14.4 | 14.2 | 15.7 |
| Japan | 31.5 | 35.3 | 36.0 | 33.1 | 31.2 |
| Netherlands | 31.3 | 30.3 | 29.0 | 28.5 | 27.4 |
| Sweden | 13.9 | 13.4 | 12.5 | 12.8 | 11.9 |
| Switzerland | 32.1 | 33.0 | 32.7 | 33.6 | 33.0 |
| United Kingdom | 6.7 | 6.5 | 6.0 | 5.6 | 4.8 |
| United States | 27.2 | 28.2 | 29.2 | 29.4 | 28.4 |

[1] For explanation of figures see relevant country tables. [2] Year-end figures converted at end-of-year exchange rates. [3] GDP for old Länder only. [4] Narrow money: $M_1$; except for Sweden ($M_3$) and the United Kingdom ($M_2$).

Table 2

**Transferable deposits held by non-banks[1]**

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| | **USD per inhabitant[2]** | | | | |
| Belgium | 2,103 | 2,465 | 2,925 | 2,929 | 2,700 |
| Canada | 3,564 | 3,841 | 3,752 | 3,866 | 3,644 |
| France | 3,751 | 4,231 | 4,936 | 4,596 | 4,382 |
| Germany | 2,621 | 2,918 | 3,732 | 3,655 | 3,591 |
| Italy | 4,409 | 4,994 | 6,070 | 6,756 | 5,286 |
| Japan | 6,043 | 6,165 | 6,058 | 7,001 | 7,141 |
| Netherlands | 2,608 | 2,921 | 3,519 | 3,590 | 3,589 |
| Sweden | 8,530 | 9,336 | 11,337 | 11,431 | 12,274 |
| Switzerland | 5,700 | 5,063 | 6,283 | 5,565 | 5,601 |
| United Kingdom | 6,363 | 6,227 | 8,067 | 8,515 | 8,917 |
| United States | 2,334 | 2,328 | 2,387 | 2,540 | 2,907 |
| | **As percentage of GDP** | | | | |
| Belgium | 14.0 | 14.5 | 14.1 | 13.6 | 12.8 |
| Canada | 18.2 | 18.0 | 17.4 | 18.0 | 18.5 |
| France | 22.2 | 22.4 | 22.0 | 20.9 | 19.3 |
| Germany[3] | 13.7 | 14.0 | 18.3 | 16.9 | 16.8 |
| Italy | 30.3 | 30.6 | 30.2 | 31.0 | 29.4 |
| Japan | 24.9 | 25.4 | 27.8 | 27.1 | 25.4 |
| Netherlands | 16.9 | 17.5 | 17.6 | 17.3 | 17.4 |
| Sweden | 39.7 | 41.9 | 42.9 | 41.8 | 43.1 |
| Switzerland | 20.8 | 18.4 | 17.3 | 15.9 | 16.3 |
| United Kingdom | 42.6 | 42.9 | 43.6 | 45.8 | 57.2 |
| United States | 11.7 | 11.0 | 10.8 | 11.2 | 12.3 |
| | **As percentage of narrow money[4]** | | | | |
| Belgium | 65.2 | 67.5 | 68.7 | 68.8 | 68.5 |
| Canada | 275.0 | 285.0 | 288.5 | 288.0 | 280.7 |
| France | 84.4 | 84.8 | 84.9 | 84.2 | 84.1 |
| Germany | 67.4 | 68.9 | 76.1 | 73.7 | 70.1 |
| Italy | 82.7 | 80.9 | 82.1 | 82.2 | 81.3 |
| Japan | 86.8 | 87.4 | 96.7 | 97.9 | 91.5 |
| Netherlands | 68.7 | 69.7 | 71.0 | 71.5 | 72.6 |
| Sweden | 94.7 | 94.4 | 93.6 | 94.3 | 95.3 |
| Switzerland | 67.9 | 67.0 | 67.3 | 66.4 | 67.0 |
| United Kingdom | 93.3 | 93.5 | 94.0 | 94.4 | 95.2 |
| United States | 71.9 | 71.0 | 69.9 | 69.8 | 70.8 |

[1] For explanation of figures and definition of transferable deposits, see relevant country tables. [2] Year-end figures converted at end-of-year exchange rates. [3] GDP for old Länder only. [4] Narrow money: $M_1$; except for Sweden ($M_3$) and the United Kingdom ($M_2$).

Table 3

**Settlement media used by banks**[1]

(1992)

| | **Banks' reserves at central bank (USD billion)**[2] | **Banks' reserves at central bank in percentage of narrow money**[3] | **Transferable deposits at other banks (USD billion)**[2] | **Transferable deposits at other banks in percentage of narrow money**[2] |
|---|---|---|---|---|
| Belgium ..... | 0.063 | 0.16 | 15.7 | 37.2 |
| Canada ..... | 0.9 | 2.6 | 0.1 | 0.2 |
| France ..... | 3.5 | 1.2 | 465.3 | 156.2 |
| Germany ..... | 53.5 | 12.9 | 186.6 | 45.0 |
| Italy ..... | 88.4 | 23.9 | 31.6 | 8.5 |
| Japan ..... | 23.2 | 2.1 | 73.3 | 7.5 |
| Netherlands ..... | 0.018 | 0.02 | 0.002 | 0.001 |
| Sweden ..... | 0.7 | 0.6 | 5.0 | 5.5 |
| Switzerland ..... | 3.2 | 5.5 | 12.9 | 22.3 |
| United Kingdom ..... | 2.1 | 0.4 | 318.6 | 58.9 |
| United States ..... | 32.1 | 3.1 | 33.0 | 3.2 |

[1] For explanation of figures see relevant country tables. [2] Year-end figures converted at end-of-year exchange rates. [3] Narrow money: $M_1$; except for Sweden ($M_3$) and the United Kingdom ($M_2$).

Table 4

**Institutional framework**[1]

(1992)

| | Number of institutions | Number of inhabitants per institution | Number of branches | Number of inhabitants per branch | Number of accounts per inhabitant |
|---|---|---|---|---|---|
| Belgium ..... | 130 | 77,462 | 12,525 | 804 | 1.0 |
| Canada[2] ..... | 2,783 | 9,900 | 13,879 | 1,985 | . |
| France ..... | 635 | 90,221 | 47,136 | 1,214 | 1.1 |
| Germany ..... | 4,066 | 19,921 | 71,876 | 1,127 | 1.0 |
| Italy ..... | 1,026 | 55,458 | 35,299 | 1,612 | 0.4 |
| Japan ..... | 6,253 | 19,910 | 71,238 | 1,748 | . |
| Netherlands ..... | 133 | 113,534 | 7,478 | 2,019 | 1.0 |
| Sweden ..... | 110 | 78,818 | 4,704 | 1,843 | 3.3 |
| Switzerland ..... | 437 | 15,800 | 7,922 | 872 | . |
| United Kingdom ..... | 602 | 96,013 | 39,189 | 1,475 | 2.4 |
| United States ..... | 27,028 | 9,453 | 71,891 | 3,554 | . |

[1] For explanation of figures see relevant country tables. [2] Deposit-taking institutions only.

Table 5

**Cash dispensers and ATMs**[1]

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| | **Number of machines per 1,000,000 inhabitants** | | | | |
| Belgium | 85 | 92 | 94 | 105 | 109 |
| Canada | 242 | 346 | 438 | 484 | 531 |
| France | 206 | 231 | 255 | 284 | 305 |
| Germany | 122 | 148 | 141 | 171 | 235 |
| Italy | 99 | 135 | 169 | 204 | 245 |
| Japan | 556 | 627 | 711 | 795 | 870 |
| Netherlands | 69 | 124 | 180 | 222 | 263 |
| Sweden | 206 | 227 | 245 | 258 | 254 |
| Switzerland | 262 | 292 | 335 | 347 | 387 |
| United Kingdom | 245 | 275 | 296 | 309 | 316 |
| United States | 296 | 306 | 321 | 331 | 342 |
| | **Number of transactions per inhabitant** | | | | |
| Belgium | 5.7 | 6.8 | 7.1 | 8.1 | 8.8 |
| Canada | 25.4 | 28.8 | 29.6 | 34.9 | 37.4 |
| France | 8.0 | 9.0 | 10.0 | 11.0 | 11.0 |
| Germany | . | . | . | . | . |
| Italy[2] | 1.4 | 1.7 | 2.2 | 2.9 | 3.6 |
| Japan | . | . | 1.7 | 2.4 | 3.0 |
| Netherlands | . | . | 11.0 | 24.0 | 32.0 |
| Sweden | 18.0 | 20.5 | 19.9 | 24.1 | 25.1 |
| Switzerland | 4.0 | 5.0 | 5.8 | 6.6 | 7.4 |
| United Kingdom | 13 2 | 15.4 | 17.3 | 18.5 | 19.8 |
| United States | 18.4 | 20.6 | 23.2 | 25.3 | 28.2 |
| | **Average value of transactions (USD)**[3] | | | | |
| Belgium | 94.4 | 94.2 | 113.2 | 117.4 | 113.2 |
| Canada[4] | 47.9 | 52.4 | 54.8 | 56.7 | 55.6 |
| France | 75.3 | 72.3 | 81.4 | 83.4 | 95.5 |
| Germany | . | . | . | . | . |
| Italy | 199.0 | 195.6 | 238.5 | 239.2 | 245.4 |
| Japan | . | . | 354.2 | 356.5 | 355.4 |
| Netherlands | . | . | 85.0 | 90.4 | 95.6 |
| Sweden | 94.4 | 91.8 | 106.3 | 120.6 | 128.6 |
| Switzerland | 223.4 | 197.9 | 231.9 | 224.6 | 225.1 |
| United Kingdom | 68.0 | 65.0 | 77.0 | 81.0 | 83.0 |
| United States | 66.0 | 64.7 | 66.0 | 67.0 | 66.9 |

[1] For explanation of figures see relevant country tables. [2] Estimated figures referring to the whole system; they differ from those provided in the statistical annex of the Italian chapter. [3] Converted at yearly average exchange rates. [4] Average value of a cash withdrawal only.

Table 6

**EFTPOS terminals**[1]

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| | **Number of terminals per 1,000,000 inhabitants** | | | | |
| Belgium | 1,925 | 2,477 | 2,828 | 3,213 | 4,034 |
| Canada | 34 | 162 | 345 | 489 | 1,076 |
| France | 2,154 | 2,842 | 3,180 | 3,568 | 5,594 |
| Germany | 141 | 174 | 290 | 432 | 640 |
| Italy | 76 | 178 | 385 | 805 | 1,094 |
| Japan | 6 | 14 | 82 | 213 | 264 |
| Netherlands | 102 | 138 | 148 | 267 | 758 |
| Sweden | 83 | 403 | 711 | 1,034 | 1,647 |
| Switzerland | 211 | 322 | 384 | 758 | 1,640 |
| United Kingdom | 426 | 1,311 | 1,916 | 3,299 | 3,806 |
| United States | 183 | 200 | 240 | 348 | 450 |
| | **Number of transactions per inhabitant** | | | | |
| Belgium | 5.3 | 6.7 | 7.9 | 9.9 | 12.0 |
| Canada | < 0.1 | 0.1 | 0.1 | 0.4 | 1.1 |
| France | 7.5 | 11.0 | 16.5 | 18.5 | 22.7 |
| Germany | 0.01 | 0.01 | 0.04 | 0.25 | 0.35 |
| Italy[2] | 0.02 | 0.05 | 0.12 | 0.19 | 0.28 |
| Japan | 0.001 | 0.002 | 0.004 | 0.006 | 0.006 |
| Netherlands | . | 1.1 | 1.8 | 2.1 | 3.1 |
| Sweden | 0.2 | 0.6 | 1.6 | 3.5 | 4.7 |
| Switzerland | 0.4 | 0.9 | 1.4 | 2.0 | 2.8 |
| United Kingdom | . | . | . | . | . |
| United States | 0.4 | 0.5 | 0.7 | 1.0 | 1.3 |
| | **Average value of transactions (USD)**[3] | | | | |
| Belgium | 34.8 | 42.2 | 55.4 | 57.9 | 57.7 |
| Canada | 42.6 | 43.1 | 42.8 | 44.3 | 43.8 |
| France | 81.6 | 65.8 | 59.7 | 58.5 | 62.5 |
| Germany | 94.8 | 66.4 | 35.4 | 53.6 | 43.5 |
| Italy | 102.1 | 101.6 | 138.8 | 163.6 | 161.6 |
| Japan | . | . | . | 103.9 | 97.7 |
| Netherlands | . | 19.4 | 26.5 | 30.1 | 45.9 |
| Sweden | 163.1 | 124.1 | 96.5 | 93.5 | 100.7 |
| Switzerland | 25.3 | 25.6 | 35.3 | 41.0 | 51.8 |
| United Kingdom | . | . | . | . | . |
| United States | 10.0 | 30.9 | 33.3 | 26.1 | 24.0 |

[1] For explanation of figures see relevant country tables. [2] Estimated figures referring to the whole system; they differ from those provided in the statistical annex of the Italian chapter. [3] Converted at yearly average exchange rates.

Table 7

**Number of cards**[1]

(1992, per 1,000 inhabitants)

| | Cards with a cash function | Cards with a debit/credit function | Cards with cheque guarantee function | Retailers cards |
|---|---|---|---|---|
| Belgium | 774 | 785 | 457 | 91 |
| Canada | 1,158 | 486 | . | 4,537 |
| France | 368 | 365 | 3 | 350 |
| Germany | . | 484 | 393 | 37 |
| Italy | 240 | 235 | 38 | . |
| Japan | 2,018 | 1,681 | . | 398 |
| Netherlands | 830 | 99 | 117 | . |
| Sweden | 227 | 446 | . | 681 |
| Switzerland | 548 | 659 | 411 | . |
| United Kingdom | 1,175 | 874 | 768 | 190 |
| United States | 704 | 1,809 | . | 1,811 |

[1] For explanation of figures see relevant country tables.

Table 8

**Relative importance of cashless payment instruments**[1]

(percentage of total volume of cashless transactions)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| | **Cheques** | | | | |
| Belgium | 31.1 | 27.7 | 23.8 | 21.5 | 18.8 |
| Canada | 70.9 | 68.7 | 66.8 | 64.8 | 62.4 |
| France | 57.3 | 55.2 | 54.5 | 52.4 | 50.8 |
| Germany | 9.8 | 9.6 | 9.9 | 9.6 | 8.8 |
| Italy[2] | 45.8 | 45.0 | 44.2 | 41.6 | 40.0 |
| Japan | . | . | . | . | . |
| Netherlands | 17.7 | 15.9 | 15.2 | 14.3 | 12.3 |
| Sweden | 19.5 | 20.5 | 14.9 | 9.9 | 8.9 |
| Switzerland[3] | 8.1 | 7.6 | 6.4 | 5.4 | 4.4 |
| United Kingdom[4] | 56.0 | 54.0 | 51.0 | 49.0 | 45.0 |
| United States | 83.5 | 83.6 | 81.5 | 81.2 | 80.5 |
| | **Payment by cards** | | | | |
| Belgium | 7.9 | 9.1 | 11.0 | 13.3 | 15.6 |
| Canada | 24.2 | 25.9 | 26.8 | 27.8 | 28.9 |
| France | 10.5 | 12.3 | 13.1 | 14.4 | 15.0 |
| Germany | 0.7 | 1.2 | 1.5 | 1.8 | 2.1 |
| Italy[2] | 1.0 | 1.6 | 2.4 | 3.1 | 3.7 |
| Japan | . | . | . | . | . |
| Netherlands | 0.3 | 1.0 | 1.6 | 1.8 | 2.6 |
| Sweden | 5.7 | 6.0 | 6.8 | 8.7 | 8.8 |
| Switzerland | 4.9 | 5.7 | 7.0 | 9.7 | 11.8 |
| United Kingdom | 11.0[5] | 12.0 | 14.0 | 16.0 | 19.0 |
| United States | 14.7 | 14.4 | 16.2 | 16.3 | 16.8 |

[1] For explanation of figures see relevant country tables. In some cases the total may not sum to 100% because of other items. [2] Estimated figures referring to the whole system; they differ from those provided in the statistical annex of the Italian chapter. [3] Postal cheques are not included because detailed figures were no longer published by the PTT after 1992. In 1991 its share was approximately 4%. [4] Includes Town cheques. [5] Credit cards only.

Table 8

**Relative importance of cashless payment instruments**[1] (contd.)

(percentage of total volume of cashless transactions)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| | **Credit transfers** | | | | |
| Belgium | 54.0 | 56.0 | 57.6 | 57.0 | 56.8 |
| Canada | 3.0 | 3.2 | 3.6 | 3.9 | 4.4 |
| France | 15.3 | 15.2 | 15.0 | 15.3 | 15.4 |
| Germany | 52.9 | 51.6 | 51.6 | 51.3 | 49.8 |
| Italy[2] | 39.8 | 39.8 | 40.0 | 40.9 | 42.1 |
| Japan | . | . | . | . | . |
| Netherlands | 65.1 | 63.5 | 62.1 | 61.3 | 61.3 |
| Sweden | 71.9 | 70.2 | 74.6 | 77.0 | 77.7 |
| Switzerland | 85.2 | 84.7 | 84.4 | 82.7 | 81.3 |
| United Kingdom[3] | 22.0 | 22.0 | 21.0 | 21.0 | 21.0 |
| United States | 1.2 | 1.3 | 1.5 | 1.6 | 1.8 |
| | **Direct debits** | | | | |
| Belgium | 7.0 | 6.9 | 7.6 | 8.2 | 8.8 |
| Canada | 1.9 | 2.2 | 2.8 | 3.5 | 4.3 |
| France | 8.8 | 9.1 | 9.4 | 9.4 | 10.2 |
| Germany | 36.6 | 37.6 | 37.0 | 37.3 | 39.3 |
| Italy[2] | 2.1 | 2.6 | 3.1 | 3.8 | 4.1 |
| Japan | . | . | . | . | . |
| Netherlands | 16.8 | 19.6 | 21.1 | 22.6 | 23.8 |
| Sweden | 2.9 | 3.3 | 3.7 | 4.4 | 4.6 |
| Switzerland | 1.7 | 2.0 | 2.2 | 2.3 | 2.5 |
| United Kingdom | 11.0 | 12.0 | 13.0 | 14.0 | 15.0 |
| United States | 0.6 | 0.7 | 0.7 | 0.8 | 0.9 |

[1] For explanation of figures see relevant country tables. In some cases the total may not sum to 100% because of other items. [2] Estimated figures referring to the whole system; they differ from those provided in the statistical annex of the Italian chapter. [3] Paper-based and paperless (includes large value: CHAPS).

Table 9

**Relative importance of cashless payment instruments**[1]

(percentage of total value of cashless transactions)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| | **Cheques** | | | | |
| Belgium | 10.4 | 9.3 | 7.5 | 5.4 | 6.2 |
| Canada | 99.3 | 99.2 | 99.1 | 99.0 | 98.8 |
| France | 9.4 | 9.2 | 8.6 | 7.3 | 6.4 |
| Germany | 3.7 | 3.4 | 2.7 | 2.8 | 2.4 |
| Italy[2] | 19.9 | 15.3 | 10.5 | 9.1 | 7.1 |
| Japan | . | . | . | . | . |
| Netherlands | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| Sweden | 13.0 | 13.0 | 11.0 | 11.0 | 10.0 |
| Switzerland[3] | 0.2 | 0.2 | 0.2 | 0.2 | 0.1 |
| United Kingdom[4] | 48.0 | 41.0 | 25.0 | 16.0 | 12.0 |
| United States | 15.0 | 15.5 | 14.1 | 13.7 | 13.0 |
| | **Payment by cards** | | | | |
| Belgium | 0.09 | 0.10 | 0.13 | 0.14 | 0.16 |
| Canada | 0.2 | 0.3 | 0.3 | 0.3 | 0.3 |
| France | 0.1 | 0.2 | 0.2 | 0.2 | 0.2 |
| Germany | 0.01 | 0.01 | 0.02 | 0.02 | 0.02 |
| Italy[2] | 0.03 | 0.04 | 0.04 | 0.04 | 0.04 |
| Japan | . | . | . | . | . |
| Netherlands | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Sweden | 0.5 | 0.5 | 0.5 | 0.5 | 1.0 |
| Switzerland[5] | . | . | . | . | . |
| United Kingdom | < 0.1[6] | 0.1 | 0.1 | 0.2 | 0.2 |
| United States | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |

[1] For explanation of figures see relevant country tables. In some cases the total may not sum to 100% because of other items. [2] Estimated figures referring to the whole system; they differ from those provided in the statistical annex of the Italian chapter. [3] Postal cheques are not included because detailed figures were no longer published by the PTT after 1992. In 1991 its share was below 0.1%. [4] Includes Town cheques. [5] Below 0.1%. [6] Credit cards only.

Table 9 (contd.)

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| | **Credit transfers** | | | | |
| Belgium | 89.3 | 90.4 | 92.2 | 94.3 | 93.4 |
| Canada | 0.4 | 0.4 | 0.5 | 0.6 | 0.7 |
| France | 87.6 | 87.7 | 88.8 | 90.0 | 91.2 |
| Germany | 94.7 | 95.1 | 95.5 | 95.4 | 95.5 |
| Italy[2] | 76.1 | 81.2 | 87.0 | 88.6 | 91.1 |
| Japan | . | . | . | . | . |
| Netherlands | 98.7 | 98.5 | 98.6 | 98.4 | 98.6 |
| Sweden | 83.0 | 83.0 | 85.0 | 85.0 | 86.0 |
| Switzerland[7] | 99.8 | 99.8 | 99.8 | 99.8 | 99.9 |
| United Kingdom[8] | 52.0 | 59.0 | 74.0 | 83.0 | 87.0 |
| United States | 84.2 | 83.7 | 85.1 | 85.2 | 85.7 |
| | **Direct debits** | | | | |
| Belgium | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| Canada | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 |
| France | 0.8 | 0.8 | 0.6 | 0.7 | 0.6 |
| Germany | 1.6 | 1.5 | 1.8 | 1.8 | 2.1 |
| Italy[2] | 0.3 | 0.3 | 0.2 | 0.3 | 0.2 |
| Japan | . | . | . | . | . |
| Netherlands | 1.1 | 1.2 | 1.2 | 1.4 | 1.2 |
| Sweden | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Switzerland | . | . | . | . | . |
| United Kingdom | 0.7 | 0.7 | 0.9 | 1.2 | 1.1 |
| United States | 0.7 | 0.7 | 0.7 | 1.0 | 1.1 |

[7] Only SIC and credit transfer through PTT. [8] Paper-based and paperless (includes large-value: CHAPS).

Table 10a

**Features of selected interbank funds transfer systems**[1]

(figures relate to 1992)

| | Type[2] | Owner/ Manager[3] | No. of participants | *of which direct* | Processing[4] | Settlement[5] | Membership[6] |
|---|---|---|---|---|---|---|---|
| **Belgium** | | | | | | | |
| CH | L + R | B + CB | 147 | 71 | M | N | O |
| CEC | R | B + CB | 129 | . | ACH | N | O |
| **Canada** | | | | | | | |
| IIPS | L | B + AS | 67 | 23 | . | .[7] | RM |
| **France** | | | | | | | |
| SAGITTAIRE | L | CB | 62 | 62 | RTT | N | RM |
| CH Paris[8] | L + R | B | 421 | 40 | M | N | RM |
| CH Provinces[9] | R | CB | .[10] | .[10] | M | N | O |
| SIT | R | B | 204 | 25 | RTT | BN | R |
| Clearing Computer | R | CB | 597 | 18 | ACH | N | RM |
| CREIC | R | CB | 16 | 16 | ACH | N | O |
| Card payments | R | B | 207 | 11 | ACH | N | RM |
| TBF | L | CB | . | . | RTT | RTGS | O |
| **Germany** | | | | | | | |
| MAOBE | R | CB | 5,703 | . | ACH[11] | GS | O |
| DTA | R | CB | 5,703 | . | ACH | GS | O |
| EIL-ZV | L | CB | 5,703 | . | RTT | RTGS | O |
| Platz.[12] | L + R | CB | 5,703 | . | M | GS | O |
| Konv. Abrechnung[13] | L + R | CB | 1,783 | . | M | N | O |
| EAF | L | CB | 39 | . | RTT | N | RM |
| **Italy** | | | | | | | |
| Local clearing | L + R | CB | 574 | 274 | M | N | O |
| Retail | R | CB[14] | 948 | 148 | ACH | N | O |
| ME[15] | L | CB | 106 | 106 | RTT | N | O |
| SIPS | L | CB[14] | 292 | 292 | RTT | N | O |
| BISS | L | CB | 379 | 379 | RTT | RTGS | O |

[1] For additional information see relevant country chapters. [2] L = Large-value system, R = Retail system. [3] Owner/Manager: B = Banks, CB = Central Banks, AS Payment Association. [4] Processing method: M = Manual, ACH = Automated Clearing House (off-line), RTT = Real-Time Transmission. [5] N = Multilateral Netting, BN = Bilateral Netting, RTGS = Real-Time Gross Settlement, GS = other Gross Settlement. [6] O = Open Membership (any bank can apply) or RM = Restricted Membership (subject to criteria). [7] Other (see Table 11, Footnote 7). [8] Clearing House in Paris. [9] Clearing Houses in the provinces. [10] All institutions on which cheques are drawn or at which bills of exchange are payable, are bound by regulations to participate in the local clearing houses, through an agent in certain cases. [11] ACH for paper-based instruments. [12] Platzüberweisungsverkehr. [13] Konventionelle Abrechnung. [14] System managed by the Interbank Society for Automation in the name and on behalf of the Banca d'Italia. [15] Electronic memoranda.

Table 10a (contd.)

| | Degree of centralisation[16] | Pricing[17] | Closing time for same-day transactions[18] | Number of transactions (thousands) | Value of transactions (USD billions)[19] | Ratio of transactions value to GDP (at annual rate) |
|---|---|---|---|---|---|---|
| **Belgium** | | | | | | |
| CH | D | V | 16.30 | 24,666 | 6,322.13 | 28.9 |
| CEC | C | F | 13.45 | 695,200 | 496 | 2.7 |
| **Canada** | | | | | | |
| IIPS | D | N | 16.00 | 1,560 | 8,359 | 14.7 |
| **France** | | | | | | |
| SAGITTAIRE | C | F | 13.00 | 3,300 | 10,981 | 8.5 |
| CH Paris[8] | C | F | 15.00 | 761,969 | 22,294 | 17.2 |
| CH Provinces[9] | D | N | 11.00 | 3,121,268 | 1,537 | 1.2 |
| SIT | D | F | 13.30 | 301,800 | 44 | 0.03 |
| Clearing Computer | D | F | 11.00 | 1,811,000 | 1,421 | 1.1 |
| CREIC | D | V | NO | 231,000 | 24 | 0.02 |
| Card payments | D | F | 10.30 | 1,609,000 | 106 | 0.08 |
| TBF | N | F | 17.00 | 11,000 | 40,423 | 31.2 |
| **Germany**[20] | | | | | | |
| MAOBE | D | V | NO | 588,472 | 2,019 | 1.13 |
| DTA | D | V | NO | 2,061,044 | 1,089 | 0.61 |
| EIL-ZV | D | F | 14.30 | 2,649 | 8,728 | 4.87 |
| Platz.[12] | D | N | 12.00 | 71,865 | 5,406 | 3.02 |
| Konv. Abrechnung[13] | D | N | 12.00 | 381,159 | 35,510 | 19.82 |
| EAF | C | V | 12.30 | 7,774 | 53,237 | 29.71 |
| **Italy** | | | | | | |
| Local clearing | D | V | 9.30 | 292,129 | 5,157 | 4.2 |
| Retail | C | F | NO | 361,783 | 213 | 0.2 |
| ME[15] | C | V | 16.00 | 1,804 | 8,480 | 6.9 |
| SIPS | C | F | 14.00 | 2,780 | 9,733 | 8.0 |
| BISS | C | V | 17.00 | 20 | 80 | 0.1 |

[16] Geographical access to the system: C = Centralised (one processing centre only) or D = Decentralised. [17] Prices charged to participants: F = Full costs (including investments), V = Variable costs, S = Symbolic costs (below variable costs), N = No costs. [18] Closing time for same day transactions (NO = no same day transactions). [19] Converted at yearly average exchange rates. [20] GDP for old Länder only.

Table 10b

**Features of selected interbank funds transfer systems**[1]

(figures relate to 1992)

| | Type[2] | Owner/ Manager[3] | No. of participants | *of which direct* | Processing[4] | Settlement[5] | Membership[6] |
|---|---|---|---|---|---|---|---|
| **Japan** | | | | | | | |
| FEYCS | L | B | 371[7] | 371[7] | RTT | N | RM |
| BOJ-NET | L | CB | 175[7] | 175[7] | RTT | RTGS[8] | RM |
| **Netherlands** | | | | | | | |
| BGC-CH | R | B | 67 | 67 | ACH | N | O |
| 8007-S.W.I.F.T. | L | B | 58 | 58 | ACH + RTT | N | O |
| FA | L | CB | 132 | 132 | M + RTT | N + RTGS | O |
| **Sweden** | | | | | | | |
| RIX | L + R | CB | 111 | 20 | RTT | RTGS + GS | RM |
| Data-Clearing | R | B | 109 | 19 | ACH | - | O |
| **Switzerland** | | | | | | | |
| SIC | L + R | CB + B | 162 | 162 | RTT | RTGS | RM |
| DTA/LSV | R | B | 162 | 162 | ACH | N | RM |
| **United Kingdom** | | | | | | | |
| CHAPS | L | B | 434 | 14 | RTT | N | RM |
| TOWN | L | B | 12 | 12 | M | N | RM |
| BACS | R | B | 35,000 | 19 | ACH | N | RM |
| Cheque/credit | R | B | 625 | 12 | M | N | RM |
| **United States** | | | | | | | |
| Fedwire | L | CB | 11,200 | 11,200 | RTT | RTGS | O |
| CHIPS | L | B | 122 | 122 | RTT | N | RM |

[1] For additional information see relevant country chapters. [2] L = Large-value system; R = Retail system. [3] Owner/Manager: B = Banks, CB = Central banks. [4] Processing Method: M = Manual, ACH = Automated Clearing House (off-line), RTT = Real Time Transmission. [5] N = Multilateral netting, BN = Bilateral netting, RTGS = Real-time gross settlement, GS = Other gross settlement. [6] O = Open Membership (any bank can apply) or RM = Restricted Membership (subject to criteria). [7] End-June 1993. [8] The system has been designed to allow participants to enter funds transfer instructions continuously, in which case settlement takes place on the central bank's books immediately. It is, however, also used to settle on a net basis.

Table 10b (contd.)

| | Degree of centralisation[9] | Pricing[10] | Closing time for same-day transactions[11] | Number of transactions (thousands) | Value of transactions (USD billions) | Ratio of transactions value to GDP (at annual rate) |
|---|---|---|---|---|---|---|
| **Japan** | | | | | | |
| FEYCS | D | V[12] | 13.45 | 6,119 | 49,029 | 13.4 |
| BOJ-NET | D | V[12] | 17.00 | 3,710 | 283,462 | 77.2 |
| **Netherlands** | | | | | | |
| BGC-CH | D | F | 12.45 | 1,043.7 | 1,942 | 3.4 |
| 8007-S.W.I.F.T. | C | F | 12.45 | 1.8 | 8,055 | 14.3 |
| FA | C | V | 15.30 | 0.6 | 7,860 | 13.9 |
| **Sweden** | | | | | | |
| RIX | C | F | 16.30 | 79 | 7,660 | 31.0 |
| Data-Clearing | C | F | 11.00 | 141,436 | 3,083 | 12.5 |
| **Switzerland** | | | | | | |
| SIC | C | F | 16.15 | 64,279 | 23,774 | 98.6 |
| DTA/LSV | C | F | NO | 56,704 | . | . |
| **United Kingdom** | | | | | | |
| CHAPS | D | F | 15.30 | 9,000 | 36,969 | 35.2 |
| TOWN | C | F | 15.50 | 100 | 2,576 | 2.3 |
| BACS | C | F | NO | 1,820,000 | 1,459 | 1.3 |
| Cheque/credit | D | F | NO | 2,577,000 | 2,270 | 2.2 |
| **United States** | | | | | | |
| Fedwire | D | F | 18.30 | 67,600 | 199,175 | 33.0 |
| CHIPS | C | F | 16.30 | 39,073 | 238,255 | 39.5 |

[9] Geographical access to the system: C = Centralised (one processing centre only) or D = Decentralised. [10] Prices charged to participants: F = Full costs (including investments), V = Variable costs, S = Symbolic costs (below variable costs), N = No costs. [11] Closing time for same day transactions (NO = no same day transactions). [12] Prices are set on the principle that institutions which are to benefit from on-line processing should pay the relevant charges.

Table 11

**Operating hours of selected large-value interbank funds transfer systems[1]**
**(as of August 1993)**

| System | Gross (G) or net (N) | Opening-closing time for same-day value (local time) | Settlement finality (local time) | Cut-off for all third-party payment orders | Cut-off for international correspondents' payment orders | *Memo item: Standard money market hours (local time)* |
|---|---|---|---|---|---|---|
| **Belgium** | | | | | | |
| C.E.C.[2] | N | 13:46-13:45[3] | 16:30 | 13:30 | 8:30[4] | *(9:00-16:15[5])* |
| Clearing House of Belgium | N | 9:00-16:30 | 16:30 | 13:00 | 8:30[4] | |
| **Canada**[6] | | | | | | |
| IIPS | N[7] | 8:00-16:00 | 15:00[8] | 14:30[9] | 16:00[9] | *(8:30-17:30)* |
| **France** | | | | | | |
| SAGITTAIRE | N | 8:00-13:00[10] | 18:30 | n.a. | 8:00[11] | *(8:15-17:00)* |
| TBF (planned) | G | 8:00-17:15 | 8:00-17:15 | (12) | 8:00[11] | |
| **Germany** | | | | | | |
| Express electronic credit transfer system | G | 8:30-14:30 | 8:30-14:30 | (13) | 8:00[11] | *(9:30-13:00[14])* |
| Express (paper-based) local credit transfer system | G | 8:00-12:00 | 8:00-12:00 | (13) | 8:00[11] | |
| EAF[15] | N | 8:00-12:30 | 14:30[16] | (13) | 8:00[11] | |
| **Italy**[17] | | | | | | |
| BISS | G | 8:00-17:00 | 8:00-17:00 | 17:00 | 9:00[11] | *(8:30-17:30)* |
| SIPS | N | 8:00-14:00 | 16:30 | 14:00 | 9:00[11] | |
| ME | N | 8:00-16:00 | 16:30 | 16:00 | 9:00[11] | |
| **Japan** | | | | | | |
| FEYCS | N | 9:00-13:45 | 15:00 | 10:30[11] | 10:30[11] | *(9:00-17:00)* |
| BOJ-NET | G[18] | 9:00-17:00 | 9:00-17:00 | 14:00 | n.a. | |
| **Netherlands**[19] | | | | | | |
| Central Bank FA System | G | 8:00-15:30 | 8:00-15:30 | 12:45 | n.a.[19] | *(8:00-15:30)* |
| 8007 S.W.I.F.T. | N | 8:00-11:30[20] | 13:00 | n.a.[19] | 8:00[11] | |
| **Sweden** | | | | | | |
| RIX | G[18] | 8:15-16:30[21] | 8:15-16:30[21] | 12:00[22] | 8:00[11] | *(9:00-16:00)* |
| **Switzerland** | | | | | | |
| SIC | G | 18:00-16:15[23] | 18:00-16:15[23] | 15:00[23] | 8:00[4] | *(9:00-16:00)* |
| **United Kingdom** | | | | | | |
| CHAPS | N | 8:30-15:10[24] | end of day | none | 12:00[11] | *(8:00-15:30[25])* |
| **United States**[6] | | | | | | |
| Fedwire | G | 8:30-18:30 | 8:30-18:30 | 18:00 | 18:00 | *(8:30-18:30[26])* |
| CHIPS | N | 7:00-16:30 | 18:00[27] | 16:30 | 16:30 | |
| **ECU clearing system** | N | 14:01-14:00[28] | 15:45 | none | none | *(TOM/NEXT[29])* |

## Footnotes to Table 11

(n.a. = not applicable)

[1] Some systems make no explicit distinction between large-value and retail transactions and may be used to settle interbank transfers relating to a variety of underlying transactions. Some systems may also accept payment orders for a number of value days. Money market hours indicated refer to the time period in which domestic interbank transactions are normally carried out. They therefore do not relate to particular interbank funds transfer systems.

[2] In June 1990 a special "large-value credit transfer application" was introduced in the C.E.C. All net settlements from the C.E.C. take place at the end of the day at the (manual) Clearing House of Belgium.

[3] The C.E.C. transfer system operates round-the-clock, five days a week.

[4] S.W.I.F.T. guideline.

[5] Luxembourg dealers, who are important operators in Belgian francs, are only active in the market before noon; the central bank conducts its daily fine-tuning operations at about 11:00.

[6] Eastern time.

[7] The receiving bank creates a paper document called an inter-member debit voucher either for each credit transfer received or for a daily bilateral net amount. These vouchers are delivered to the (net) sending bank in batches, for which value and volume counts are entered into the Automated Clearing and Settlement System (ACSS), operated by the Canadian Payments Association.

[8] Net settlement at 15:00 on the next day (retroactively). A decision has been made to advance this by three hours, beginning early in 1994.

[9] Local time at the receiving IIPS point, or the beneficiary account point, whichever is earlier.

[10] SAGITTAIRE'S exchange day, i.e. the period during which orders are recorded by the Bank of France, begins at 8:00 and ends at 17:30. Orders sent after 17:30 are stored by S.W.I.F.T. and processed at the start of the next exchange day. SAGITTAIRE'S accounting day starts at 13:00 on D - 1 and ends at 13:00 on D (transfers sent after 13:00 on D, regardless of whether they are processed during the same exchange day or at the start of the following exchange day, are only entered in the accounts on D + 1). The net positions of members are drawn up after the close of the accounting day.

[11] S.W.I.F.T. guideline; in practice it may be later.

[12] A cut-off for third-party orders is being discussed for the planned TBF system.

[13] This is subject to arrangements between the correspondent banks.

[14] For settlement purposes it can be later.

[15] Electronic netting system in Frankfurt for interbank transfers predominantly relating to international DM transactions.

[16] Planned time for communication of completion (positive message) or non-completion (negative message) of settlement.

[17] Lira transfers relating to international transactions are sent through SIPS and to a lesser extent through ME; net settlement of these transactions takes place through the National Clearing Procedure and ultimately through accounts at the central bank. BISS is a gross real-time settlement system which can be used for a variety of interbank transfers.

[18] The system has been designed to allow participants to enter funds transfer instructions continuously, in which case settlement takes place on the central bank's books immediately (in the case of RIX, provided they are confirmed by the counterparty). BOJ-NET, however, is also used to settle on a net basis.

[19] Interbank guilder transfers relating to international transactions are sent through the 8007 S.W.I.F.T. system which is operated by the Netherlands Bank; net settlement of these transactions takes place over the Central Bank FA System.

[20] The 8007 S.W.I.F.T. system is, for a given value day, also open from 15:00 to 17:00 on the previous business day.

[21] Closing time for new payment orders is 16:15; payments can be confirmed, and thereby settled, until 16:30.

[22] Third-party orders can be "transformed" to interbank orders, and thereby settled continuously during the whole day, if the bank and customer agree to do so. Thus, in practice the cut-off time is not applied strictly to all third-party transactions.

[23] The system is open for input 24 hours a day. Settlement services are limited by the indicated opening and closing times. A value day starts at 18:00 local time on the previous business day and ends at 16:15 on the value day. Third-party payments may be entered for same-day settlement until 15:00. Between 15:00 (cut-off 1) and 16:00 (cut-off 2) only cover (bank-to-bank) payments are accepted for same-day settlement. From 16:00 to 16:15 transactions are restricted to the processing of lombard credits (collateralised loans from the Swiss National Bank at a penalty rate).

[24] Earliest opening time is 8:30; all banks are required to be open to receive payments by 9:30.

[25] There are no standard money market hours but trading typically takes place between about 8:00 and 15:30. The market is most liquid in the morning. The Bank of England intervenes in the market as necessary between 9:45 and 15:30.

[26] Trading occurs among dealers for funds on deposit at Federal Reserve Banks (i.e. federal funds) as early as 6:30.

[27] Payments over CHIPS become final on completion of settlement, which normally occurs between 17:00 and 17:30. Rules are designed to ensure that settlement takes place no later than 18:00.

[28] ECU payment orders can be sent (for up to 28 forward value days) through S.W.I.F.T. 24 hours a day, seven days a week. At 14:00 (GMT + 1) on each value day the netting computer calculates participants' net net positions. Messages arriving after 14:00 are processed automatically for the next value day(s).

[29] There is no overnight market for ECU interbank loans. Day-to-day interbank ECU transactions are normally carried out in the Euro-markets on a TOM/NEXT basis.

Table 12

**Features of selected securities settlement systems**

(figures relate to 1992)

| | Type[1] | Owner/ Manager[2] | No. of participants | *of which direct* | Settlement of cash leg[3] | Delivery[3] |
|---|---|---|---|---|---|---|
| **Belgium** | | | | | | |
| NBB Clearing ..... | G | CB | 170 | . | N | N |
| CIK[4] ..... | E | B | 193 | | N | N |
| **Canada** | | | | | | |
| BBS[5] ..... | G,E,O | B,SE,O | 103 | 103 | N | G,N |
| **France** | | | | | | |
| SATURNE ..... | G,O | CB | 450 | 450 | N | G |
| RELIT ..... | G,E,O | B | 449 | 449 | N | G/N |
| **Germany** | | | | | | |
| DKV ..... | G,E,O | SE | | | N | G |
| **Italy** | | | | | | |
| Securities Settlement Procedures: | | | | | | |
| Daily Procedure ..... | G | CB | 348 | 348 | N | N |
| Monthly Procedure | E | CB | 287 | 287 | N | N |
| CAT ..... | G | CB | 463 | 463 | [6] | G |
| **Japan** | | | | | | |
| JGB registration ..... | G | CB | 377[7] | 377[7] | G/N | G/N |
| JGB book-entry ..... | G | CB | 299[7] | 299[7] | G/N | G/N |
| **Netherlands** | | | | | | |
| Stock Exchange ..... | G+E+O | B+CB+SE | . | . | N | N |
| CB Clearing Institute | O | CB | . | . | N | N |
| **Sweden** | | | | | | |
| VPC ..... | E | B+O | 28 | 28 | N | G |
| OM ..... | O | O | 33 | 33 | N | N |
| **Switzerland** | | | | | | |
| SECOM ..... | G,E,O | B | 441 | 441 | G | G |
| **United Kingdom** | | | | | | |
| CGO ..... | G+O | CB/SE | 14 | 14 | N | G |
| CMO ..... | O | CB | 12 | 12 | N | G |
| **United States** | | | | | | |
| Fedwire ..... | G | CB | 8,550 | 8,550 | G | G |
| DTC (NDFS)[8] ..... | E,O | B,SE,O | 532 | 532 | N | G |

[1] G = government securities, E = equity, O = other. [2] B = banks, CB = central banks, SE = stock exchange, O = other. [3] G = gross, N = net. [4] Stock exchange transactions. [5] The book-based system of The Canadian Depository for Securities Limited (CDS). [6] Deliveries free of payments. [7] End-June 1993. [8] Next-day funds settlement.

Table 12 (contd.)

| | Delivery lag | Central Securities Depository | Cash Settlement Agent | Number of transactions (thousands) | Value of transactions (USD billions)[1] | Ratio of transactions value to GDP (at annual rate) |
|---|---|---|---|---|---|---|
| **Belgium** | | | | | | |
| NBB Clearing ..... | T+2/T+5[2] | NBB | CB | 80 | 569 | 2.6 |
| CIK ..... | - [3] | CIK | CB | 750 | 10 | 0.04 |
| **Canada** | | | | | | |
| BBS[4] ..... | up to T+5 | CDS | B[5] | 9,900 | 13,200 | 23.2 |
| **France** | | | | | | |
| SATURNE ..... | T | SATURNE | CB | 137 | 1,987 | 1.5 |
| RELIT ..... | T+3[6] | SICOVAM | CB | . | 4,821 | 3.7 |
| **Germany** | | | | | | |
| DKV ..... | T+0-40 | DKV | CB | 16,500[7] | 2,990[7] | 1.7[8] |
| **Italy** | | | | | | |
| Securities Settlement Procedures: | | | | | | |
| Daily Procedure ..... | T+3 | CAT | CB | . | 3,311 | 2.7 |
| Monthly Procedure | T+15/45 | Monte Titoli | CB | . | 87 | 0.1 |
| CAT ..... | T | CAT | [9] | . | 265 | 0.2 |
| **Japan** | | | | | | |
| JGB registration ..... | T+10[10] | CB | CB | 275.6 | 6,925 | 1.9 |
| JGB book-entry ..... | T+10[10] | CB | CB | 391.9 | 15,964 | 4.3 |
| **Netherlands** | | | | | | |
| Stock Exchange ..... | T+7 | Negicef | KAS-ASS | . | 303.6 | 0.5 |
| CB Clearing Institute | T/T+7 | CB | CB | 2 | 16.2 | 0.03 |
| **Sweden** | | | | | | |
| VPC ..... | T+3 | VPC | CB | 769 | 24.5 | 0.12 |
| OM ..... | T+2 | | B | 17,155 | 1,277 | 5.2 |
| **Switzerland** | | | | | | |
| SECOM ..... | T+3 | SEGA | CB | 3,822 | 274.9 | 1.1 |
| **United Kingdom** | | | | | | |
| CGO ..... | T+1 | . | CB | 678.2 | 12,122 | 11.5 |
| CMO ..... | T | CB | CB | 247.6 | 3,628 | 3.5 |
| **United States** | | | | | | |
| Fedwire ..... | T,T+1 | CB | CB | 11,800 | 139,700 | 23.1 |
| DTC (NDFS)[11] ..... | T+5 | DTC | DTC[12] | 83,300 | 19,400 | 3.2 |

[1] Converted at yearly average exchange rate. [2] T+2 for Treasury bills; T+5 for OLOs (long-term government bonds). [3] Seller delivery. [4] The book-based system of The Canadian Depository for Securities Limited (CDS). [5] A single chartered bank. [6] When processed by the "SLAB" system (special delivery service by bilateral agreements), the delivery occurs same day. [7] Delivery versus Payment settlements only. [8] GDP for old Länder only. [9] Deliveries free of payments. [10] T+10 or less. [11] Next-day funds settlement.

Table 13

**S.W.I.F.T. traffic: intra G-10 messages flows in 1992**

(number of messages, in thousands)

| From\To | BE | CA | CH | DE | FR | GB | IT |
|---|---|---|---|---|---|---|---|
| BE ..... | 2,920 | 169 | 1,402 | 2,079 | 1,945 | 1,514 | 976 |
| CA ..... | 115 | 2,808 | 386 | 446 | 208 | 708 | 165 |
| CH ..... | 1,079 | 420 | 4,978 | 4,141 | 2,150 | 2,725 | 1,756 |
| DE ..... | 1,049 | 301 | 2,392 | 5,528 | 1,889 | 2,733 | 1,965 |
| FR ..... | 1,693 | 231 | 1,608 | 2,871 | 9,386 | 2,319 | 2,245 |
| GB ..... | 1,398 | 857 | 2,697 | 4,569 | 2,260 | 11,539 | 1,872 |
| IT ..... | 803 | 140 | 1,650 | 2,755 | 2,084 | 1,834 | 3,465 |
| JP ..... | 154 | 243 | 477 | 1,032 | 416 | 1,574 | 373 |
| NL ..... | 1,316 | 115 | 1,147 | 2,423 | 683 | 1,199 | 490 |
| SE ..... | 177 | 34 | 265 | 933 | 240 | 745 | 205 |
| US ..... | 1,217 | 1,946 | 3,929 | 4,898 | 2,227 | 5,996 | 1,925 |
| **Total G-10** ..... | 11,922 | 7,263 | 20,931 | 31,673 | 23,489 | 32,886 | 15,438 |
| **Total non-G-10** .. | 3,164 | 1,279 | 4,875 | 13,214 | 4,971 | 9,296 | 4,571 |
| **Total all countries** | 15,087 | 8,542 | 25,805 | 44,888 | 28,460 | 42,182 | 20,009 |

| From\To | JP | NL | SE | US | Total G-10 | Non-G-10 | All countries |
|---|---|---|---|---|---|---|---|
| BE ..... | 258 | 1,680 | 180 | 1,759 | 14,882 | 3,215 | 18,097 |
| CA ..... | 262 | 67 | 30 | 2,442 | 7,637 | 1,563 | 9,200 |
| CH ..... | 524 | 909 | 231 | 4,467 | 23,379 | 5,456 | 28,835 |
| DE ..... | 786 | 1,465 | 493 | 4,229 | 22,830 | 9,756 | 32,585 |
| FR ..... | 476 | 921 | 226 | 3,168 | 25,145 | 5,165 | 30,311 |
| GB ..... | 2,185 | 1,177 | 617 | 8,658 | 37,829 | 10,338 | 48,168 |
| IT ..... | 400 | 572 | 176 | 2,700 | 16,579 | 4,565 | 21,144 |
| JP ..... | 2,363 | 132 | 64 | 5,289 | 12,116 | 5,679 | 17,795 |
| NL ..... | 142 | 1,763 | 156 | 1,736 | 11,171 | 2,377 | 13,548 |
| SE ..... | 98 | 204 | 995 | 1,008 | 4,902 | 2,187 | 7,089 |
| US ..... | 4,373 | 1,839 | 703 | 10,949 | 40,001 | 24,992 | 64,993 |
| **Total G-10** ..... | 11,866 | 10,729 | 3,870 | 46,405 | 216,473 | 75,292 | 291,765 |
| **Total non-G10** ... | 5,379 | 2,136 | 2,009 | 24,577 | 75,471 | 38,305 | 113,776 |
| **Total all countries** | 17,245 | 12,866 | 5,880 | 70,982 | 291,944 | 113,597 | 405,541 |

*Source*: S.W.I.F.T.

## Annex 2

# GLOSSARY

## LIST OF TERMS AND ABBREVIATIONS*

**Advisory netting:** see position netting.

**Assured payment system (APS):** an arrangement in an exchange-for-value system under which completion of timely settlement of a payment instruction is supported by an irrevocable and unconditional commitment from a third party (typically a bank, syndicate of banks or clearing house). See exchange-for-value settlement system.

**Automated clearing house (ACH):** an electronic clearing system in which payment orders are exchanged among financial institutions, primarily via magnetic media or telecommunication networks, and handled by a data-processing centre. See also clearing.

**Automated teller machine (ATM):** electro-mechanical device that permits authorised users, typically using machine-readable plastic cards, to withdraw cash from their accounts and/or access other services, such as balance enquiries, transfer of funds or acceptance of deposits. ATMs may be operated either on-line with real-time access to an authorisation database or off-line.

**Bank draft:** in Europe, the term generally refers to a draft drawn by a bank on itself. The draft is purchased by the payer and sent to the payee, who presents it to his bank for payment. That bank presents it to the payer's bank for reimbursement. In the United States, the term generally refers to a draft or cheque drawn by a bank on itself or on funds deposited with another bank. In the case of a cashier's cheque, the bank is both the drawer and drawee. In the case of a teller's cheque, one bank is the drawer and a second bank is the drawee. Bank drafts may be written by a bank for its own purposes or may be purchased by a customer and sent to a payee to discharge an obligation. See draft.

**Batch:** the transmission or processing of a group of payment orders and/or securities transfer instructions as a set at discrete intervals of time.

**Beneficial ownership/interest:** the entitlement to receive some or all of the benefits of ownership of a security or other financial instrument (e.g. income, voting rights, power to transfer). Beneficial ownership is usually distinguished from "legal ownership" of a security or financial instrument. See legal ownership.

**Bilateral net settlement system:** a settlement system in which participants' bilateral net settlement positions are settled between every bilateral combination of participants. See also net credit or debit position.

**Bilateral netting:** an arrangement between two parties to net their bilateral obligations. The obligations covered by the arrangement may arise from financial contracts, transfers or both. See netting, multilateral netting, net settlement.

**Bill of exchange:** a written order from one party (the drawer) to another (the drawee) to pay a specified sum on demand or on a specified date to the drawer or to a third party specified by the drawer. Widely used to finance trade and, when discounted with a financial institution, to obtain credit. See also draft.

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* This glossary gives an explanation of terms used in the payments context on the basis of best consensus between the central banks involved (G-10 and EC). It does not attempt to provide precise legal definitions. It is recognised that it may not always be possible to find an exact equivalent for each term in other languages.

**Book-entry system:** an accounting system that permits the transfer of claims (e.g. securities) without the physical movement of paper documents or certificates. See also dematerialisation, immobilisation.

**Bulk transfer system:** see retail transfer system.

**Call money:** a loan contract which is automatically renewed every day unless the lender or the borrower indicates that it wishes the funds to be returned within a short period of time.

**Capital risk:** see principal risk.

**Caps:** for risk management purposes, the quantitative limits placed on the positions (debit or credit positions, which may be either net or gross) that participants in a funds or securities transfer system can incur during the business day. Caps may be set by participants on credit extended bilaterally to other participants in a system, e.g. bilateral credit limits, or by the system operator or by the body governing the transfer system on the aggregate net debit a participant may incur on the system, e.g. sender net debit limits. Sender net debit limits may be either collateralised or uncollateralised.

**Card:** see cash card, cheque guarantee card, chip card, credit card, debit card, delayed debit card, prepaid card, retailer's card, travel and entertainment card.

**Cash card:** card for use only in ATMs or cash dispensers (often, other cards also have a cash function that permits the holder to withdraw cash).

**Cash dispenser:** electro-mechanical device that permits consumers, typically using machine-readable plastic cards, to withdraw banknotes (currency) and, in some cases, coins. See also automated teller machine (ATM).

**Cashier's cheque:** see bank draft.

**Central bank credit (liquidity) facility:** a standing credit facility that can be drawn upon by certain designated account holders (e.g. banks) at the central bank. In some cases, the facility can be used automatically at the initiative of the account holder, while in other cases the central bank may retain some degree of discretion. The loans typically take the form either of advances or overdrafts on an account holder's current account which may be secured by a pledge of securities (also known as lombard loans in some European countries), or of traditional rediscounting of bills.

**Central securities depository:** a facility for holding securities which enables securities transactions to be processed by book entry. Physical securities may be immobilised by the depository or securities may be dematerialised (i.e. so that they exist only as electronic records). In addition to safekeeping, a central securities depository may incorporate comparison, clearing and settlement functions.

**Certificate:** physical document which evidences an ownership claim in, indebtedness of, or other outstanding financial obligations of the issuer.

**Chaining:** a method used in certain transfer systems (mostly for securities) for processing instructions. It involves the manipulation of the sequence in which transfer instructions are processed to increase the number or value of transfers that may be settled with available funds and/or securities balances (or available credit or securities lending lines).

**Charge card:** see travel and entertainment card.

**Cheque:** a written order from one party (the drawer) to another (the drawee, normally a bank) requiring the drawee to pay a specified sum on demand to the drawer or to a third party specified by the drawer. Widely used for settling debts and withdrawing money from banks. See also bill of exchange.

**Cheque guarantee card:** a card issued as part of a cheque guarantee system. This function may be combined with other functions in the same card, e.g. those of a cash card or debit card. See also cheque guarantee system.

**Cheque guarantee system:** a system to guarantee cheques, typically up to a specified amount, that have been validated by the merchant either on the basis of a card issued to the cheque writer or through a central database accessible to merchants. Validated cheques are guaranteed by the issuer of the guarantee card, the drawee bank or the system operator.

**Chip card:** also known as an IC (integrated circuit) card or smart card. A card containing one or more computer chips or integrated circuits for identification, data storage or special-purpose processing used to validate personal identification numbers (PINs), authorise purchases, verify account balances and store personal records. In some cases, the memory in the card is updated every time the card is used, e.g. an account balance is updated.

**Clearing/Clearance:** clearing is the process of transmitting, reconciling and in some cases confirming payment orders or security transfer instructions prior to settlement, possibly including netting of instructions and the establishment of final positions for settlement. In the context of securities markets this process is often referred to as clearance. Sometimes the terms are used (imprecisely) to include settlement.

**Clearing house:** a central location or central processing mechanism through which financial institutions agree to exchange payment instructions or other financial obligations (e.g. securities). The institutions settle for items exchanged at a designated time based on the rules and procedures of the clearing house. In some cases, the clearing house may assume significant counterparty, financial or risk management responsibilities for the clearing system. See clearing/clearance, clearing system.

**Clearing house funds:** term most commonly used in certain US markets to refer to funds that typically are provisional on the day of receipt and final on the following day. More specifically, the term is used to refer to monetary claims with next-day finality that are exchanged by participants in certain clearing house arrangements in settlement of obligations arising from the clearing process. Such claims are typically transferred via cheques, drafts or other similar payment instruments.

**Clearing system:** a set of procedures whereby financial institutions present and exchange data and/or documents relating to funds or securities transfers to other financial institutions at a single location (clearing house). The procedures often also include a mechanism for the calculation of participants' bilateral and/or multilateral net positions with a view to facilitating the settlement of their obligations on a net or net net basis. See also netting.

**Comparison:** see matching.

**Confirmation:** a particular connotation of this widely used term is the process whereby a market participant notifies its counterparties or customers of the details of a trade and, typically, allows them time to affirm or to question the trade.

**Correspondent banking:** an arrangement under which one bank (correspondent) holds deposits owned by other banks (respondents) and provides payment and other services to those respondent banks. Such arrangements may also be known as agency relationships in some domestic contexts. In international banking, balances held for a foreign respondent bank may be used to settle foreign exchange transactions. Reciprocal correspondent banking relationships may involve the use of so-called nostro and vostro accounts to settle foreign exchange transactions.

**Counterparty:** the opposite party to a financial transaction, such as a securities trade or swap agreement.

**Credit caps:** see caps.

**Credit card:** card indicating that the holder has been granted a line of credit. It enables him to make purchases and/or draw cash up to a prearranged ceiling; the credit granted can be settled in full by the end of a specified period or can be settled in part, with the balance taken as extended credit. Interest is charged on the amount of any extended credit and the holder is sometimes charged an annual fee.

**Credit card company:** a company which owns the trademark of a particular credit card, and may also provide a number of marketing, processing or other services to the members using the card services.

**Credit risk/exposure:** the risk that a counterparty will not settle an obligation for full value, either when due or at any time thereafter. In exchange-for-value systems, the risk is generally defined to include replacement cost risk and principal risk.

**Credit transfer:** a payment order or possibly a sequence of payment orders made for the purpose of placing funds at the disposal of the beneficiary. Both the payment instructions and the funds described therein move from the bank of the payer/originator to the bank of the beneficiary, possibly via several other banks as intermediaries and/or more than one credit transfer system.

**Credit transfer system (or giro system):** a system through which payment instructions and the funds described therein may be transmitted for the purpose of effecting credit transfers.

**Cross-currency settlement risk (or Herstatt risk):** see principal risk.

**Custody:** the safekeeping and administration of securities and financial instruments on behalf of others.

**Daylight credit (or daylight overdraft, daylight exposure, intraday credit):** credit extended for a period of less than one business day; in a credit transfer system with end-of-day final settlement, daylight credit is tacitly extended by a receiving institution if it accepts and acts on a payment order even though it will not receive final funds until the end of the business day.

**Debit caps:** see caps.

**Debit card:** card enabling the holder to have his purchases directly charged to funds on his account at a deposit-taking institution (may sometimes be combined with another function, e.g. that of a cash card or cheque guarantee card).

**Debit transfer system (or debit collection system):** a funds transfer system in which debit collection orders made or authorised by the payer move from the bank of the payee to the bank of the payer and result in a charge (debit) to the account of the payer; for example, cheque-based systems are typical debit transfer systems.

**Default:** failure to complete a funds or securities transfer according to its terms for reasons that are not technical or temporary, usually as a result of bankruptcy. Default is usually distinguished from a "failed transaction".

**Delayed debit card:** card issued by banks indicating that the holder may charge his account up to an authorised limit. It enables him to make purchases but does not offer extended credit, the full amount of the debt incurred having to be settled at the end of a specified period. The holder is usually charged an annual fee.

**Deletion:** a mechanism whereby some or all transfers to/from a defaulting participant are excluded from the settlement process. In a netting scheme, other participants' bilateral and/or multilateral net positions are recalculated. See unwinding.

**Delivery:** final transfer of a security or financial instrument.

**Delivery versus payment system (or DVP, delivery against payment):** a mechanism in an exchange-for-value settlement system that ensures that the final transfer of one asset occurs if and only if the final transfer of (an)other asset(s) occurs. Assets could include monetary assets (such as foreign exchange), securities or other financial instruments. See exchange-for-value settlement system, final transfer.

**Dematerialisation:** the elimination of physical certificates or documents of title which represent ownership of securities so that securities exist only as accounting records.

**Direct debit:** a pre-authorised debit on the payer's bank account initiated by the payee.

**Direct participant/member:** the term generally denotes participants in a funds or securities transfer system that directly exchange transfer orders with other participants in the system. In some systems direct participants also exchange orders on behalf of indirect participants. Depending on the system, direct participants may or may not also be settling participants. In the EC context this term has a specific meaning: it refers to participants in a transfer system which are responsible to the settlement institution (or to all other participants) for the settlement of their own payments, those of their customers and those of indirect participants on whose behalf they are settling. See participant/member, indirect participant/member, settling participant/member.

**Discharge:** release from a legal obligation imposed by contract or law.

**Draft:** a written order from one party (the drawer) to another (the drawee) to pay a party identified on the order (payee) or to bearer a specified sum, either on demand (sight draft) or on a specified date (time draft). See cheque, bank draft, bill of exchange.

**EFTPOS:** see point of sale (POS).

**Electronic data interchange (EDI):** the electronic exchange between commercial entities (in some cases also public administrations), in a standard format, of data relating to a number of message categories, such as orders, invoices, customs documents, remittance advices and payments. EDI messages are sent through public data transmission networks or banking system channels. Any movement of funds initiated by EDI is reflected in payment instructions flowing through the banking system. EDIFACT, a United Nations body, has established standards for electronic data interchange.

**Exchange-for-value settlement system:** system which involves the exchange of assets, such as money, foreign exchange, securities or other financial instruments, in order to discharge settlement obligations. These systems may use one or more funds transfer systems in order to satisfy the payment obligations that are generated. The links between the exchange of assets and the payment system(s) may be manual or electronic. See delivery versus payment system.

**Face-to-face payment:** payment carried out by the exchange of instruments between the payer and the payee in the same physical location.

**Failed transaction:** a transaction (e.g. a funds or securities transfer) that does not settle on time, usually for technical or temporary reasons.

**Final (finality):** irrevocable and unconditional.

**Final settlement:** settlement which is irrevocable and unconditional.

**Final transfer:** an irrevocable and unconditional transfer which effects a discharge of the obligation to make the transfer. The terms "delivery" and "payment" are each defined to include a final transfer.

**Giro system:** see credit transfer system.

**Gridlock:** a situation that can arise in a funds or securities transfer system in which the failure of some transfer instructions to be executed (because the necessary funds or securities balances are unavailable) prevents a substantial number of other instructions from other participants from being executed. See also failed transaction, queuing, systemic risk.

**Gross settlement system:** a transfer system in which the settlement of funds or securities transfers occurs individually on an order-by-order basis according to the rules and procedures of the system, i.e. without netting debits against credits. See real-time gross settlement, net settlement system.

**Haircut:** the difference between the market value of a security and its collateral value. Haircuts are taken by a lender of funds in order to protect the lender, should the need arise to liquidate the collateral, from losses owing to declines in the market value of the security. See margin.

**Herstatt risk:** see principal risk.

**Home banking:** banking services which a retail customer of a financial institution can access using a telephone, television set, terminal or personal computer as a telecommunication link to the institution's computer centre.

**IC card**: see chip card.

**Immobilisation:** Placement of certificated securities and financial instruments in a central securities depository to facilitate book-entry transfers.

**Imprinter:** mechanical device to reproduce the name and account number of a cardholder on a paper sales slip. See also imprinter voucher.

**Imprinter voucher:** in card transactions, a sales slip that is to be signed by the customer on which the name and card number of the customer are imprinted. See also imprinter.

**Indirect participant/member:** refers to a funds or securities transfer system in which there is a tiering arrangement. Indirect participants are distinguished from direct participants by their inability to perform some of the system activities (e.g. input of transfer orders, settlement) performed by direct participants. Indirect participants, therefore, require the services of direct participants to perform those activities on their behalf. In the EC context the term refers more specifically to participants in a transfer system which are responsible only to their direct participants for settling the payments input to the system. See direct participant/member, settling participant/member, tiering arrangement.

**Interbank funds transfer system (IFTS):** a funds transfer system in which most (or all) direct participants are financial institutions, particularly banks and other credit institutions.

**Intraday credit:** see daylight credit.

**Irrevocable and unconditional transfer:** a transfer which cannot be revoked by the transferor and is unconditional.

**Issuer:** the entity which is obligated on a security or other financial instrument. For example, a corporation or government having the authority to issue and sell a security; a bank that approves a letter of credit. Sometimes used to refer to a financial institution that issues credit or debit cards.

**Large-value funds transfer system:** interbank funds transfer system through which large-value and high-priority funds transfers are made between participants in the system for their own account or on behalf of their customers. Though as a rule no minimum value is set for the payments they carry, the average size of payments through such systems is relatively large. Large-value funds transfer systems are sometimes called wholesale funds transfer systems.

**Legal ownership:** recognition in law as the owner of a security or other financial instrument.

**Letter of credit (L/C):** a promise by a bank or other issuer to a third party to make payment on behalf of a customer in accordance with specified conditions. Frequently used in international trade to make funds available in a foreign location.

**Liquidity risk:** the risk that a counterparty (or participant in a settlement system) will not settle an obligation for full value when due. Liquidity risk does not imply that a counterparty or participant is insolvent since it may be able to settle the required debit obligations at some unspecified time thereafter.

**Loss-sharing rule (or loss-sharing agreement):** an agreement between participants in a transfer system or clearing house arrangement regarding the allocation of any loss arising when one or more participants fail to fulfil their obligation: the arrangement stipulates how the loss will be shared among the parties concerned in the event that the agreement is activated.

**Magnetic ink character recognition (MICR):** a technique, using special MICR machine-readable characters, by which documents (i.e. cheques, credit transfers, direct debits) are read by machines for electronic processing. See optical character recognition (OCR).

**Margin:** margin has at least two meanings. In the futures/commodity markets, margin is a good faith deposit (of money, securities or other financial instruments) required by the futures clearing system to assure performance. In the equities markets, margin is a sum of money deposited by a customer when borrowing money from a broker to purchase shares. The money deposited with the broker is the difference between the purchase value of the shares and the collateral value of the shares. See haircut.

**Marking to market:** the practice of revaluing securities and financial instruments using current market prices. In some cases unsettled contracts to purchase and sell securities are marked to market and the counterparty with an as yet unrealised loss on the contract is required to transfer funds or securities equal to the value of the loss to the other counterparty.

**Matching (or comparison checking):** the process used by market participants before settlement of a transaction to ensure that they agree with respect to the terms of the transaction.

**Money order:** an instrument used to remit money to the named payee, often used by persons who do not have a chequing account relationship with a financial institution, to pay bills or to transfer money to another person or to a company. There are three parties to a money order: the remitter (payer), the payee and the drawee. Drawees are usually financial institutions or post offices. Payees can either cash their money orders or present them to their bank for collection.

**Multilateral net settlement position:** the sum of the value of all the transfers a participant in a net settlement system has received during a certain period of time less the value of the transfers made by the participant to all other participants. If the sum is positive, the participant is in a multilateral net credit position; if the sum is negative, the participant is in a multilateral net debit position.

**Multilateral net settlement system:** a settlement system in which each settling participant settles (typically by means of a single payment or receipt) the multilateral net settlement position which results from the transfers made and received by it, for its own account and on behalf of its customers or non-settling participants for which it is acting. See multilateral netting, multilateral net settlement position, settling participant and direct participant.

**Multilateral netting:** an arrangement among three or more parties to net their obligations. The obligations covered by the arrangement may arise from financial contracts, transfers or both. The multilateral netting of payment obligations normally takes place in the context of a multilateral net settlement system. See bilateral netting, multilateral net settlement position, multilateral net settlement system.

**Net credit or debit position:** a participant's net credit or net debit position in a netting system is the sum of the value of all the transfers it has received up to a particular point in time less the value of all transfers it has sent. If the difference is positive, the participant is in a net credit position; if the difference is negative, the participant is in a net debit position. The net credit or net debit position at settlement time is called the net settlement position. These net positions may be calculated on a bilateral or multilateral basis.

**Net debit cap:** see caps, net credit or debit position.

**Net settlement:** the settlement of a number of obligations or transfers between or among counterparties on a net basis. See netting.

**Net settlement system:** a system to effect net settlement.

**Netting:** an agreed offsetting of positions or obligations by trading partners or participants. The netting reduces a large number of individual positions or obligations to a smaller number of obligations or positions. Netting may take several forms which have varying degrees of legal enforceability in the event of default of one of the parties. See also bilateral and multilateral netting, position netting, novation, substitution.

**Nominee:** a person or entity named by another to act on his behalf.

**Novation:** satisfaction and discharge of existing contractual obligations by means of their replacement by new obligations (whose effect, for example, is to replace gross with net payment obligations). The parties to the new obligations may be the same as to the existing obligations or, in the context of some clearing house arrangements, there may additionally be substitution of parties. See substitution.

**Obligation:** a duty imposed by contract or law. It is also used to describe a security or other financial instrument, such as a bond or promissory note, which contains the issuer's undertaking to pay the owner.

**Off-line:** in the context of payment and settlement systems, the term may refer to the transmission of transfer instructions by users, through such means as voice, written or telefaxed instructions, that must subsequently be input into a transfer processing system. The term may also refer to the storage of data by the transfer processing system on media such as magnetic tape or disk such that the user may not have direct and immediate access to the data. See on-line.

**On-line:** in the context of payment and settlement systems, the term may refer to the transmission of transfer instructions by users, through such electronic means as computer-to-computer interfaces or electronic terminals, that are entered into a transfer processing system by automated means. The term may also refer to the storage of data by the transfer processing system on a computer database such that the user has direct access to the data (frequently real-time) through input/output devices such as terminals. See off-line.

**Optical character recognition (OCR):** a technique, using special OCR machine-readable characters, by which documents (e.g. cheques, credit transfers, direct debits) are read by machines for electronic processing. See magnetic ink character recognition (MICR).

**Overnight money (or day-to-day money):** a loan with a maturity of one business day.

**Paperless credit transfers:** credit transfers that do not involve the exchange of paper documents between banks. Other credit transfers are called paper-based.

**Participant/Member:** a party who participates in a transfer system. This generic term refers to an institution which is identified by a transfer system (e.g. by a bank identification number) and is allowed to send payment orders directly to the system or which is directly bound by the rules governing the transfer system. See direct participant/member, indirect participant/member.

**Payment:** the payer's transfer of a monetary claim on a party acceptable to the payee. Typically, claims take the form of banknotes or deposit balances held at a financial institution or at a central bank.

**Payment lag:** the time-lag between the initiation of the payment order and its final settlement.

**Payment order (or payment instruction):** an order or message requesting the transfer of funds (in the form of a monetary claim on a party) to the order of the payee. The order may relate either to a credit transfer or to a debit transfer.

**Payment system:** a payment system consists of a set of instruments, banking procedures and, typically, interbank funds transfer systems that ensure the circulation of money.

**PIN (personal identification number):** a numeric code which the cardholder may need to quote for verification of identity. In eletronic transactions, it is seen as the equivalent of a signature.

**Point of sale (POS):** this term refers to the use of payment cards at a retail location (point of sale). The payment information is captured either by paper vouchers or by electronic terminals, which, in some cases, are designed also to transmit the information. Where this is so, the arrangement may be referred to as "electronic funds transfer at the point of sale" (EFTPOS).

**Position netting (or advisory netting):** the netting of instructions in respect of obligations between two or more parties which neither satisfies nor discharges those original individual obligations. Also referred to as payment netting in the case of payment instructions.

**Prepaid card (or payment card):** a card "loaded" with a given value, paid for in advance.

**Principal risk:** the credit risk that a party will lose the full value involved in a transaction. In the settlement process, this term is typically associated with exchange-for-value transactions when there is a lag between the final settlement of the various legs of a transaction (i.e. the absence of delivery versus payment). Principal risk that arises from the settlement of foreign exchange transactions is sometimes called cross-currency settlement risk or Herstatt risk. See credit risk.

**Provisional transfer:** a conditional transfer in which one or more parties retain the right by law or agreement to rescind the transfer.

**Queuing:** a risk management arrangement whereby transfer orders are held pending by the originator/deliverer or by the system until sufficient cover is available in the originator's/deliverer's clearing account or under the limits set against the payer; in some cases, cover may include unused credit lines or available collateral. See also caps.

**Real-time gross settlement (RTGS):** a gross settlement system in which processing and settlement take place in real time (continuously).

**Real-time transmission, processing or settlement:** the transmission, processing or settlement of a funds or securities transfer instruction on an individual basis at the time it is initiated.

**Receiver finality:** analytical rather than operational or legal term used to describe the point at which an unconditional obligation arises on the part of the receiving participant in a transfer system to make final funds available to its beneficiary customer on the value date. See final settlement.

**Registration:** the listing of ownership of securities in the records of the issuer or its transfer agent/registrar.

**Remote participant:** a participant in a transfer system which has neither its head office nor any of its branches located in the country where the transfer system is based.

**Remote payment:** payment carried out through the sending of payment orders or payment instruments (e.g. by mail). Contrast with face-to-face payment.

**Replacement cost risk (or market risk, price risk):** the risk that a counterparty to an outstanding transaction for completion at a future date will fail to perform on the settlement date. This failure may leave the solvent party with an unhedged or open market position or deny the solvent party unrealised gains on the position. The resulting exposure is the cost of replacing, at current market prices, the original transaction. See also credit risk.

**Respondent:** see correspondent banking.

**Retailer's card:** a card issued by non-banking institutions, to be used in specified stores. The holder of the card has usually been granted a line of credit.

**Retail transfer system:** interbank funds transfer system which handles a large volume of payments of relatively low value in such forms as cheques, credit transfers, direct debits, ATM transactions and EFT at the point of sale.

**Same-day funds:** money balances that the recipient has a right to transfer or withdraw from an account on the day of receipt.

**Securities depository (book-entry system):** see central securities depository.

**Sender finality:** analytical rather than operational or legal term used to describe the point at which an unconditional obligation arises on the part of the initiating participant in a funds transfer system to make final payment to the receiving participant on the value date. See final settlement.

**Settlement:** an act that discharges obligations in respect of funds or securities transfers between two or more parties. See gross and net settlement system, net settlement, final settlement.

**Settlement agent:** an institution that manages the settlement process (e.g. the determination of settlement positions, monitoring the exchange of payments, etc.) for transfer systems or other arrangements that require settlement. See final settlement, settlement, settlement institution(s), multilateral net settlement system.

**Settlement finality:** see final settlement.

**Settlement institution(s):** the institution(s) across whose books transfers between participants take place in order to achieve settlement within a settlement system. See settling participant/member, settlement agent, multilateral net settlement system, bilateral net settlement system.

**Settlement lag:** in an exchange-for-value process, the time-lag between entering into a trade/bargain and its discharge by the final exchange of a financial asset for payment. See payment lag.

**Settling participant/member:** in some countries, a settling participant in a funds or securities transfer system delivers and receives funds or securities to/from other settling participants through one or more accounts at the settlement institution for the purpose of settling funds or securities transfers for the system. Other participants require the services of a settling participant in order to settle their positions. Currently in the EC direct participants are by definition also settling participants. See direct participant/member, tiering arrangement.

**Settlement risk:** general term used to designate the risk that settlement in a transfer system will not take place as expected. This risk may comprise both credit and liquidity risk.

**Settlement system:** a system in which settlement takes place.

**Standing order:** an instruction from a customer to his bank to make a regular payment of a fixed amount to a named creditor.

**Substitution:** The substitution of one party for another in respect of an obligation. In a netting and settlement context the term typically refers to the process of amending a contract between two parties so that a third party is interposed as counterparty to each of the two parties and the original contract between the two parties is satisfied and discharged. See novation.

**S.W.I.F.T. (Society for Worldwide Interbank Financial Telecommunication):** a cooperative organisation created and owned by banks that operates a network which facilitates the exchange of payment and other financial messages between financial institutions (including broker-dealers and securities companies) throughout the world. A S.W.I.F.T. payment message is an instruction to transfer funds; the exchange of funds (settlement) subsequently takes place over a payment system or through correspondent banking relationships.

**Systemic risk:** the risk that the failure of one participant in a transfer system, or in financial markets generally, to meet its required obligations will cause other participants or financial institutions to be unable to meet their obligations (including settlement obligations in a transfer system) when due. Such a failure may cause significant liquidity or credit problems and, as a result, might threaten the stability of financial markets.

**Telematics:** the combined use of data-processing and data-transmission techniques.

**Teller's cheque:** see bank draft.

**Tiering arrangement:** an arrangement which may exist in a funds or securities transfer system whereby participants in one category require the services of participants in another category to exchange and/or settle their transactions. See direct, indirect and settling participant/member.

**Trade date:** the date on which a trade/bargain is struck.

**Trade netting:** a consolidation and offsetting of individual trades into net amounts of securities and money due between trading partners or among members of a clearing system. A netting of trades which is not legally enforceable is a position netting.

**Trade-for-trade (gross) settlement:** the settlement of individual transactions between counterparties. See gross settlement system.

**Trade-for-trade settlement system:** see gross settlement system.

**Transfer:** operationally, the sending (or movement) of funds or securities or of a right relating to funds or securities from one party to another party by (1) conveyance of physical instruments/money; (2) accounting entries on the books of a financial intermediary; or (3) accounting entries processed through a funds and/or securities transfer system. The act of transfer affects the legal rights of the transferor, transferee and possibly third parties in relation to the money balance, security or other financial instrument being transferred.

**Transfer system:** a generic term covering interbank funds transfer systems and exchange-for-value systems.

**Travel and entertainment (charge) card:** card issued by non-banks indicating that the holder has been granted a line of credit. It enables him to make purchases but does not offer extended credit, the full amount of the debt incurred having to be settled at the end of a specified period. The holder is usually charged an annual fee.

**Truncation:** a procedure in which the physical movement of paper payment instruments (e.g. paid cheques or credit transfers) within a bank, between banks or between a bank and its customer is curtailed or eliminated, being replaced, in whole or in part, by electronic records of their content for further processing and transmission.

**Ultimate settlement:** sometimes used to denote final settlement in central bank money.

**Unwinding (or settlement unwind):** a procedure followed in certain clearing and settlement systems in which transfers of securities or funds are settled on a net basis, at the end of the processing cycle, with all transfers provisional until all participants have discharged their settlement obligations. If a participant fails to settle, some or all of the provisional transfers involving that participant are deleted from the system and the settlement obligations from the remaining transfers are then recalculated. Such a procedure has the effect of transferring liquidity pressures and possibly losses from the failure to settle to other participants, and may, in the extreme, result in significant and unpredictable systemic risks.

**Variation margin (or mark-to-market payments):** the amount which is paid by a counterparty to reduce replacement cost exposures resulting from changes in market prices, following the revaluation of securities or financial instruments that are the subject of unsettled trades.

**Wholesale funds transfer system:** see large-value funds transfer system.

## Annex 3

# EDITORIAL GROUP MEMBERS

# MEMBERS OF THE EDITORIAL GROUP RESPONSIBLE FOR THE 1993 EDITION OF THE RED BOOK

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