

PART II - PAYMENT SYSTEMS IN INDIVIDUAL COUNTRIES

1. B E L G I U M



I. SUMMARY OF THE MAIN FEATURES

1. Different types of payment media exist side by side in Belgium. Firstly there is, of course, currency. By comparison with the Anglo-Saxon countries the proportion of the money supply (M1) accounted for by currency is high, but it has been declining steadily for the past twenty years or so.

Partly under the influence of the banks and partly also as a result of legislative measures, the use of deposit money has spread rapidly in the past twenty years or so. The cheque and the credit transfer are now very widely used by the general public.

Two other types of payment mechanism operated by the Postal Cheque Office, the postal draft (assignation postale) and the inpayment transfer (bulletin de versement), are also used frequently.

In response to the growing cost of document processing the financial institutions have made efforts to rationalise and automate operations as far as possible, and in the area of payment media they have developed in particular the systematic collection of domiciled invoices (encaissement systématique des factures domiciliées), the coded message transfer (virement à communication structurée), the standing order (ordre permanent de paiement) and the quasi-standing order (ordre semi-permanent de paiement).

The first network of automated teller machines was introduced in 1978; two others started operating in 1979.

In the second half of 1979 a group of banks set up a small network of point-of-sale (POS) terminals on an experimental basis.

In addition, the financial institutions have encouraged corporate customers delivering payment orders (e.g. for the payment of salaries) to switch from paper media to carriers that can be processed automatically (magnetic tapes, diskettes, cassettes).

2. The Belgian financial sector can be divided into three categories of institution: the commercial banks, the private savings banks and the public credit institutions. The National Bank of Belgium is both a public institution and a limited company; its rôle is fundamentally different from that of the other institutions just mentioned.

The large financial institutions in particular began very early to automate the processing of their operations, equipping their head offices, and sometimes regional main offices, with computers. Their branches, too, are often equipped with terminals linked directly to a central computer.

Payments between financial institutions are effected through clearing houses set up at the National Bank of Belgium's Brussels and provincial offices.

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3. On the initiative of the National Bank of Belgium a number of protocols defining standards for codes and documents have been signed by all the institutions in the Belgian financial sector. The eighth protocol, signed in 1974, led to the creation of a non-profit-making organisation called the Clearing Centre for the Belgian Financial System (CEC), which has introduced a system of automated processing of the data relating to cheques and credit transfers exchanged in the clearing houses (cheque and credit transfer truncation).

The National Bank of Belgium chairs the CEC. It co-ordinates the activities of all the working parties set up under the CEC's auspices and leases the services of its computer centre for the execution of the day-to-day operations.

Studies in a number of areas are under way with a view to broadening the CEC's activities and the services it provides, including the automated processing of domiciled invoices (scheduled to start in September 1980), the use of diskettes (scheduled for February 1980), processing of operations at any time (scheduled for 1981) and the creation of a telecommunications network linking the financial institutions and the CEC.

## II. PRINCIPAL TYPES OF PAYMENT MEDIA USED IN BELGIUM

### 1. Cash payments

The National Bank of Belgium holds the legal privilege of issuing bank-notes in denominations of 100 francs and over. Lower-denomination notes and all coins are also issued by the Bank, but on behalf of the Treasury.

At present bank-notes in denominations of 5,000, 1,000, 500, 100, 50 and 20 francs, and coins of 250, 20, 10, 5, 1, 0.50 and 0.25 francs are legal tender, unlimited except in the case of coins of 20 francs and less. It may be noted that Belgian currency is also legal tender in the Grand-Duchy of Luxembourg, where, moreover, it accounts for the bulk of currency in circulation.

Notes and coins are put into circulation by the National Bank of Belgium almost exclusively through the other financial institutions. In order to obtain cash the latter transfer assets (claims on companies, financial intermediaries of the state, or foreign assets) to the central bank.

At the end of 1978 the total value of currency issued was B.fr. 372.5 billion, representing an increase of 7.2 per cent. compared with the end of 1977.

In 1978 the share of the total money supply (M1) accounted for by currency worked out at an average of 41.9 per cent., compared with 49.2

per cent. ten years earlier, and now the public generally uses cash only for low-value day-to-day transactions.

There are at present three networks of automated teller machines in Belgium, of which two are run by a group of financial institutions, while the third, set up in the second half of 1979 with machines installed in post offices, is run by the Postal Cheque Office. As yet they consist of little more than bank-note dispensers installed in very busy locations. However, their functions will be broadened to include transfers between accounts, the ordering of cheque books, etc. These three networks are not at present compatible.

While the relative importance of currency as compared with cashless payment media will very probably continue to decline, bank-notes and coin will not disappear. For small payments between individuals or between consumers and tradesmen currency is certain to remain the most practical payment instrument.

## 2. Cashless and hybrid payments

### 2.1 Deposit money

The past two decades have seen a significant growth in the use of deposit money. Its share in the total money supply (M1) has expanded steadily, averaging 58.1 per cent. in 1978, against only 50.8 per cent. in 1968. There are various reasons for this remarkable advance.

The financial institutions are themselves principally responsible for the success of deposit money. Intensive publicity campaigns, particularly to encourage the use of deposit money for the payment of salaries, the creation of a dense network of branches and the existence of the cheque guarantee card ensuring the payee that any cheque made out for up to B.fr. 5,000 will be honoured have together done much to popularise the sight account.

There are today some 9,000 branches (including 1,845 post offices) in Belgium, while the number of sight accounts held is estimated at 588 per thousand inhabitants.

The move away from specialisation when the legal status of the private savings banks and that of the commercial banks were brought more closely into line with one another also played quite a considerable rôle in the growth of sight accounts. The authorities were themselves instrumental in the success of deposit money in exempting cheques from stamp duty (Law of 21st December 1962) and, above all, requiring tradesmen to hold a postal or bank account and granting the status of legal tender to all payments of B.fr. 10,000 and above between tradesmen through such accounts (Laws of 10th November 1967 and 1st April 1969).

The principal cashless payment media used in Belgium are the credit transfer (bank or postal), the cheque and the postal draft.

In 1978, for the entire financial system, 99 million credit transfers and 88 million cheques were exchanged in the clearing houses,

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88 million of the transfers and 72 million of the cheques being handled in Brussels and 11 million transfers and 16 million cheques in the provinces.

The postal draft is a payment instrument made out in the name of the payee, drawn on a postal current account and certified by the Postal Cheque Office for payment through a post office. Holders of a current account with a financial institution can cash a postal draft through their bank, which presents it to the Postal Cheque Office in a clearing house. The maximum value for a postal draft is fixed at B.fr. 750,000. In 1977 the Postal Cheque Office issued 57.9 million of these payment instruments.

In the same year the Postal Cheque Office handled 102.3 million inpayment transfers. This method of payment, which is largely used by individuals who do not have a current account, continues to play a very important rôle in Belgium. Cash can be paid in at the Postal Cheque Office or at any post office in Belgium for crediting to a postal account or bank account. There is no ceiling on the value of an inpayment transfer.

There are numerous other payment systems in Belgium such as credit cards, banker's drafts, receipt cards, etc. With the receipt card, holders of a postal current account can have cash paid out to them at home by the postman. These payment systems are of secondary importance.

### 2.2 Automated payments

To contend with the increase in costs associated, in particular, with the rapid growth in the use of deposit money, the financial institutions have developed automated procedures for processing corporate collections and payments. On the collection side, these procedures involve the systematic collection of domiciled invoices and the coded message transfer.

The systematic collection of domiciled invoices is a procedure based on an agreement between a company, its debtors and its financial institution. At the time of invoicing the company sends its financial institution the data relating to the claims to be collected, generally on a magnetic carrier. The financial institution collects from the debtors' institutions the amounts that are due and credits the company's account with the sum it has actually collected.

This procedure is extremely advantageous for the company and for the financial institution because it eliminates the handling of a large volume of paper (payment forms and accounting documents). It also means that the company can manage its customers' accounting records automatically and with the utmost reliability.

The coded message transfer is an ordinary credit transfer order bearing a standardised message (consisting of twelve digits the last two of which form a control number) from which the payee can identify the payer and the claim. When invoicing a debtor the company attaches a transfer/remittance form bearing a coded message in favour of its current account. At given intervals the company's financial institution sends it

a magnetic data carrier recording all the payments received, together with their reference codes.

On the outpayments side the financial institutions encourage companies to use magnetic carriers (magnetic tapes, floppy disks, cassettes) to deliver bulk payment orders in respect of staff salaries or for the payment of major suppliers, etc. Reliability is thereby enhanced and, in particular, no credit transfer forms have to be made out.

For companies that do not have a computer the financial institutions have introduced the quasi-standing order. Under this procedure the financial institution keeps a list of a company's creditors on its files. When a payment is to be made, the company sends its financial institution a standardised statement on which it needs to mention only the amounts and the payment messages.

Finally, holders of a personal account have been encouraged to give their financial institution a standing order for all their fixed, recurrent payments (e.g. rent).

The latest innovation in payment systems is the point-of-sale (POS) terminal. The first network of POS terminals was created in the second half of 1979. These machines, which it is intended should be installed in busy locations such as department stores, petrol stations and railway stations, enable payment to be made by means of a debit card, without cash, without a cheque. The advantage for the recipient, i.e. the tradesman, is evident: he is certain to be paid because the balance on the payer's account is verified and updated on the spot, the tradesman's account is credited immediately, and the handling of cash or cheques is eliminated. The existing network is still at an experimental stage but there seems to be no doubt that it will be developed in 1980.

### III. ORGANISATION OF PAYMENTS AND THE AUTOMATION OF PROCESSING

#### 1. The Belgian financial sector and the automated processing of operations

The Belgian financial sector comprises 127 institutions, conventionally divided into three categories: the commercial banks, the private savings banks and the public credit institutions. At the end of 1978 there were eighty-eight commercial banks with 3,609 offices, thirty-one private savings banks with approximately 2,000 offices and seven public credit institutions with just under 1,800 offices. The Postal Cheque Office is a special case; it is a semi-public institution for which the post offices, of which there are 1,845, act in practice as branches.

The relative importance of each of these categories can be seen from the following figures showing the number and total value of sight accounts held at the end of 1978:

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	<u>Number of sight accounts</u> (in millions)	<u>Value</u> (in billions of Belgian francs)
Commercial banks	3.1	291.2
Private savings banks	0.5	22.5
Public credit institutions	1.1	80.0
Postal Cheque Office	1.1	97.5

To enable them to handle the rapidly increasing number of transactions without being drowned in a sea of paper, all these institutions have been concerned to record the data at the beginning of the processing chain. At a very early stage they equipped themselves with computers to execute operations. After first installing one or more computers and the necessary peripheral equipment at their head offices the major institutions have to a large extent equipped their branches with terminals linked to a computer at head office or, in the case of the country's largest bank, at regional processing centres. There are thus several electronic funds transfer networks operated by individual financial institutions. Transactions are in some cases transmitted in batches and in some cases individually.

With more specific reference to the various types of teller terminals used, one public credit institution recently installed vocal response terminals in some of its branches. These terminals are connected to a telephone. After dialling the call number, the operator enters a secret code and, once that has been authenticated, the number of the account he wishes to interrogate. A pre-recorded voice replies rapidly, confirming the type of inquiry, spelling out the first six letters of the account-holder's name, noting any stopped cheques and giving the balance outstanding on the account.

Automation, together with the development of new payment procedures (invoice domiciling, the use of magnetic carriers to deliver payment orders, etc.), has enabled the financial institutions to come to grips effectively with the flood of paper and to avoid bottlenecks in their organisation.

In the international exchange of payment orders, too, the Belgian financial institutions have participated in the move towards automation. Seventeen institutions currently belong to the SWIFT network.

## 2. Clearing houses

The clearing houses, of which there are at present twenty-six, are associations with no legal personality of their own through which member financial institutions can pay mutual debts and collect mutual claims. These debts and claims mainly take the form of cheques, credit transfers, commercial bills, securities, coupons, foreign exchange contracts, debit advices and call-money transactions.

The clearing houses are located at the National Bank of Belgium in Brussels and in the provinces.



After the close of business in the provinces, which is earlier than in Brussels, the financial institutions, which are also members of the Brussels clearing house, transfer their debtor or creditor balance to their Brussels office. These balances are included among the transactions processed in Brussels. On the close of business in Brussels, the financial institutions with a debtor balance can take cover either by borrowing call money or by using their advances current account at the National Bank of Belgium; those with a creditor balance can lend in the call-money market.

As a result of the growing popularity of deposit money, the number of cheques and credit transfers exchanged in the clearing houses has increased considerably, with the number of items cleared rising from 38 million in 1969 to 197.6 million in 1978, which is equivalent to a growth of 420 per cent. The number of items cleared in the provinces has increased (from 13.9 million in 1969 to 28.3 million in 1978), but the share of the provincial clearing houses has declined steadily in proportion to the total number of items processed, falling from 36.6 per cent. in 1969 to 14.3 per cent. in 1978. This is largely due to the centralisation in Brussels of automated clearing members' operations.

### 3. The Clearing Centre for the Belgian Financial System

Realising that the conventional clearing system could grind to a halt, most of the country's financial institutions joined in creating, on 24th July 1974, a non-profit-making organisation called the Clearing Centre for the Belgian Financial System, commonly known by the abbreviation CEC, whose object is to organise the exchange of funds in Belgium with standardised data carriers that can be processed by computer.

The CEC is managed by a steering committee in which all the branches of the financial system are represented; the chairmanship of the committee is held automatically by the National Bank of Belgium.

Various working parties whose members are appointed by the steering committee have established precise standards and rules of procedure governing the CEC's activities.

For the performance of its daily operations, the CEC has concluded a service contract with the National Bank of Belgium, so that all the analysis, programming and secretarial work, as well as all the computer processing of the data delivered by members, is carried out by the central bank.

The CEC became operational on 9th December 1974, with cheque truncation. Less than a year later, on 13th October 1975, a second application, the truncation of credit transfers, was introduced.

The computerised processing carried out on behalf of the CEC consists principally of the verification of the data recorded on the input media, the sorting of the data according to the recipient financial institution and the production of the output media.

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The CEC operates on all working days. Transfers are processed in the morning and cheques in the afternoon. Input media have to be received at the CEC secretariat no later than 9.05 a.m. for transfers and 1 p.m. for cheques. The output media are available approximately two hours later. Operations recorded on input media that arrive late do not get cleared the same day.

The financial institutions would like a less rigid schedule for processing. Studies are in progress with a view to the processing of operations at any time.

At present magnetic tapes are the only type of input medium that is accepted. Output media include not only magnetic tapes but also paper vouchers (debit advices for cheques and credit advices for transfers). The CEC produces paper media only for those financial institutions which do not have a computer and which cannot therefore read magnetic tapes. It is planned that in February 1980 the CEC should also begin to input and output floppy disks.

The value of cheques exchanged through the CEC may not exceed B.fr. 50,000. There are three exceptions to this rule, namely:

- the value of eurocheques (cheques denominated in a foreign currency and cleared for their countervalue in Belgian francs) may not exceed B.fr. 10,000;
- there is no limit on the value of "cheques" resulting from transactions via an automated teller machine;
- there is no limit on the value of cheques received at point-of-sale terminals.

There is no ceiling on the value of credit transfers cleared through the CEC.

All except the small financial institutions are members of the CEC. In mid-1979 approximately forty financial institutions were submitting and receiving magnetic tapes. In addition, on the output side, debit advices were being sent to twenty-seven institutions and credit advices to eighty-three.

In 1978 the CEC processed 51,350,013 cheques, or an average of 206,225 a day, and 38,064,721 credit transfers, or an average of 152,870 a day. These figures represent 58 per cent. of all cheques and 38.4 per cent. of all transfers cleared in Belgium.

The success of the CEC has encouraged its members to study the development of new applications (for example, the processing of payments in respect of domiciled invoices) and the introduction of handling procedures even more suited to participants' needs (processing of operations at any time). The potential of the CEC is enormous.

4. Co-operation in the Belgian financial sector

Confronted with an ever-growing stream of paper, the Belgian financial institutions have sought to cope by automating the processing of operations as far as possible and by rationalising working methods.

Since January 1970, on the initiative of the National Bank of Belgium, working parties of administrative and data-processing experts from the various branches of the financial sector have met to find joint solutions to common problems.

From these wide-ranging consultations there have so far emerged nine protocols on co-operation in the field of payments. Under the first protocol, signed on 7th July 1970, each financial institution was given one or more three-digit identification numbers. The adoption of this code represented one stage in the process of standardising the format of account numbers, which was completed on 22nd April 1971 with the signing of the second protocol. The standardised format, which was eventually to facilitate the exchange of magnetic media between the financial institutions, was the following: first, the institution's identification number as defined by the first protocol, followed by a dash and the customer's account number, followed by a second dash and a two-digit control number equal to the remainder left over where the number formed by the first ten digits is divided by ninety-seven.

The third protocol, which was also signed on 22nd April 1971, determined the layout and use of the transfer and/or remittance document.

In practice, it took approximately two years before the old account numbers and credit transfer forms were phased out completely.

On 13th July 1972 the next three protocols were signed. The fourth protocol dealt with the inclusion of further information (principally the VAT number) of bills of exchange, promissory notes and warrants, though the layout of these documents, which had already been standardised, was not changed. The fifth protocol dealt with the systematic collection of invoices domiciled at financial institutions; in particular, it defined the format of the data carriers that could be sent to the financial institutions by corporate customers. This protocol is currently undergoing revision. The size and content of the various fields of the cheque were standardised by the sixth protocol.

The seventh protocol standardised the format of the magnetic tape used to transmit credit transfers between financial institutions.

A more ambitious objective was realised on 24th July 1974 with the signing of the eighth protocol formalising the decision to create a non-profit-making organisation called the Clearing Centre for the Belgian Financial System and laying down its statutes. Finally, a ninth protocol was signed in mid-1979. It lays down a standard for bankers' drafts.



2. C A N A D A



## I. INTRODUCTION

The purpose of this report is to present a detailed description of the Canadian payment system. At the same time, an appreciation of the structure of the financial system is central to such a description as well as to an understanding of the evolution of Canada's payment system. Accordingly, this report begins with a brief review of the institutional setting.

## II. THE INSTITUTIONAL SETTING

The financial needs of the household, commercial, industrial and governmental sectors of the Canadian economy are met by a number of different institutions - e.g. deposit-taking institutions, contractual savings institutions, investment dealers, sales finance companies, and so forth. In the context of the payment system, however, deposit-taking institutions are clearly the most important ones. This particular section of the report serves the following purposes: (i) to describe the various types of Canadian deposit-taking institution; (ii) to provide a broad survey of the accessibility and availability of the services of deposit-taking institutions; and (iii) in order to complete the description of the institutional setting, to outline the rôle and operations of the Bank of Canada.

### 1. Deposit-taking institutions

Canadian deposit-taking institutions include chartered banks, co-operative financial institutions, trust and mortgage loan companies, Quebec savings banks and governmental savings institutions. Each of these types of deposit-taking institution is described below. Moreover, the descriptive material contained in this sub-section is supplemented by the data on total assets in Appendix I.

#### (a) Chartered banks

The chartered banks are analogous to commercial banks in the United States and other countries. Although they were originally established to meet the needs of the commercial, industrial and governmental sectors of the economy, during the past fifteen years the chartered banks have also competed aggressively with other institutions in the market for personal financial services. There are currently eleven such institutions; the five largest ones operate extensively on a nationwide basis, while the remainder concentrate on serving the financial needs either of a particular region (e.g. the Province of Quebec) or of a particular sector of the economy.

The chartered banks accept various types of deposits from the public, including accounts payable on demand, personal savings deposits (both chequable and non-chequable) and fixed-term deposits. In addition

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to holding a portfolio of securities, they make loans under a wide variety of conditions for commercial, industrial, agricultural and consumer purposes. The chartered banks also deal in foreign exchange, receive and pay out bank-notes, provide safe-custody facilities and offer a wide range of other financial services. Since Canada has a branch banking system, these operations are, for the most part, carried out through an extensive network of bank branches. As at 31st December 1978 there were 7,405 bank offices in Canada, and 286 in more than forty foreign countries.

All banks that operate in Canada are chartered by Parliament under the Bank Act. This Federal Act regulates internal aspects of bank operations, such as the auditing of accounts, the issuing of stock, corporate powers and similar matters. In addition, the Act regulates the banks' relationships with the public, the Federal Government and the Bank of Canada - e.g. the reserves against the deposits that they are required to maintain at the Bank of Canada.

The Bank Act has been revised at approximately ten-year intervals; the most recent revision was enacted by Parliament early in 1967 and came into effect on 1st May of that year. In August 1976 the Federal Government published a White Paper dealing with the next revision of the Bank Act. Because the proposals are still being discussed and as a result of a recent Federal election, legislation to extend the present Act to 31st March 1980 was passed by the House of Commons in March 1979.

### (b) Co-operative financial institutions

Credit unions and "caisses populaires" (co-operative financial institutions serving principally French-speaking Canadians) were initially established by associational (religious or ethnic) or occupational groups to promote thrift by encouraging saving and to provide loans to members who could not get credit elsewhere or who could get it only at prohibitive interest rates. However, these institutions have for some time been expanding the range of services that they offer to their members and have also grown rapidly in importance in the savings and credit markets.

Although the credit union movement has a nationwide presence, individual credit unions are incorporated and supervised under provincial legislation. Almost all the local credit unions and "caisses populaires" belong to a credit union central operating within their respective province. There were 3,926 credit unions and "caisses populaires" in Canada at the end of 1977, with 4,665 offices. They reported, at the end of 1978, a membership of 9.1 million and assets of Can.\$ 23,976 million. Quebec, with 4.8 million members and assets of Can.\$ 11,150 million, accounted for 53 per cent. of the members and 46 per cent. of the assets of all credit unions and "caisses populaires" in Canada.

In 1978 there were seventeen credit union centrals, which are organised as centralised entities to serve the needs of their member local credit unions and "caisses populaires", mainly by accepting deposits of surplus resources from them and by providing a source of funds for them to borrow from when they cannot meet the demand for local loans. Ten provincial centrals are members of the Federally chartered Canadian



Co-operative Credit Society, which acts as their central organisation and provides them with other support services.

(c) Trust and mortgage loan companies

Trust companies perform financial intermediation as well as fiduciary functions. Under the financial intermediation function, trust companies can accept funds in exchange for their own credit 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 chartered banks. Trust companies also accept from their customers deposits which are transferable by order. Trust companies are the only corporations in Canada with the power to conduct fiduciary business. In this capacity they act, for example, as executors, trustees and administrators under wills or by appointment, as agents in the management of estates, and as agents and registrars for stock and bond issues.

Mortgage loan companies may also accept deposits and may issue both short-term and long-term debentures. Specific stipulations regarding the investment of these funds are contained in the relevant legislation, under which most of the funds are invested in mortgages secured by real estate.

There were approximately 100 trust and mortgage loan companies at the end of 1977 (although only a handful operate nationwide), with some 937 branches.

Trust and mortgage loan companies are registered with either the Federal or a provincial Government. They operate under the Federal Loan Companies Act or the Trust Companies Act, or under corresponding provincial legislation. Although there may be some differences between the Federal and provincial acts, the broad lines of the legislation are the same.

(d) Quebec savings banks and governmental savings institutions

The Montreal City and District Savings Bank (the only such institution in Canada) and the savings institutions operated by the provincial governments of Ontario and Alberta that offer deposit-taking services to individuals fall within this category. The branches of these institutions are relatively small in number (approximately 225 in total), and their operations are restricted to the Provinces of Quebec, Ontario and Alberta respectively.

The Federal Quebec Savings Bank Act governs the operations of the Montreal City and District Savings Bank. The Province of Ontario Savings Office and the Province of Alberta Treasury Branches are incorporated and operate under the terms of acts passed by their respective provincial legislatures.

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### 2. Accessibility and availability of personal financial services

Before the 1960s, proximity to business and commercial establishments was the principal determinant of the location of chartered bank branches. Since that time, the desire for national and regional representation as well as the promotion of personal financial services have become new incentives for adding banking outlets and for rationalising branch networks.

Expansion by the chartered banks into the market for personal financial services has been facilitated by their well-established and extensive branch networks. As is shown in Appendix II, the banks had 7,405 branches at the end of 1978, representing an increase of 19.5 per cent. over 1970. This rapid increase does to some extent, however, reflect the establishment of three chartered banks during this period.

In 1978 there was an average of one chartered-bank branch for every 3,194 Canadians, while at the beginning of the decade this number was 3,489. (As is shown in Appendix II, a downward trend is also witnessed for the total number of branches of all deposit-taking institutions.) Nevertheless, because of the large shift of population from rural areas to urban centres, the historical decline in this ratio does not necessarily indicate that branch facilities have become more accessible to the average person. In order to improve further upon the accessibility of their services, the banks have also innovated with respect to branch location, type of branch facility, the hours during which branches are open to the public, and the provision of more efficient customer service.

The move by the chartered banks into the market for personal financial services has provided competition to the credit unions and "caisses populaires", whose offices have traditionally been in close proximity to their members and open at the hours most convenient to them. In 1977 there were 3,926 local credit unions and "caisses populaires". This number is down by about 1,000 from 1965, which marked the historical peak. The reduction in the number of local co-operative financial institutions has been the result of the shift of population from rural areas to urban centres, as well as of the amalgamation of smaller and weaker institutions. Their average membership increased from 1,133 in 1970 to 2,119 in 1977. Nevertheless, the facilities of these institutions remain typically more accessible to many of their members than do those of the banks.

Because of the diversity among local credit unions and "caisses populaires", it is difficult to generalise with respect to the accessibility and availability of their outlets. Some local institutions have experimented with branches in order to maintain close contact with their members. In other instances where, because of changing life styles, the former bond of association no longer provides a sufficient number of members to justify a separate institution, a community institution or branch has been established; these are usually situated away from the member's place of employment or parish. As with banks, some branches are located in shopping centres.

In contrast to the chartered banks, credit unions and "caisses populaires", the trust and mortgage loan companies maintain relatively few branches, although their number has been growing rapidly. At the end of 1977 there were 937 trust company branches, of which 67 per cent. were located in Ontario and Quebec. It is not known exactly how many of these branches offer personal financial services. Some companies have opened new outlets specifically to attract household savings, some to expand their real-estate brokerage business, and others to provide a broad range of consumer services.

Trust companies have often been more innovative than other deposit-taking institutions with respect to the location and business hours of their branches. In 1968, for example, one trust company pioneered the use of in-house, on-line computer facilities to enable its customers to conduct their financial business at any one of its branches. In 1973 another trust company was the first deposit-taking institution to establish a branch within a department store.

### 3. The Bank of Canada

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

The rôle of the Bank of Canada in the payment system is rather limited. For example, it does not accept deposits from individuals or compete with the chartered banks in the commercial banking field. The Bank does, however, act as the Federal Government's fiscal agent and, through its agencies across the country and its head office, assists in the final settlement of balances for the bank-operated cheque clearing system. The Bank's operational rôle is not likely to expand significantly as a result of the introduction of electronic funds transfer. At the same time, the Bank will in the future be called upon to play a more important rôle than it does currently as a consequence of the proposed Canadian Payments Association. The Chairman of the Association's Board of Directors will be an officer of the Bank, and the establishment of the Association will result in a greater number of deposit-taking institutions being directly involved in the final settlement of balances at the Bank of Canada.

The head office of the Bank of Canada is in Ottawa. It has agencies in Halifax, Saint John, Montreal, Ottawa, Toronto, Winnipeg, Regina, Calgary and Vancouver.

Bank of Canada balance sheets for recent years are summarised in Appendix III.

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III. CASH PAYMENTS

1. Legal framework

(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, thereafter operating as a branch of the Department of Finance. The Mint was established as a Crown corporation in 1969 by the Government Reorganisation Act of that year to allow for a more industrial type of organisation and for greater flexibility in producing coins for Canada and for other countries. The Mint reports to Parliament through the Minister of Supply and Services.

(b) Currency

The modern history of currency in Canada might be considered to begin in the 19th century, when the growth of Upper and Lower Canada began to encourage the formation of domestic financial institutions. In the course of time, as banking became firmly established in Canada, banks began to make a substantial contribution to currency circulation through the issue of tokens and notes.

The Bank Act of 1871 laid the foundation for the co-ordinated issue of currency by banks, and this system continued until 1934. Concurrently with the issue of currency by banks, the Federal Government issued 25 cents, \$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 chartered 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 balance outstanding in their note circulation accounts as at 31st December 1949 and the Bank of Canada assumed the liability.

2. Distribution and handling

(a) Coins

The chartered banks are the source of all Canadian coins required for the circulation needs of the country. At all their branches, the banks attempt always to have an adequate supply of coins to meet the needs of the public. However, some branches may find that they are receiving large deposits of coins from merchants, and other branches may find that they are paying out coins, either in cashing cheques or through cash withdrawals by depositors. If, in these circumstances, a bank runs low on coins, its central offices replenish their supplies directly from the Royal Canadian Mint. The Bank of Canada monitors these requisitions

and offers the facility to effect prompt credit to the Receiver General Account upon the receipt of coins by the chartered bank.

The distribution system used by a bank is relatively simple. The central branch of the bank at each Bank of Canada agency point orders and obtains supplies for all the branches within its district from the Royal Canadian Mint. All the other branches of the bank obtain their supplies of coins from this central branch. Urban branches, however, generally obtain their coin supplies from the main branch in their city, which receives its coins from its central supply branch. Occasionally, branches of different banks within easy reach of each other may exchange surplus coins, if some have a surplus and others a deficit.

When surplus coins cannot be disposed of locally, branches may ship them to their supply branches. Reports on surplus coins are filed by local supply branches with central ones, which submit monthly reports to the local Bank of Canada agency. The agency makes this information available to all the banks in its area.

The Bank of Canada will neither buy back nor take back coins still fit for circulation. Accordingly, the Bank will assist in the exchange of coins among surplus and deficit banks, since this is more efficient than having the latter banks order more coins. Although the Bank will redeem coins no longer fit for circulation, the majority of chartered banks ship the unfit coins directly to the Mint. Once the value of the shipment has been determined by the Mint, it advises the Bank of Canada and settlement is effected by crediting the accounts which the chartered banks maintain at the Bank of Canada. Alternatively, branches at Bank of Canada agency points may, in keeping with the Bank's instructions, request settlement for redeemed coins in Bank of Canada notes or in new coins.

(b) Bank of Canada notes

The chartered banks are also the main distributors to the public of Bank of Canada notes. Notes surplus to the needs of the public will be redeposited with the banks. Unlike coins, however, surplus notes, even if fit for reissuing, may be returned by the banks to the Bank of Canada, either in exchange for other denominations or for immediate credit to their account. The principal reason for this difference between notes and coins is that notes are a liability of the Bank of Canada. The Bank, therefore, must redeem its liability and accept back reissuable notes which are not wanted by either the banks or the public.

The Bank of Canada also redeems unissuable notes - i.e. notes that are too soiled or worn or otherwise unfit for further circulation. Each bank branch, in handling notes, sorts out the unissuable notes, and parcels 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. The agency lists all the parcels received each day by 11 a.m. local time from all the branches of each bank and delivers copies of the list to the main branch of the bank at the agency point. The account of the bank with the Bank of Canada is credited that same day with the total of all the parcels of unissuable notes received at all agencies that day from all branches of the bank. Since notes wear out

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rapidly (the average life span of \$1 and \$2 notes has been estimated at under a year), there is a continual shipment of unissuable notes from bank branches to Bank of Canada agencies. The agencies, except those in Toronto and Montreal, forward the unissuable notes to Ottawa, where they are incinerated. The agencies in Toronto and Montreal have their own facilities for note destruction.

Notes still fit for circulation that are turned in to the Bank of Canada are held and reissued as the need arises. The Bank arranges for its own supply, buying the newly-printed notes from two privately-owned printing companies, at an agreed price, and issuing the notes in response to orders received from the chartered banks.

Notes, like coins, are ordered only by the designated supply branches of the banks. In ordering notes from the Bank of Canada, each central branch is authorised by its head office to draw on its own account with the Bank of Canada up to a certain daily total amount. The limit set will vary depending upon the location of the central branch. If the branch has to order currency in excess of its limit, with payment to come from the Bank of Canada account of its bank, the branch has to obtain permission from its head office, which then authorises the Bank of Canada to issue the additional amount. Each Bank of Canada agency holds a letter of authorisation from the head office of each bank authorising the agency to issue currency up to specified daily amounts to the designated supply branches and to debit the amount to the bank's account with the Bank of Canada.

### 3. Usage

Although a wide variety of payment media are available to Canadians, it would appear that notes and coins continue to be the most common and frequently used means of effecting everyday transactions. Unfortunately, there are no statistics or other information on either the number or the value of currency transactions. At the same time, it is not unreasonable to suppose that the usage of notes and coins in Canada is similar to that in many other countries - i.e. currency is used in between 80 and 90 per cent. of the total number of transactions and accounts for between 10 and 20 per cent. of the total value of transactions.

Data on currency in the hands of the public and per capita holdings of currency are presented in Appendix IV.

## IV. PAYMENT SYSTEM AUTOMATION: HISTORY AND RECENT TRENDS

The purpose of this section of the report is to review briefly the history of and recent trends in automation within the Canadian payment system in order to provide some background for the subsequent description of various payment mechanisms. The first or historical sub-section will

concentrate principally on the experience of the chartered banks, while the second one will cover the whole of the deposit-taking industry.

## 1. History

The operations of a deposit-taking institution involve, by their very nature, a great number of repetitive tasks. In 1977, for example, some 1.6 billion cheques were posted to over 30 million chartered-bank demand deposit and savings accounts across the country. Such routine and detailed work is ideally suited to computer processing. The computer can store the record of each account and, as individual payments and withdrawals are made, can also update the account in far less time and at much less cost than if records were maintained manually. Moreover, interest can be calculated in a fully automated fashion at the end of each month, quarter or half-year, and up-to-date listings that show account activity and status can be produced and sent to branches daily.

In response to a rapid rise in the growth of cheque-processing volumes and attendant cost pressures, the first aspect of the back-office operations of chartered banks to be automated during the early to mid-1960s was the demand deposits in the large branches. These accounts involved a high volume of transactions and the economic benefits arising from their computerisation were particularly significant. The further spread of computerised demand deposit accounts was aided by the development and introduction of the magnetic ink character recognition (MICR) cheque encoding standard. This standard, which was originally developed in the United States and later adapted for Canadian use by the Canadian Bankers' Association, enabled the banks to install high-speed cheque reader/sorters which could pick up the information encoded in the MICR band of each cheque, pass on this information automatically to the computer for account updating, and sort the cheques into appropriate bundles for onward delivery to the bank on which they were drawn.

During the same period several banks began to put their financial reporting systems onto computers to speed up the processing of the large volume of data sent regularly by branches to head office, and to increase the availability of management information.

These earliest computer applications used batch processing techniques - i.e. all the data for a given set of reports were gathered together and fed into the computer in a single unit for processing. Since the late 1960s, the banks have extended batch processing to a variety of other branch activities such as the maintenance of consumer lending portfolios, term deposits and commercial lending. (It is estimated that currently over 75 per cent. of all chartered-bank branches and some 90 per cent. of all chartered-bank accounts in Canada are served by batch systems.) Various head-office systems, such as capital stock, loan analysis and payroll services, were also automated at the same time.

Although batch systems use time-tested programming and operational techniques, they do have the disadvantage of being unable to provide information during the business day on an on-going basis as transactions arrive. This is a serious drawback in the servicing of retail customers,

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many of whom want to deposit or to withdraw amounts during the day and to receive an immediate update to their account status. In order to meet this particular need of their customers, some banks, in the late 1960s, began to introduce on-line savings accounts.

Other deposit-taking institutions were not slow, however, to recognise the economic, operational and other benefits of automation. At the present time the customers of a great number of Canadian deposit-taking institutions are familiar with the teller terminals and passbook printers which provide them with an immediate update of all their posted transactions and reflect the day's activity. Indeed, it is estimated that at the end of 1978 some 75 per cent. of chartered-bank branches and approximately 45 per cent. of the branches of all deposit-taking institutions provided on-line services to their customers.

### 2. Recent trends

The past five years have witnessed a marked increase in the pace of automation within the deposit-taking industry. This acceleration has generally been due to the following factors: (i) a sharp drop in the cost of the computer hardware required to perform a given set of operations; (ii) a growing range of hardware and software products, some of which have been specifically designed to meet the deposit-taking industry's needs; (iii) increasing sophistication and experience among systems and other personnel; (iv) steady growth in labour costs; and (v) a clearer perception of the long-run competitive advantages which can arise from automation. It is anticipated that, as a result of the continuation of these trends into the future, as well as the introduction of public, switched data networks by the country's communications common carriers and other technological advances, the pace of automation will continue to be rapid in the short term, and that the extent of automation within the industry will spread.

The computer systems that were implemented during the 1960s and the first lustrum of the present decade either made possible or resulted in only a few new services or features for the customer - e.g. credit cards, the so-called "package accounts", cash dispensers and automated teller machines. (It is estimated that there are some 250 cash dispensers and automated teller machines currently installed in Canada.) For the most part, computerisation did little more than automate portions of existing manual systems without changing their basic structure. The major impact of automation has been the removal of many back-office operations from branches to computer centres, a decline in the price which Canadians are charged for payment services, and containment of the operating costs of deposit-taking institutions. In the next decade, however, it is expected that deposit-taking institutions will devote more attention to the possibilities inherent in computerised systems for offering services to customers. The retail customer, for example, can expect to see improvements in services directed at providing him with easier and more rapid access to his funds.



V. THE PAPER-BASED CLEARING SYSTEM

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

1. Transferable deposits

Until 1957 the chartered banks offered individuals only one type of deposit account, the so-called "ordinary or regular savings account", on which they typically waived their 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 accounts in that no interest was paid on them, and encashed cheques were returned to the issuer along with a monthly or quarterly statement.

Competition by deposit-taking institutions for transferable deposits has intensified as they have, since the mid-1960s, become more oriented towards the household sector. Generally, these deposits are less volatile than others and, as such, provide a relatively stable pool of funds. For this reason, as well as to attract customers to their branches, deposit-taking institutions have introduced innovations designed either directly or indirectly to encourage an expansion of their chequable deposits. The introduction of personalised cheques, monthly instead of bi-monthly or quarterly statements, bank-by-mail plans, and the reintroduction of overdraft facilities are some of the methods which have been used to induce customers to open transferable deposit accounts. Furthermore, a number of institutions have introduced free chequing, which has become an important competitive tool for many smaller banks in the United States.

Data on Canadian transferable deposits are presented in Appendix IV.

2. Legal framework

The cheque collection and clearing system is currently operated by the chartered banks. The Canadian Bankers' Association Act provides that the Canadian Bankers' Association (the trade association of the chartered banks) "may from time to time establish in any place in Canada, a clearing house for banks, and make rules and regulations for the operations of such clearing houses..." The Act also provides that no rule or regulation may have any force or effect before it has been approved by the Federal Treasury Board.

The paper-based clearing system has two objectives: (i) to transmit negotiable instruments from the place and organisation where they are deposited to the place and institution on which they are drawn; and

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(ii) to facilitate the settlement of balances generated by the movement of amounts represented by these instruments. The clearing rules and arrangements that have been established by the Canadian Bankers' Association (CBA) and embodied in its by-laws govern how the various institutions which offer chequable deposits co-operate to achieve these objectives. The rules and clearing arrangements themselves have three essential functions; these functions are described below.

First, ensuring that the processing work and the associated costs of the clearing system are divided among the affected parties in a known and systematic way. The present clearing arrangements perform this function by requiring that each bank accept, and settle for on the following day, all items presented to it in accordance with the rules at the ten regional settlement points established by the CBA - i.e. the nine Bank of Canada agency points and Quebec City. A bank may choose either to accept items directly at any regional settlement point or to pay another bank to act on its behalf. For banks that are represented directly, it is assumed that the work which each does for the other balances out, and there are, therefore, no charges between direct clearing participants. Other deposit-taking institutions (which are frequently referred to as non-bank financial intermediaries or NBFIs) do not have direct access to the clearing system and must establish a correspondent arrangement with a bank, which processes its items and represents it in the clearings. The correspondent agreement typically sets out the fees to be paid to the bank, the minimum daily balance which the NBFI must maintain with the bank, and the time period(s) within which items drawn on the NBFI are to be deposited with the bank. Even though NBFIs do not have direct access to the clearing system, a payment instrument drawn on an NBFI can be readily negotiated for immediate credit at the branches of any deposit-taking institution.

Second, facilitating the efficient interaction of the various institutions. Currently, the systems that banks have established internally for handling cheques are highly automated and very complex. Accordingly, if these systems are to operate efficiently, there must be a high degree of co-operation among the various parties. The rules and agreements, therefore, set out the timing for various procedures to ensure the speedy clearing and posting of items, and also establish physical standards for cheques so that all items originating within the system can be handled by the equipment of each bank.

Third, ensuring that the float costs arising from the settlement process and the risks associated with invalid items or errors are shared in a known way among the affected parties. The dollar value of the items moving through the clearing system is sizable, and relatively minor deviations from the established timing can give rise to significant additional amounts of float. Moreover, a large number of high-value items move through the system, and there must be a means of determining what happens in the event of non-payment, error, and so forth.

3. Operations

The clearing process begins when a cheque, payment order, or other payment instrument (all of which are commonly called "items") is deposited at a chartered bank branch. The items are bundled and totalled, collected by courier and delivered to the bank's demand deposit accounting (DDA) centre. (The highly automated DDA centres that banks maintain across the country and the clearing houses established by the CBA are the backbone of the paper-based clearing system.) This work starts at midday on the day of deposit. The items are then checked, amount-encoded using magnetic ink character recognition (MICR) technology, and sorted into "on-us" items and items drawn on other banks, including NBFI items. At this stage, as many items as possible are microfilmed for tracing and security purposes. Items drawn on other banks are bundled together with control listings, picked up by couriers, and delivered to the DDA centres of those other banks. This exchange of items begins at around 6 p.m. each day (a small amount of work arrives at DDA centres all day long), rises to a peak late in the evening and, depending upon the distances to be covered by the incoming courier runs, slows down again around midnight.

A cut-off time is established at 11 p.m., but this may vary by clearing region and type of item. After this cut-off, items exchanged between banks are not included in the figures for the next day's settlement.

Items received by a DDA centre drawn on branches of the same bank in areas serviced by other centres are, wherever possible, also moved by air courier that evening. (Some indication of the volume of paper flown between data centres is given by the fact that as much as five tons of cheques, other instruments and inter-office correspondence are shipped daily by the large banks on a shared courier service across Canada.) However, some banks have developed or are developing systems whereby "on-us" items deposited in one region can have the information stripped from them and transmitted, via high-speed communications lines, to data centres serving the branches in other regions on which they are drawn, thus allowing the item to follow later without affecting the float time. After midnight, the DDA 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 shortly before 9.30 a.m. on the following day, when each bank provides its clearing clerk with figures relating to its own deliveries to and receipts from the other banks during the previous day for inclusion in the settlement. The clerks meet at the clearing house at the regional settlement point and arrive at the balances "due to" and "due from" each bank. This process is the actual clearing. When the balances are struck and agreed to, they are communicated to the nearest Bank of Canada agency. By 11 a.m. (Ottawa time) each bank is required to confirm with the agency the "due to" and "due from" balances. The agency then passes this information to the Bank of Canada's head office in Ottawa by the fastest means available. After the Bank has received this information, it adjusts the balances of the chartered banks in its own books, thus effecting the ultimate transfer of funds between banks. The final adjustment to each bank's account with the Bank is made

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at 3.30 p.m. (Ottawa time). Final settlement, therefore, takes place on the same day as the clearing sessions, but one day after the exchange of items among DDA centres.

### 4. Usage

Each weekday evening at fifty-one DDA centres, the chartered banks process between 4 million and 9 million cheques and other items, totalling between \$10 and 14 billion. In 1977 some 1.6 billion cheques were posted to over 30 million bank deposit and savings accounts across the country.

Over the course of a year, cheques for a total value in excess of \$2,000 billion, or ten times Canada's gross national expenditure, are handled by the chartered banks. Within that total, wage and salary payments account for less than 9 per cent. The large scale of these payment flows is due mainly to the nature of the productive system, in which there are chains of transfers from company to company as raw materials are transformed into finished products. Naturally, the total of the payments made at each stage in the chain will greatly exceed the final price to the consumer.

There are two specialised markets which add significantly to the magnitude of the payment flows. First, there is the foreign exchange market. On a heavy trading day, the payment of contracts for the purchase or sale of Canadian currency can account for as much as 6 or 7 per cent. of the total dollar value of items passing through the clearing system. The second is the money market, in which the buying and selling of short-term government and corporate securities is carried out. Trading in the money market may, on any given day, be responsible for 10 per cent. or more of the total value of cheques processed by the banks.

The number of cheques issued as a result of large transactions in the financial markets and large corporate purchases is relatively small. Only 0.4 per cent. of an average day's volume of 4.4 million items exchanged between chartered banks have a value in excess of \$50,000. Those that do are, however, quite large, with an average value amounting to over \$375,000, and they account for \$6.4 billion or 74 per cent. of the total value of cheques cleared on a typical day. These figures stand in stark contrast to similar data for items under \$50,000. These items, which represent a mix of both personal and commercial transactions, have an average value of \$530, but account for over 90 per cent. of the number of items that pass through the clearings.

The clearing system also handles a wide range of items that are not drawn on accounts maintained with chartered banks. Federal Government payments such as family allowances, welfare and unemployment benefits, and interest payments on government debt, which are settled through the Bank of Canada, account for up to 10 per cent. of all the items handled by the system. Items drawn on NBFIs represent approximately 5 per cent. of the items that pass through the system and some 2 per cent. of the value exchanged. Moreover, the clearing system handles a range of specialised instruments such as postal money orders, grain payment tickets,

travellers' cheques and Loto Canada tickets. In addition to these non-bank items, the clearing system handles the exchange of bankers' drafts, which are instruments issued by banks and drawn on themselves. Finally, about 20 per cent. of the items deposited with banks are drawn on their own customers' accounts and can, therefore, be processed internally without going through the interbank clearing system. The total value of all these items amounts to around 33 per cent. of all the items processed by banks.

## VI. CREDIT CARDS

It has been estimated that in 1978 there were between 37 million and 42 million credit cards outstanding in Canada, and about 35 different card issuers. The two bank credit cards - Chargex/Visa and Master Charge - are among the most popular and also have a significant presence in the market. Accordingly, the first, second and fourth sub-sections that follow will deal exclusively with bank credit cards, while the third one will present information on all types of credit cards.

### 1. Legal framework

The legal framework for bank credit cards comprises specific statutory provisions enacted by a number of provincial legislatures, a written agreement between the card-holder and the card-issuing bank, a written agreement between the merchant and his bank, and the operating rules and by-laws of each bank credit card plan.

### 2. Operations

The Chargex/Visa and Master Charge plans operate in essentially the same way. Upon application to a participating bank, a card is issued to any creditworthy individual. Each bank establishes its own standards of creditworthiness as well as the amount of credit which it is prepared to extend to individual card-holders. Although the line of credit of an individual card-holder is subject to negotiation between himself and his bank, the banks generally follow set guidelines with respect to the minimum and maximum lines of credit which they extend. The minimum line of credit is \$300 under Chargex/Visa and \$400 under Master Charge. The maximum is set at \$2,500 under both plans, with negotiated higher limits for exceptional cases.

The bank credit card plans permit the card-holder to obtain cash advances at the branches of all banks belonging to a particular plan and to charge purchases at all participating outlets. Card-holders are billed once a month. They have the option of paying the whole amount at one time or by monthly instalments. It has been estimated that 35 per cent. of card-holders pay their bills in full each month, while the remainder make monthly payments. If the whole amount is paid within the grace period of twenty-five days no interest charge is made, except for cash advances.

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Interest on cash advances is charged from the moment the advance is posted to the customer's credit card account. Banks charge 1.75 per cent. per month on both outstanding balances and cash advances.

Before Master Charge was started in Canada in 1973, merchants and others who had joined Chargex/Visa paid an initial sign-up charge of \$25 plus imprinter rental of \$12 a month. Master Charge banks did not charge a sign-up fee, and both plans subsequently made an agreement whereby the imprinter provided by either plan could be used to imprint sales vouchers for both plans.

When an individual makes a purchase and wants to make payments by using his bank credit card, the procedure is as follows. The card is presented to the participating merchant, who checks its validity against a "hot card" list to make sure that it is not a lost or stolen card which is being used by an unauthorised person. These lists are sent regularly to all participating merchants. Each merchant is given a so-called "floor limit", typically \$75, on individual card purchases. If a purchase exceeds the specific floor limit, the merchant is required to call for credit authorisation. Under the Chargex/Visa system, an authorisation centre of the bank that issued the card is called. Under the Master Charge system, the merchant calls the bank with which he is associated. At the authorisation centre, an on-line check is made to ensure that the amount of the purchase is within the credit limit assigned to the card-holder or that the transactions and payments record of the card-holder warrants an exception to exceed the assigned limit. If the authorisation is granted or if it is not needed, the merchant uses the card to imprint a standardised voucher, enters the amount of the purchase and other details on it, and requests the card-holder to verify the sale with his signature, which should match that on his card. The card-holder retains a copy of the voucher for his records.

The merchant deposits his vouchers with his own bank in the same way as he would an ordinary cheque or payment order, which he must do within three days of the date of a payment transaction, and his account is credited accordingly. In effect, the bank assumes the merchant's accounts receivable. For this service, the merchant pays a discount on the gross amount of the sales vouchers deposited with the bank. This discount ranges between 2 and 5.75 per cent. and diminishes on a sliding scale as the volume or the average value of transactions, or both, rise.

At the end of each day the bank branch sends all the sales vouchers that have been deposited with it to the nearest credit card processing centre of its bank via a courier. (Each card-issuing bank typically maintains three such centres across the country.) At the centre, the vouchers are sorted into "on-us" items and items for other banks. The "on-us" items are immediately posted to the customer's credit card account. By mutual agreement, the vouchers are truncated at this point. (Truncation is aided by the use of descriptive rather than country-club billing.\*1) Magnetic tapes are prepared with data from the vouchers for other banks. These tapes are exchanged daily among banks and are accompanied by a settlement voucher, which is presented at the clearings the following morning.

3. Usage

It would appear that Canadians rely heavily upon "plastic money" - i.e. bank credit cards, proprietary retail cards, and travel and entertainment cards. The results of a recent survey indicate that: (i) 61 per cent. of Canadians possess at least one credit card; (ii) the typical card user possesses 2.8 cards; and (iii) 45 per cent. have three or more cards. Furthermore, credit cards are deemed to be useful by 83 per cent. of those who hold them and by 56 per cent. of all Canadians. However, 36 per cent. of all Canadians consider them to be useless and unnecessary, and this figure includes many who have cards. Those Canadians who are card-holders use their cards, on average, five times per month.

4. Recent developments

There are three broad developments in the bank credit card area which should be noted at this point. These developments are: (i) the increasing acceptance of bank credit cards by larger, full-line Canadian department stores, although these stores do continue to issue their own proprietary cards as well; (ii) the greater interest that is being shown by other banks and NBFIs in becoming card issuers; and (iii) the growing number of card-based services, in which the card serves as either an identification or access device.

VII. PRE-AUTHORISED DEBIT PAYMENTS

Pre-authorized debit payments are not widely used in Canada at the present time and are restricted mainly to recurring, fixed-amount payments such as insurance premiums, mortgage payments, utility bills and rent.

1. Legal framework

Since a debit voucher is neither a bill of exchange nor a promissory note within the meaning of the Federal Bills of Exchange Act, this Act does not apply to the pre-authorized debit payment plan. Accordingly, the legal framework for pre-authorized debit payments emanates from a series of relationships and rules which have been developed by the private sector.

The legal framework for pre-authorized debit payments comprises the Inter-Bank Agreement of 20th August 1973, the authorisation given by a debtor (account-holder) to a creditor, the undertaking given by a creditor to his bank that a written authorisation has been received from the debtor, and the letter of undertaking between a creditor and his bank.

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### 2. Operations

At the present time, only paper vouchers are exchanged among the banks under the pre-authorised debit payment plan, the operation of which is presented in the following points:

- (i) A creditor obtains from a debtor that person's written authorisation to initiate debit entries from a specific account with a deposit-taking institution. The debtor will frequently send to the creditor a blank cheque marked "void". In this way, the creditor obtains the MICR-encoded information giving the branch and account number of the debtor.
- (ii) The creditor, prior to the payment date, prepares a debit voucher for each account or a magnetic tape with the information on all the accounts to be debited. The debtor, it should be noted, does not sign the voucher.
- (iii) The creditor presents the payment information to his bank prior to the payment date.
- (iv) The creditor's bank credits its customer for the total amount of the vouchers and forwards them, through the paper-based clearing system, to the appropriate drawee banks as if these vouchers were cheques.
- (v) The drawee bank or NBFBI will debit the debtor's account. The drawee bank will also return a voucher to the collecting bank when, for example, there are insufficient funds to honour it.
- (vi) The banks settle with each other by exchanging settlement vouchers and by adjusting, in the normal manner, the accounts each one maintains at the Bank of Canada.

### VIII. PRE-AUTHORISED CREDIT PAYMENTS

Pre-authorised credit payments are also not widely used in Canada at the present time and are mainly restricted to recurring, fixed-amount payments such as salaries, annuities and certain governmental payments.

#### 1. Legal framework

When either a magnetic tape or a computer print-out listing the credits is used to transfer funds, the Federal Bills of Exchange Act does not apply because the instrument of payment is neither a bill of exchange nor a cheque. Thus, as in the case of direct debits, the legal framework for direct credits comprises a series of rules and relationships which have been developed by the private sector. However, in contrast to the



legal framework for the pre-authorized debit payment plan, bankers have not signed an interbank agreement for the Inter-Bank Credit Clearing System. This development is not unique to Canada and is common in other countries.

The legal framework for direct credits is composed of the Standards and Procedures for the Exchange of Financial Data developed by the CBA, the authorisation given by the payee to the payer, and the agreement or letter of undertaking between a payer and his deposit-taking institution.

## 2. Operations

The direct credit method of payment may be realised either by clearing paper vouchers or by exchanging magnetic tapes. What is particular about a direct credit is that it operates as part of a remittance process and is characterised by a credit flow of funds. The payer's deposit-taking institution first debits the payer's account and then either credits the payee's account or (when another deposit-taking institution is involved) transfers the appropriate payment information together with a settlement voucher to the payee's deposit-taking institution. In contrast, a cheque or a pre-authorized debit payment function as part of a collection process and are characterised by a debit flow of funds - i.e. the depositor's institution first credits that person's account and then either debits the drawer's account or transfers the instrument to the drawee deposit-taking institution for collection.

### (a) Direct credits using paper instruments

The operations of the system for paper-based direct credits are summarised in the following points:

- (i) A payer obtains from a payee that person's written authorisation to directly credit a specified account with the deposit-taking institution selected by the payee. The payee may send a blank cheque marked "void" to the payer. In this way, the payer obtains the MICR-encoded transit number of the payee's deposit-taking institution and branch as well as the payee's account number.
- (ii) The payer, prior to the payment date, presents to its bank the necessary payment information and a cheque for the total amount of money to be transferred.
- (iii) The payer's bank processes this information.
- (iv) The payer's bank debits the payer's account and credits the accounts that payees maintain with any of its branches.
- (v) The payer's bank sends the processed information to each payee's deposit-taking institution along with a cheque or settlement voucher for the total amount of money to be

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credited to accounts maintained by payees at that institution's branches.

- (vi) The payee's deposit-taking institution credits the payee's account.
- (vii) The banks will settle with each other by exchanging settlement vouchers. The settlement among banks takes place in the normal manner by adjusting the balances in the accounts which each maintains at the Bank of Canada.

### (b) Direct credits using magnetic tape

Since August 1976 some chartered banks have been exchanging magnetic tapes in Montreal, Toronto and Vancouver under the credit transfer system developed jointly by the banks through the CBA. This service became fully operational in 1977. Monthly volumes being passed through the interbank exchange are still relatively small, amounting to some 100,000 items per month in mid-1978. When the system is completely implemented, magnetic tapes will be exchanged at all ten regional settlement points.

The operations of the Inter-Bank Credit Clearing System are presented in the following points:

- (i) A payer obtains a written authorisation from a payee.
- (ii) The payer or his bank prepares a magnetic tape which includes the relevant payment information - e.g. the amount of the payment, the payee's account number, and the payee's deposit-taking institution.
- (iii) The payer presents the magnetic tape or payment information to his bank several days before the due date for sorting and processing.
- (iv) The payer's bank debits the payer's account for the total amount of the money to be transferred.
- (v) If the payer has provided the magnetic tape, his bank balances the entries on the tape with a computer print-out that summarises the information on the tape. It then processes the tape and extracts those entries pertaining to accounts that payees maintain with its own branches. In some cases, these accounts may be posted prior to the payment date and credited as at that date. A statement of account, reflecting the credit, will then be sent to each payee.
- (vi) The payer's bank sorts the other entries on the tape and produces a separate tape for each bank with which a payee maintains an account or for each bank which acts as an agent for an NBFII with which a payee maintains an account. Alternatively, the payer's bank may produce a print-out

listing the accounts that each payee's deposit-taking institution is to credit.

- (vii) The payee's deposit-taking institution balances the credit entries on the tape with a computer print-out summarising the information on the tape. Each payee's account may be posted prior to the payment date and credited as at that date. A statement of account reflecting the credit will be sent to the payee.
- (viii) Settlement is effected in the same manner as in the case of paper-based direct credits.

#### IX. INTERNATIONAL PAYMENTS

The processing and clearing of international payments is handled in two different ways. The Inter-Bank International Payments System (IIPS) is used by the chartered banks and the Bank of Canada to execute foreign exchange transactions among themselves and international transfers of funds on behalf of their clients and correspondents. In order to execute transfers speedily, the banks use a service bureau operated by a communications common carrier to forward payment instructions among themselves in Canada and from their foreign operations. IIPS operates in a manner similar to that of CHIPS in New York, but it does not maintain clearing balances for settlement purposes. SWIFT, of which the Bank of Canada is not a member, is used for most other international payments and operates independently of IIPS.

#### X. THE CANADIAN PAYMENTS ASSOCIATION

It is possible, on the basis of the information presented in this report, to identify two trends within the Canadian payment system. These trends are, first, that NBFIs are becoming both increasingly sophisticated in their operations and important to the provision of financial services to the household sector (particularly the acceptance of orders for the transfer of deposits) and, second, that the Canadian payment system is evolving from a system based almost exclusively upon cash and paper transactions towards an electronic one in which paper transactions will eventually assume a less prominent rôle.

A White Paper that was issued in 1976 by the Federal Government as a prelude to the decennial revision of the Bank Act, which was entitled "Canadian banking legislation", drew public attention to these trends. The White Paper, however, also expressed concern about inequalities which had arisen in the operation of the Canadian clearing system. Specifically, it noted that NBFIs, which operate under legislation different from that of the chartered banks, did not have a voice in either the planning or the operation of the system. The White Paper concluded,

## Canada

therefore, that the economic interests of Canada would be best served by a national clearing system in which all the institutions directly involved could participate and share the requisite rights and obligations in an equitable manner. To give effect to this conclusion, it proposed that a Canadian Payments Association be established by companion legislation to the Bank Act. The objectives of the Association, as stipulated in the Canadian Payments Association Act, are "to establish a national clearings and settlements system and to plan the evolution of the Canadian payments system". The proposed Act, therefore, repeals the power given to the Canadian Bankers' Association to establish and operate clearing houses.

The Federal Government had already recognised, prior to the publication of the White Paper, that for reasons of efficiency and equitable competition NBFIs should participate in the work that must precede the introduction of an electronic payment system. Accordingly, they were represented on the Canadian Payments System Standards Group, or CPSSG. The CPSSG, a committee of deposit-taking institutions, communications common carriers and computer manufacturers which was called into being by the Federal Government in 1975, was charged with the responsibility for developing the necessary standards and performance criteria to facilitate the use of the common-user communications network for the payment system which had been advocated by the Government in its policy statement "Towards an electronic payments system". The Group submitted its final report to the Federal Ministers of Finance and Communications in July 1978.

Although membership in the Canadian Payments Association will be mandatory for chartered banks, all other institutions in Canada that offer transferable deposits and meet the requirements of the Canadian Payments Association Act will be allowed to join the Association on a voluntary basis. While the Association will operate within the framework of its Act, its management and operation will be the responsibility of a board of directors which will be chaired by an officer of the Bank of Canada and whose members will, after the start-up period, be elected by the members of the Association. At the same time, the Federal Government will have a supervisory rôle through its powers to approve by-laws and the activities of the Inspector General of Banks. Moreover, the Chairman will play an important rôle, since he will be expected to bring a public-interest perspective to the work of the Board of Directors.

## Footnote

- \*1) Country-club billing is a billing system in which the account statement is accompanied by copies of original invoices.

## APPENDIX I

Total assets of Canadian deposit-taking institutions, 1970-78(in millions of Canadian dollars, as at end of period<sup>1</sup>)

	1970	1971	1972	1973	1974	1975	1976	1977	1978
Chartered banks <sup>2</sup> .....	47,307	54,428	63,222	79,754	97,015	108,378	126,403	150,477	189,100
Local credit unions and "caisses populaires" .....	4,570	5,532	7,040	8,814	10,315	12,791	15,692	19,618	23,976
Trust and mortgage loan companies	10,343	11,629	13,381	16,446	19,185	22,621	27,560	32,477	38,192
Quebec savings banks .....	568	637	709	805	884	970	1,118	1,270	1,451
Governmental savings institutions (Alberta Treasury Branches only)	234	262	304	355	519	659	849	1,090	1,265

1. 31st December, except in the case of governmental savings institutions, where the end of period is 31st March.
2. Between 1970 and 1978 the foreign currency assets of the chartered banks increased from 28.9 per cent. to 35.4 per cent. of their total assets.

Canada

APPENDIX II

Domestic branches of Canadian deposit-taking institutions, 1970-78\*

	1970	1971	1972	1973	1974	1975	1976	1977	1978
Chartered banks .....	6,199	6,352	6,504	6,701	6,878	7,035	7,189	7,324	7,405
Local credit unions and "caisses populaires" .....	4,595	4,444	4,351	4,256	4,656	4,661	4,670	4,665	n.a.
Trust and mortgage loan companies	496	550	532	593	698	714	847	937	n.a.
Quebec savings banks .....	78	81	83	87	89	100	103	106	n.a.
Governmental savings institutions	94	94	95	106	107	111	112	119	n.a.
Total .....	11,462	11,521	11,565	11,743	12,428	12,621	12,921	13,151	-
Population per branch .....	1,873	1,884	1,897	1,893	1,816	1,813	1,792	1,779	-

\* As at end of period, i.e. 31st December, except in the case of governmental savings institutions, where the end of period is 31st March.

## APPENDIX III

Bank of Canada assets and liabilities, 1970-78<sup>1</sup>  
(in millions of Canadian dollars, as at 31st December)

	1970	1971	1972	1973	1974	1975	1976	1977	1978
<b>Assets</b>									
Government of Canada securities	4,241.3	4,815.5	5,406.9	5,975.8	6,978.6	7,808.5	8,385.5	10,225.1	11,923.7
Bankers' acceptances .....	-	1.0	-	39.2	139.7	44.1	104.8	13.7	21.6
Advances to chartered and savings banks .....	-	2.0	1.9	-	8.0	-	23.0	40.5	-
Foreign currency assets .....	194.5	257.6	468.0	808.5	578.1	1,093.3	1,431.1	1,261.1	1,267.4
Investment in Industrial Development Bank .....	469.6	513.9	586.1	720.8	965.0	1,029.5	858.4	686.9	515.7
All other assets .....	499.6	428.7	593.4	455.0	514.7	520.5	1,040.5	1,189.0	1,377.3
<b>Total assets .....</b>	<b>5,405.0</b>	<b>6,018.8</b>	<b>7,056.3</b>	<b>7,999.2</b>	<b>9,184.1</b>	<b>10,495.9</b>	<b>11,843.2</b>	<b>13,416.4</b>	<b>15,105.6</b>
<b>Liabilities</b>									
Notes in circulation .....	3,632.3	4,103.4	4,806.2	5,551.2	6,290.5	7,283.1	7,813.1	8,638.6	9,539.7
Canadian dollar deposits:									
Government of Canada .....	228.0	68.4	26.7	6.4	16.7	26.6	32.5	26.0	29.2
Chartered banks .....	1,176.4	1,472.8	1,697.9	2,006.5	2,361.3	2,748.5	3,169.3	3,704.5	4,291.8
Other .....	37.9	44.0	52.3	54.2	101.3	63.3	123.5	130.9	92.5
Foreign currency liabilities ..	32.6	39.1	58.0	25.2	1.9	7.7	56.0	99.9	121.7
All other liabilities .....	297.8	291.2	415.3	355.8	412.5	366.7	648.8	816.5	1,030.7
<b>Total liabilities .....</b>	<b>5,405.0</b>	<b>6,018.8</b>	<b>7,056.3</b>	<b>7,999.2</b>	<b>9,184.1</b>	<b>10,495.9</b>	<b>11,843.2</b>	<b>13,416.4</b>	<b>15,105.6</b>

1. Owing to the rounding of figures, components may not always add to the totals shown.

# Canada

## APPENDIX IV<sup>1</sup>

### Currency outside banks, 1970-78

(in millions of Canadian dollars, as at 31st December)

	1970	1971	1972	1973	1974	1975	1976	1977	1978
Notes .....	3,106	3,506	4,056	4,620	5,213	6,079	6,573	7,268	8,075
Coins .....	461	488	518	589	656	708	760	826	890
Total .....	3,568	3,993	4,574	5,209	5,868	6,787	7,333	8,094	8,964
Currency per capita (dollars) .....	166	184	208	234	260	296	316	346	380

### Transferable deposits, 1970-78

(in millions of Canadian dollars, as at end of period<sup>2</sup>)

	1970	1971	1972	1973	1974	1975	1976	1977	1978
Chartered banks <sup>3</sup> :									
Demand deposits (less private-sector float)	6,316	7,611	8,616	9,387	9,587	12,166	12,031	13,539	14,596
(Currency outside banks and demand deposits-M <sub>1</sub> )	(9,799)	(11,500)	(13,054)	(14,527)	(15,378)	(18,914)	(19,272)	(21,509)	(23,352)
Chequable savings deposits .....	5,596	6,069	6,642	6,967	6,457	7,111	7,078	7,565	7,658
Local credit unions and "caisses populaires":									
Demand and chequable savings deposits .....	n.a.	n.a.	n.a.	n.a.	n.a.	2,859	3,111	3,597	4,011
Trust and mortgage loan companies:									
Demand and chequable savings deposits .....	554	614	708	737	658	794	812	944	1,044
Quebec savings banks:									
Demand and chequable savings deposits .....	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Governmental savings institutions:									
Demand and chequable savings deposits .....	166	178	237	259	300	367	464	551	539
Total .....	-	-	-	-	-	23,297	23,496	26,196	27,848
Transferable deposits per capita (dollars) ....						1,018	1,014	1,120	1,180
Transferable deposits and currency per capita (dollars) .....	-	-	-	-	-	1,314	1,330	1,466	1,560

1. Owing to the rounding of figures, components may not always add to the totals shown.

2. 31st December, except in the case of governmental savings institutions, where the end of period is 31st March.

3. Average of Wednesday data.



3. F R A N C E



I. INTRODUCTION

The face of payment mechanisms has been transformed in the course of recent years. Technological progress has obviously brought great changes in methods of processing and transmitting cashless payments. However, it is above all the rapid evolution of user attitudes that has firmly established the predominance of deposit money over currency in all other than small transactions.

Bank-notes and coin, which represented only 11.8 per cent. of all monetary and quasi-monetary assets in 1978, compared with 37.9 per cent. in 1960, have become a secondary form of liquidity-holding. More than 90 per cent. of households today possess a sight account. In ten years the number of bank cheques has multiplied fivefold and that of postal cheques twofold.

II. BANK-NOTES AND COIN1. Issue of currency

Responsibility for the minting of coins lies with the Treasury.

The sole right to issue bank-notes is vested in the Bank of France, which:

- itself carries out the printing;
- puts the notes, and the coin supplied to it by the Treasury, into circulation via its 234 branches;
- ensures that the requirements of the public are met both quantitatively and qualitatively (sorting of incoming notes, adequate supply of new notes).

In practice, the commercial banks and the Postal Administration collect from the counters of the central bank the currency they need to cover customers' cash withdrawals and return surplus receipts.

At the end of 1978 the amount of currency in circulation totalled Fr.fr. 136 billion, made up as follows:

	Number (in millions)	Amount (in billions of francs)
Bank-notes	1,333	130
Coins	6,796	6

## France

### 2. Spheres in which cash is used

Industrial and commercial firms have virtually ceased to pay their suppliers in cash. It may therefore be presumed that currency plays only a minor rôle at the intermediate stages of production and sale, and that the bulk of cash movements involve individuals, i.e. the payment of wages and salaries, social security payments, final personal consumption. However, in these spheres, too, bank-notes and coin have lost and are continuing to lose ground:

- less than 30 per cent. of wage-earners now receive their remuneration in cash;
- although almost 40 per cent. of family allowances and some 60 per cent. of sickness insurance benefits and old-age pensions were in 1975 still paid to the recipients in cash\*1), either directly or via the Postal Administration, the authorities are endeavouring to promote methods of cashless payment;
- already well under half of the total value of personal expenditure involves currency.

Despite this decline, and although it is difficult to put an accurate figure on the amount and number of transactions effected in the two types of money, cash undeniably remains the most convenient medium - irreplaceable for the present and for a long time hence - that is available to individuals for settling small items of current expenditure.

### 3. Automated handling of currency

#### Withdrawals

Almost 1,600 automated cash dispensers, at present mostly off-line, are currently in use. More and more are being installed but the number of card-holders is still limited - 3 million at the end of 1978 - and automatic withdrawal is still seen by customers as an emergency solution.

- Automated points of sale, activated by coins, have become widespread in specific sectors: issue of railway tickets, motorway tolls.

#### Internal handling

Mechanical means have long been used to handle coins, at least to count them and to pack them into rolls.

In the case of bank-notes, mechanical counting is becoming increasingly common, in particular at the Bank of France, but fully automated sorting to remove unfit notes from circulation is still at the stage of research and experimentation with prototypes; before any real progress can be made in this respect, an answer will have to be found to the problem of counterfeit detection.

On the whole, currency fulfils the rôle of a public service satisfactorily, despite the comparative escalation of forgeries in the past three years.

It is generally accepted that cash constitutes not only the most practical but, from the point of view of the community at large, also the cheapest medium for small hand-to-hand payments; however, while a threshold undoubtedly exists above which it would be in the greater common interest for a payment to be made in deposit money, and vice versa, the question has so far never been given serious thought.

### III. CASHLESS PAYMENTS

The operations of the financial institutions and the transactions of their customers will be looked at separately.

#### 1. Operations of the financial institutions

The bulk of interbank fund transfers are effected in one of two ways:

- via the Paris bankers' Clearing Office, where "avals de trésorerie" relating to interbank lending against securities are exchanged,

- via the current accounts opened in the books of the head office or branches of the Bank of France, in which are recorded local transactions by "pink" transfer, banks' refinancing operations at the central bank, clearing balances, out-of-town telegraphic credit transfers by order of an institution for its own account, etc.

The dense concentration of banks' head offices in the capital is reflected in the centralisation in Paris of interbank fund movements.

The sums involved are considerable: Fr.fr. 18,053 billion for "avals de trésorerie" and Fr.fr. 8,992 billion for "pink" transfers in 1977; the total number of transactions was, however, only 2.7 million.

The local credit transfer system may seem archaic - the initiator prepares a paper voucher which is taken post haste by a messenger and lodged at the counters of the Bank of France - and in fact quite recently plans were considered for a clearing network; the envisaged network would have covered the capital and its outskirts, with telecommunications facilities providing for the rapid transmission and recording of transactions of this type. This project was mothballed for several reasons: not all of the parties concerned were convinced of its immediate necessity; part of the banking profession was unenthusiastic about a step which might have heralded the creation of a network covering the whole of France; the Postal Administration proposed not only to lease the lines but also to handle the message switching.

## France

The start-up of SWIFT has breathed fresh life into the project, although in modified, partial form. There are, in fact, plans to automate payments in francs following from international transfers of funds (project SAGITTAIRE), which according to a survey based on 1974 statistics then represented more than 40 per cent. of the total number of transactions which would potentially be handled by a clearing network. Unlike SWIFT messages, these franc payments represent purely domestic movements and will therefore have to be channelled via the Bank Message Switching Centre (Centre de Commutation des Messages Bancaires - CCMB) which is being set up by the Postal Administration.

### 2. Operations of the Treasury, non-financial businesses and individuals

#### (a) Factors in the growth of cashless payments

Note may be taken of:

- the legal obligation on "tradesmen" to settle by means of a crossed cheque or a credit transfer to a bank account or postal cheque account all payments to other "tradesmen" in excess of Fr.fr. 1,000, the term "tradesmen" applying not only to wholesalers and retailers but also to industrial and small-scale businesses;

- the legal obligation to use the same methods of payment for salaries and wages in excess of Fr.fr. 2,500, with a threshold of only Fr.fr. 1,500 as recently as the beginning of 1977;

- the increasing tendency since 1969 for earnings to be paid monthly rather than weekly;

- the abolition in 1967 of all restrictions on the opening of branches with a view to promoting "the development of livelier interbank competition";

- the intensive publicity campaigns run by the credit institutions in order to familiarise the public with the bank account and the use of cheques;

- the spread of the banking habit to virtually all households;

- the fact that most payment services, in particular the postal giro transfer and the bank cheque, are free of charge, this being said to be the counterpart to the non-payment of interest on sight deposits;

- the safety of cashless payments;

- their convenience;

- their potential automation, which is especially attractive where they form part of a series of recurrent transactions (wage and salary payments, orders to pay, invoicing, receipting).

(b) Instruments

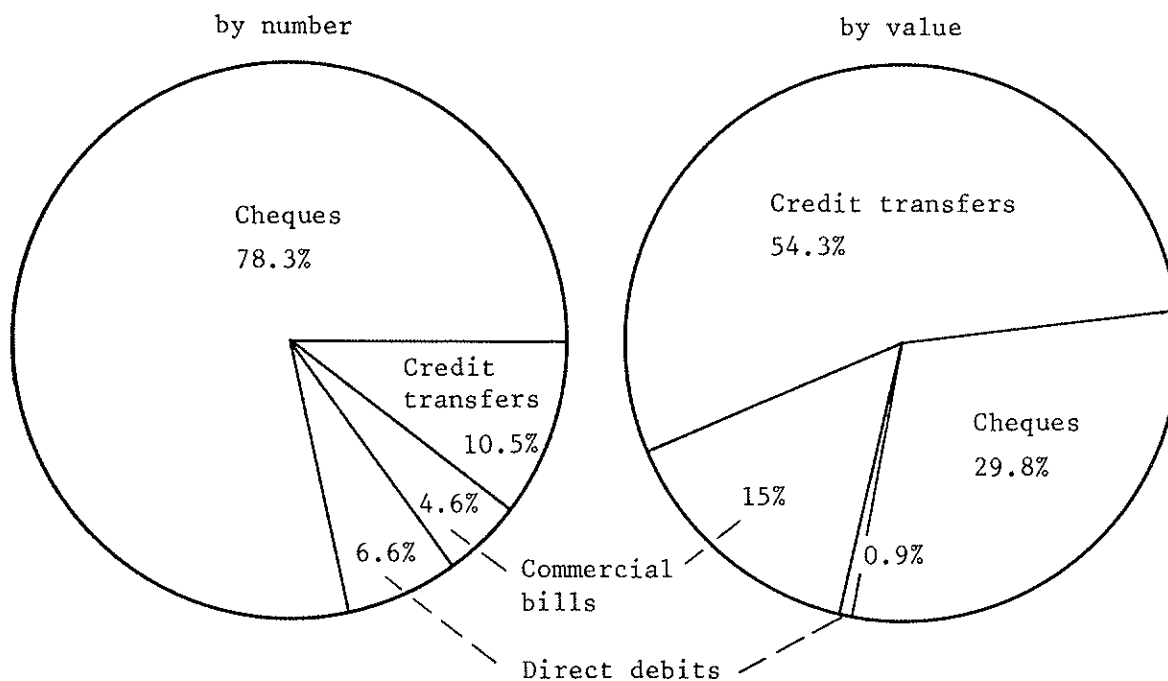
The most common forms of cashless payment are, on the one hand, the postal cheque, which may be used as a cheque or, if the drawer or payee so wishes, as a giro transfer\*2), and, on the other, the bank cheque, the interbank credit transfer, the commercial bill and the direct debit.

In 1977 the postal cheque centres, with 7.3 million accounts on their books, processed 964 million "transfers" for a total value of Fr.fr. 2,535 billion.

The banks and the credit institutions with special legal status together administer 28 million sight accounts, but statistics are available only for those transactions handled by the clearing agencies - in 1978 2,182 million items for a total value of Fr.fr. 11,051 billion.

A breakdown of these two figures highlights the predominance of the cheque in terms of number, and of the credit transfer in terms of value:

Breakdown of interbank exchanges according to instrument



## France

The cheque's place in cashless payments is all the more impressive when it is looked at side by side with the postal transfer, which, for the user paying for a purchase, is no different in nature.

### - Cheques

The most versatile of all the methods of payment, cheques are used both by businesses and by individuals. It is the latter that are responsible for the rapid increase in the number of cheques in circulation and for the proliferation of cheques made out for small sums. The average value of the individual cheque has declined steadily in recent years, amounting in the case of the bank cheque to Fr.fr. 1,924 in 1978.

A single household will write an average of eighty to ninety bank and postal cheques a year - of which twelve to fifteen are for cash withdrawals. It is estimated that individuals are nowadays responsible for almost two-thirds of all cheques written; of these, the average value is under Fr.fr. 400 and 30 per cent. are for less than Fr.fr. 100.

The advantages for the drawer of this method of payment are manifest: cheques are practical, no charge is made, debit is deferred. As for the payees, and particularly retailers, with time they have adapted fairly well, especially as the law has progressively been tightened, and again recently, to prevent cheques being drawn without cover. The measures taken include: centralised recording of cheque payment incidents at the Bank of France, obligation on drawee institutions to guarantee the payment of cheques for Fr.fr. 100 or less, bank prohibition on the issue of cheques for one year dating from the first unrectified incident and penal sanctions. On the other hand, cheque guarantee cards are not yet in widespread use.

The banks are the victims of the success of their own publicity and do not share the sense of satisfaction felt by users. The handling of such a large - and, moreover, constantly increasing - volume of paper is onerous and although the average cost of a cheque has fallen substantially over the past few years owing to the advanced mechanisation of processing operations, it is currently in the region of Fr.fr. 2.50 to 3. In the immediate term, no viable alternative would seem to exist. Transferring the cost to the drawer would at least require agreement among the credit institutions. It may, however, be noted that a network of mutual loan banks has for several years past charged its customers for the cheque forms it issues to them. In addition, one medium-sized institution very recently took a similar step, immediately prompting lively criticism from a consumers' association.

### - Credit transfers

Used by the Treasury's branch offices to settle government expenditure and by businesses to pay wages and salaries, the credit transfer would, given the volume of funds transmitted and the average value of individual transactions (Fr.fr. 26,336 in 1978), also seem to be the medium used for purely financial transactions.



- Commercial bills

Although their share in cashless payments is declining, commercial bills still enjoy considerable favour with businesses and banks on account of their dual function as an instrument for commercial payments and as a medium of discount, which is a form of cheap credit for the customer with little risk for the discounting institution.

- Direct debits

Of fairly recent origin, having been first introduced in 1965, the direct debit system has spread rapidly. Evolved for recurring payments (water, gas, electricity and telephone bills and hire-purchase instalments), it is ideally suited to automation. For some years now, taxpayers have even had the option of paying their income tax by means of automatic monthly debiting of their account.

- Other instruments

For the sake of completeness, mention should also be made here of credit cards, the bill of exchange statement (lettre de change-relevé - LCR) and the multi-purpose payment instrument (titre universel de paiement - TUP), although none of these accounts for a significant proportion of cashless payments. Credit cards have had only very limited success, although in the very recent past more extensive use has begun to be made of them. The LCR and TUP are innovations of which further mention will be made in connection with automation advances.

(c) Payment circuits

All credit institutions, whether or not they have a branch network, have their own internal flows, about which, with notable exceptions (Postal Cheque Office, Bank of France), little is known at present.

The various credit institutions exchange instruments either on the basis of bilateral agreements - correspondent relationships fall within this category - or in a multilateral, or even institutional, framework:

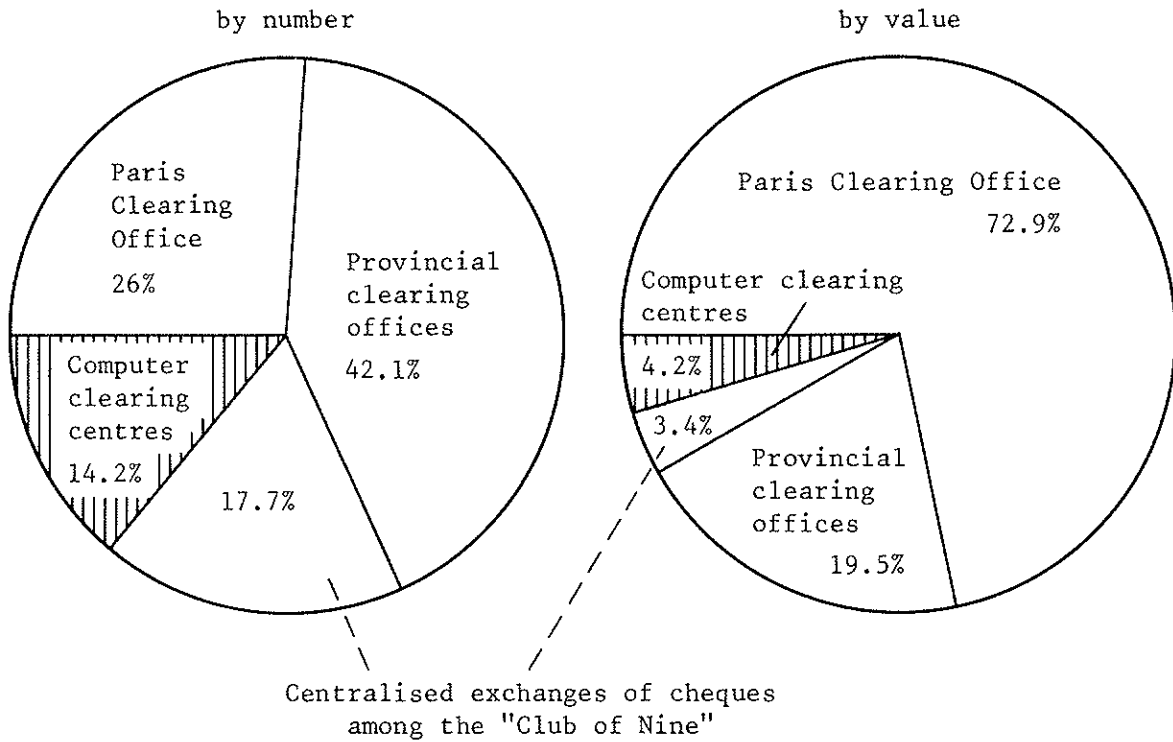
- Paris bankers' Clearing Office for traditional instruments.

- Provincial clearing offices, which handle only paper media and most of which operate in localities where the Bank of France has a branch. These offices will find themselves playing an increased rôle as a result of a recent decision of the National Credit Council that will come into force on 1st October 1980; as from that date banks will be obliged, with certain exceptions, to connect all their branches to the clearing office established in the departmental capital\*3).

- "Club of Nine", which organises the exchange in Paris of cheques payable both locally and in the provinces\*4).

- Computer clearing centres located in Paris, Lyons and Strasbourg which process automated transactions (see below), with magnetic tape as the medium for both outgoing and incoming traffic.

Breakdown of interbank exchanges according to "official" circuit



(d) Automation of transactions

The forms this takes or may take are very varied and often complementary.

- The computerised administration of customers' accounts today seems so much a matter of course that it would be easy to forget to mention it.

- The automation of instrument processing

Of the total number that are officially exchanged, more than 60 per cent. of interbank credit transfers and almost all direct debits pass through the computer clearing centres. The magnetic recording is,

moreover, often already done by the initiator, e.g. the Treasury, the electricity authorities, etc.

All cheques have for several years now incorporated a line of magnetic characters (CMC7) permitting the mechanisation of sorting and recording operations. More than 82 per cent. of the some 245 million cheques handled by the Bank of France in 1978 were automatically read and sorted in its Paris, Lyons or Poitiers centres. The other institutions, at least the major ones, have also set up a small number of large centres in an effort to group the instruments they handle, as a result of which there has recently been a trend towards centralised interbank exchanges of cheques, either at regional level (Banques Populaires, Caisses Régionales de Crédit Agricole, Crédit Mutuel) or at national level (members of the "Club of Nine" - see above - dealing solely with post-printed cheques). The appearance on the market of medium-capacity but comparatively inexpensive sorters is, at the same time, likely to work against this trend and to encourage the extension of automation. The idea of eliminating the physical exchange of the paper medium is not new to France: one project has already been studied, but bore no fruit; discussions are being pursued within the banking profession and an initial limited trial is to be launched in April 1980 by four banks in Rennes. On the other hand, note may be taken of a certain number of instances of cheque truncation being practised within a single institution or group of banks.

- The creation of new instruments: the bill of exchange statement (LCR) and the multi-purpose payment instrument (TUP).

The LCR is the automated version of the commercial bill\*5); its introduction in 1973 represented a further attempt to dispense with an instrument that was costly to handle, without sacrificing any of its functions. The exercise has not been a resounding success, with the LCR accounting for 7 per cent. in number and 4 per cent. in value of recorded commercial drawings.

The TUP, an innovation for which credit goes to the insurance companies, is a variation of the direct debit; it was conceived as a way of retaining the advantages of automation while giving the debtor the opportunity to keep a constant check on the amounts being debited from his account\*6). The introduction of this facility occurred too recently for its success to be evaluated.

- The automation of interbank exchanges, introduced in 1969 with the installation of the Paris computer clearing centre, extends to the credit transfer, the direct debit, the bill of exchange statement and the multi-purpose payment instrument; the tenacity of the traditional commercial bill and, above all, the continuing physical exchange of cheques, which alone account for 78.3 per cent. of the total number of instruments exchanged, reduce the present scope and future possibilities for automation.

At present no recourse is had to telecommunication resources either in relations between computer clearing centres and the participating institutions, or for links between the various computer clearing

## France

centres, or, more generally, for exchanges by other means between banks belonging to different groups.

### - The development of telecommunications networks

A number of financial institutions, in the forefront of which are those with a large branch network, have equipped themselves with telecommunications systems linking their branches to their data-processing centres. Teleprocessing has arrived in branch offices and seems set to make rapid advances.

Only through the automation of transactions, the main momentum of which has been sketched above, have the banks been able to cope with the rapid escalation of cashless payments; however, extensive as automation has been, it has not fundamentally changed the face of payment systems for the individual user. When an individual goes to his bank or savings bank there is an ever increasing likelihood of his finding terminals in use behind the counter, but - with the exception of automatic cash dispensers - he does not yet have access to them and tends to rely almost exclusively on cheques and cash for making his payments. There is, moreover, every reason to believe that this state of affairs will not change in the near future.

For the moment, automation directly concerns only the financial institutions and a few major users. It is not without its question marks and problems.

### - Centralisation or decentralisation?

The banks have not escaped the centralisation that has everywhere gone hand in hand with the introduction of computerised administration. The very size of the administrative centres they have set up to centralise the administration of customer accounts and the processing of cheques has sometimes given rise to social problems. The development of data-processing technology and progress in telecommunications seem likely to counter this trend.

### - Tariff structure for operations

Paradoxically, the structure of charges does not always favour the most highly automated transactions - a charge is made to the drawer for a direct debit but not for a cheque - and the banks have a marked tendency to charge for the new types of payment service.

This observation also applies to interbank operations: exchanges through the "Club of Nine" or the computer clearing centres involve the payment of a fee by the presenting bank to the recipient bank\*7). The problem of the terms to apply to exchange operations (time allowed for payment, charges) stands in the way of their modernisation.

On the other hand, the improvement in methods of processing and exchange has not always had favourable consequences for the user; centralisation has on occasion had as its corollary longer time-lags before cheques are collected and unpaid cheques are returned.

- The somewhat anarchic proliferation of exchange mechanisms

In addition to the "official" circuits, there has been a proliferation of individual agreements, involving both paper media and magnetic tapes.

(e) Rôle of the Bank of France

The Bank of France has no personal or commercial customers as such. However, its function as sole banker to the Treasury and the fact that it numbers among its institutional customers public utilities, such as the national railway and electricity authorities, and the banks, which may instruct it to encash instruments payable in localities where they have no representation, make it one of the most important collecting institutions.

In addition, the Bank's statutes assign to it the general responsibility of supervising the currency; it has for a long time now been active in promoting the provincial clearing offices and has more recently played an extensive rôle in the automation of exchanges, being, on account of the type of customer it serves, far and away the leading remitter of automated transactions, accounting for almost 30 per cent. of all presentations in terms of both number and value; it is hence very natural that it should have assumed responsibility for administering the computer clearing centres.

The development of means of payment is hence one of the Bank's constant preoccupations. Its interest is the stronger because the next few years are quite clearly destined to see the definition of the broad outlines of the future payment system, in which data processing and telecommunications will play a pre-eminent rôle.

It is important to ensure that the flaws which today mar the circulation of deposit money, and which are partly a consequence of the introduction of data processing and the mechanisation of processing - the somewhat anarchic proliferation of circuits in a manner determined by the participants' interests, the absence of rules of the game accepted by all, inconsistency with respect to the structure of charges - are not perpetuated tomorrow in automated procedures.

Aware of the importance and urgency of all these problems, the Bank embarked two years ago on studies and discussions concerning deposit money, which resulted in specific proposals at the very point when the Government was giving thought to the way in which a report on "The computerisation of French society" should be followed up. As far as the automation of financial transactions was concerned, the Government naturally turned to the Bank of France, and the Minister for Economic Affairs entrusted the central bank with the chairmanship and orientation of a working party on the development of means of payment in which all the parties concerned - banks, mutual loan banks, financial authorities and government representatives - take part.

The working party's terms of reference are clear:

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- to determine the approaches to which preference should be given,
- to define the general rules that the banks must apply for inter-bank exchanges,
- to provide a think-tank for the examination with the banks of the problems associated with the institution of a cheque truncation system and with the conditions for inter-network exchanges,
- to assemble views and to carry out the research required to permit practical experimentation with new electronic payment systems.

### IV. A HYBRID PAYMENT SYSTEM: THE POSTAL ORDER

The Postal Administration, which has a total of 17,000 offices spread throughout France and which can reach each and every address through the postman on his delivery round, offers users a hybrid funds transfer service, namely the ordinary postal order (the "Colbert").

The geographical transfer of the funds is effected by means of book entries, but the covering amount provided by the payer and the payment to the recipient tend to be in cash. In practice, postal orders are used by anyone who wishes to credit a postal cheque account or, more rarely, to make an out-of-town payment in cash, or by holders of postal cheque accounts who wish to transfer funds to persons unwilling to accept a cashless payment. The services responsible for administering social security benefits still make wide use of postal orders, in particular for paying old-age pensions.

In 1976 234 million postal orders, worth a total of Fr.fr. 471 billion, were drawn for domestic payments.

The number of transactions handled has been declining steadily since 1970, which is hardly surprising in view of the spread of the banking habit and the corresponding decline in the use of cash.

### Footnotes

- \*1) The percentages are calculated from the number of items recorded by the offices operated by the National Family Allowance Fund (Caisse Nationale d'Allocations Familiales), the National Wage-Earners' Sick Insurance Fund (Caisse Nationale de l'Assurance Maladie des Travailleurs Salariés), and the National Wage-Earners' Old-Age Insurance Fund (Caisse Nationale d'Assurance Vieillesse des Travailleurs Salariés).

- \*2) All that is needed is for one of them to indicate on the form the number of the payee's postal account and the address of the postal cheque centre at which the account is held.
- \*3) Hitherto, cheques drawn on places where there was no clearing office had to be directly presented to the paying branch by the institution presenting the cheque or by its correspondent.
- \*4) The "Club of Nine" is made up of the following credit institutions: Banque Nationale de Paris, Société Générale, Crédit Lyonnais, Crédit Industriel et Commercial, Crédit du Nord, Crédit Commercial de France, Banques Populaires, Caisse Nationale de Crédit Agricole, SIBES (an association of some regional and local banks).
- \*5) The LCR eliminates the physical transfer of the bill of exchange with the coded magnetic recording of the draft as soon as it enters the banking circuit for collection or discounting. The drawer may even, in certain circumstances, present his bank with magnetic tapes. The exchange of LCRs takes place via the computer clearing centres. The paying banker prepares a "statement" of the bills of exchange to be paid on maturity, which is sent to the debtor for approval or rejection.
- \*6) The TUP, which is normally accompanied by a notice to pay (bill, statement, etc.), is addressed by the drawer (insurance company, public utility, etc.) to its customer, who has the choice between payment by debit against his bank account, by postal transfer or in cash at a post office. The debtor's written consent can thus be obtained for each transaction. The TUP, which carries a reference inserted by the drawer and can be read optically, is subsequently processed automatically either at the TUP processing centre (in the case of bank debits) or at the Postal Administration's optical reading centre.
- \*7) Except in the case of credit transfers.





4. G E R M A N Y



I. INTRODUCTION

The Federal Republic of Germany is a densely populated and highly industrialised country with a comparatively large gross national product (1978: DM 1,283 billion, the equivalent of US\$ 639 billion). The money stock (M1) available to the economy at the end of 1978 to finance the production and turnover of goods and services amounted to DM 238 billion (US\$ 130 billion). Over two-thirds of this sum was held in the form of deposit money (i.e. sight deposits of non-banks) and just under one-third in the form of cash. Altogether, about 4.3 billion cashless payments totalling DM 9,500 billion (US\$ 5,200 billion) were made by non-banks in 1978. The number and total amount of cash payments, by contrast, are not known. The findings of studies conducted in the United Kingdom, which suggest that between 35 and 40 billion cash payments are made per year\*1), probably give some indication of the prevalence of cash payments in Germany as well, since the relationship of the money stock (M1) and its components (currency in circulation and sight deposits) to the gross national product is very similar in the two countries. Even so, cash payments would account for only some 15 per cent. of all payments made.

II. CASH PAYMENTS

1. Historical basis of the system

Bank-notes and coins are the instruments of cash payments. Until the beginning of the 18th century, coins were the only payment medium, but nowadays they are used solely as small change. Their intrinsic value is not generally their face value ("token coins").

In Germany the bank-notes of the central bank have been legal tender since 1910. Until 1914 they were convertible into gold coins, gold bars or foreign exchange and were not subject to compulsory acceptance. When the First World War broke out in 1914 the obligation to redeem them for gold was lifted; while reintroduced by law in 1924, it was suspended de facto by exchange controls (except from 1930 to 1933).

Whereas in Germany the right to issue notes has been vested in the central bank since 1875 (until 1935 four regional State banks were permitted to issue bank-notes), the right to issue coins has, except between 1948 and 1950, been the prerogative of the central government since the founding of the Deutsches Reich in 1871.

2. Legal basis

Under the constitution of the Federal Republic of Germany monetary sovereignty, i.e. the power to regulate all monetary matters, is vested in the Federal Government. This sovereignty comprises currency sovereignty (safeguarding the value of money at home and vis-à-vis other currencies); and note and coin sovereignty (regulations on the nature and

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denomination of notes and coins). In Article 3 of the Act of 26th July 1957 (Bundesbank Act) it is stipulated that the Deutsche Bundesbank, making use of its powers in the field of monetary policy, shall regulate the money circulation and the supply of credit to the economy with the aim of safeguarding the currency and shall ensure the due execution by banks of payments within the country as well as to and from foreign countries. Under Article 14 of the same Act the note-issuing monopoly is conferred on the Bundesbank.

Coin sovereignty is regulated by the Coinage Act of 8th July 1950, as amended by the law of 18th January 1963. Federal coins, like Deutsche Mark notes, are legal tender, but there are limits on the amounts that have to be accepted. With the exception of Federal cash offices, including the cash offices of the Federal Postal Administration and Länder cash offices, nobody is obliged to accept coins denominated in Deutsche Mark in amounts exceeding DM 20 (US\$ 10.94), or coins denominated in Pfennig in amounts exceeding DM 5 (US\$ 2.74). The minting of Federal coins in excess of an amount equivalent to DM 20 per head of the population is subject to the approval of the Central Bank Council of the Bundesbank. Moreover, coins must be redebited to the Federal Government if, during a period of six months, the average stock of coins held by the Bundesbank uninterruptedly exceeds 15 per cent. of the total amount of coins in circulation. At the end of 1978 there was DM 107.30 (US\$ 58.70) worth of coins in circulation per head of the population.

### 3. Agencies handling cash payments

Notes and coins are put into circulation via the giro account-holders at the branches of the Deutsche Bundesbank (Landeszentralbanken), viz. primarily via the banks, public authorities (such as the Federal Railways and the Post Office) and major business enterprises. They receive the cash, which tends to be in large amounts, against cheques, and put it into circulation through wage and salary payments. However, an increasing number of enterprises have switched to cashless wage and salary payments in recent years, so that such payments have shifted from company pay offices to banking halls. The cash is used to pay for goods and services and then flows back to the banks, savings banks and public authorities. The banks hold between 6 and 10 per cent. of the total amount of currency in circulation (at the end of 1978: DM 5.2 billion, the equivalent of US\$ 2.8 billion) in the form of cash on hand.

### 4. Participants in cash payments

All enterprises and individuals engaged in economic activity, such as producers, distributors, consumers and public authorities, participate in cash payments. Their payment habits determine the demand for cash. Recourse to cash payments may be presumed to be most significant in the case of households, and least significant in the case of enterprises and public authorities. German retailers, in particular, expect to be paid in cash. Some payees also prefer cash payment because it ensures that payment is duly received.

5. Payment media used

The currency in circulation consists of bank-notes in seven denominations ranging from DM 5 to DM 1,000 (US\$ 2.74 to 547), and Federal coins in eight denominations ranging from DM 0.01 to DM 5 (US\$ 0.005 to 2.74). Furthermore, special coins and commemorative coins have been issued in denominations of DM 5 and DM 10 (US\$ 2.74 and 5.47). At the end of 1978 total cash in circulation had a value of DM 81.4 billion (US\$ 44.5 billion), bank-notes accounting for DM 74.9 billion (US\$ 40.9 billion) and Federal coins for DM 6.6 billion (US\$ 3.6 billion) (including DM 5.2 billion (US\$ 2.8 billion) of cash on hand at banks). It thus rose by 13.5 per cent. compared with 1977. In value terms, DM 100 notes accounted for 49 per cent. of all the payment media (notes and coins) in circulation at the end of 1978.

The amount of currency in circulation is as a rule highest at the end of a month, and generally reaches its lowest level in the third week of a month. At present the fluctuations in the amount of currency in circulation range between DM 1.6 and 4.9 billion (US\$ 0.9 and 2.7 billion) in the course of a month.

6. Nature of the payments made

In Germany, in contrast to the United States, households make most of their payments in cash. In department stores, supermarkets, petrol stations and railway ticket offices payment is made by means of bank-notes and coins, while coin-activated machines are often used for issuing tickets for local public transport. Although the eurocheque (guaranteed by means of a cheque card) has already penetrated into sectors where formerly payments were made in cash, payment in cash is often faster, easier and more efficient than drawing a cheque, the use and payment of which, moreover, attracts bank charges.

No data are available in Germany on the average value of payments in cash.

7. The rôle of the central bank in cash payments

Under Section 3 of the Bundesbank Act, the Deutsche Bundesbank is required to regulate the volume of money in circulation and thus to provide the economy with bank-notes and coins in the denominations required. In accordance with the note-issuing prerogative conferred on it by law (Section 14 of the Bundesbank Act), the Deutsche Bundesbank is responsible for producing and regularly renewing bank-notes, replacing damaged notes, calling in notes and checking the circulation of payment media to detect counterfeit money (Sections 36 and 37 of the Bundesbank Act).

In contrast to the Acts concerning the central bank in force between 1875 and 1945, the Bundesbank Act contains no specific regulation concerning cover for the notes issued.

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The note-issuing prerogative is limited both geographically, being confined to the ten Federal Länder and the Land of Berlin; and in terms of denomination, as notes in denominations smaller than DM 10 may be issued only with the agreement of the Federal Government (conflict with the minting prerogative of the Federal Government).

In 1978 DM 182.6 billion (US\$ 100 billion) was paid into giro accounts at the offices of the Bundesbank and DM 194.1 billion (US\$ 106 billion) was paid out from giro accounts. The bank-notes issued, which totalled some DM 74.9 billion (US\$ 41 billion) at the end of 1978, return to the central bank approximately three times in the course of a year.

On returning to the central bank bank-notes are checked, and unsightly, damaged or dirty notes are separated and destroyed. In 1978 561 million bank-notes (i.e. about 51 per cent. of the total number in circulation) weighing 502 tonnes were destroyed; in value terms this amounts to DM 22.7 billion (US\$ 12.4 billion), or about 33 per cent. of the notes in circulation.

The Bundesbank is obliged to replace damaged bank-notes if the bearer either presents parts of a note which together make up more than half of the note, or furnishes proof that the remainder of the note of which he presents only half or a smaller part has been destroyed. A record is kept at the Bundesbank's head office in Frankfurt of the numbers of all severely damaged notes or parts of notes that are replaced to ensure that no duplication of refunds occurs.

The Bundesbank and all banks are required by banking law to detain forged or altered bank-notes or coins (counterfeit money) and all bank-notes and coins suspected of being counterfeit. The Bundesbank may call in bank-notes if, for instance, numerous counterfeits of a specific type of note occur. The notes that are called in become invalid at the end of the period for exchange fixed at the time of recall.

Federal coins are put into circulation by the Bundesbank in its capacity as the fiscal agent of the Federal Government. Counterfeit coins or coins that are called in or have become unfit are withdrawn from circulation. When it takes possession of newly minted coins the Bundesbank credits the giro account of the Federal Minister of Finance with the equivalent.

### 8. Degree of automation achieved

In spite of the high volume of cash payments in the Federal Republic of Germany, its automation is only at a very early stage.

At present only mechanical coin and bank-note counting machines are used at banks, department stores, supermarkets, etc. In individual cases money-issuing machines are used in the banking industry in order to save counter staff. The steady increase in the number of bank-notes in circulation has also caused the Bundesbank to streamline their manual processing (approximately 3 billion bank-notes are currently taken in each year), i.e. checking to see they are complete, genuine and fit for

circulation, separating those that are fit from those no longer fit for circulation, and counting, by introducing semi-automatic machines (ISS 300 = about 6,000 bank-notes per hour). These machines check not only visible features but also electronically recognisable features which have been incorporated in bank-notes for some years to attest their genuineness and condition. Trials of the ISS 300 have been successfully concluded. It is planned to use over one hundred such machines in the branches of the Bundesbank.

9. Assessment of the cost-effectiveness of the present cash payments

The strict security requirements for the safe-keeping of currency holdings and cash on hand, and the manual methods that still have to be used for processing bank-notes and coins mean that the handling of cash payments is at present very labour and cost-intensive.

Even if, expressed in terms of the gross national product, the importance of currency should continue to diminish in the future (between 1950 and 1978 currency in circulation declined from 8.3 per cent. to 6.4 per cent. of GNP, its hold on the public will not be broken. A country in which 35 billion cash payments compare with only 4.3 billion cashless ones is a long way from turning into a cashless society.

III. CASHLESS PAYMENTS

1. Historical basis

The starting point of cashless payments in Germany was the local clearing set up by local merchants in the Hanseatic city of Hamburg in 1619. After its foundation in 1875 the central bank (Reichsbank) extended this procedure to form a supra-regional giro system for the entire area of the Reich, thus making it possible to transfer money quickly and easily from one place to another. In about 1900 the central bank's example was followed by the commercial banks (i.e. essentially the big banks which were emerging at the time) and the credit co-operatives, and in 1909 the Post Office and the savings banks also followed suit.

2. Legal basis

Under the Banking Act any bank in Germany wishing to handle non-cash payments (giro business) for customers in a manner that constitutes a banking transaction requires a licence from the Federal Banking Supervisory Office. The central bank may carry out payment transactions in accordance with the Bundesbank Act, and the Post Office in accordance with the Postal Administration Act and the Post Office Act.

There are no specific laws governing the organisational and technical aspects of handling non-cash payments; these aspects are covered by the general provisions of the Civil Code, in particular those concerning

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agency law. However, the banks are expressly forbidden to keep credit or deposit accounts on which the customer may draw on a non-cash basis only, because the banning or restricting of cash withdrawals at one point led to abuses and would nowadays increase the banks' lending capacity and thus hamper the central bank's credit policy.

As cashless bulk payments can be dealt with efficiently only if they follow a certain fixed pattern, their handling, as far as the law permits, is regulated by standardised contracts or, in the case of the Post Office, by statutory orders. To be precise, relationships with bank customers are governed by the General Business Conditions of the banks and the central bank, by the User Conditions of the Post Office, by special regulations and notices, and by standardised forms, while relationships among banks and the Post Office are governed by the General Business Conditions of the account-keeping office concerned, and by various agreements between the central associations of the banking industry, the Federal Ministry of Posts and the central bank.

### 3. Agencies handling cashless payments

Cashless payments in Germany are currently handled by savings banks, commercial banks, credit co-operatives, the Post Office and the central bank. In 1978 the individual agencies handling cashless payments accounted for the following percentages of giro accounts, sight deposits and payment orders:

Banking group	Number of giro accounts (end of year)	Value of sight deposits of non-banks (end of year)	Number of non-bank pay- ments executed (during the year)
Total	47 million	US\$ 91 billion	4.3 billion
Savings banks	47%	38%	46%
Commercial banks	19%	32%	17%
Credit co-operatives	26%	19%	14%
Post Office	8%	6%	21%
Central bank	less than 1%	5%	2%*

\* For the amount of the central bank's clearing transactions, see Section 8 below.

### 4. Participants in cashless payments

In Germany almost all payments involving business enterprises and public authorities are effected by cashless means. For example, the right to use cash to settle tax debts at the tax authorities' offices or to draw unemployment benefits or children's allowances in cash from the social security offices has been very considerably circumscribed by law



(Tax Code). Citizens are expected to make their payments to the tax authorities either via their accounts or by paying in cash at a bank.

In Germany, which has a population of some 61 million, about 47 million giro accounts were held at the banks and the Post Office at the end of 1978. Of this total about 10 million were business accounts and, about 37 million were private accounts. Consequently, at least on paper, all Germany's 24 million households have a giro account. With the introduction of the eurocheque system many individuals in recent years started to use cashless means to pay for more expensive purchases (there were 13.1 million eurocheque card-holders at the end of July 1979).

5. Instruments of cashless payments

Cashless payments are effected mainly by means of credit transfers (60 per cent. of payments in 1978), cheques (12 per cent.) and direct debits (28 per cent.). Other payment media such as receipts, crossed money orders, freight money orders and bank cards play a comparatively minor rôle (less than 1 per cent.).

Credit transfers predominate in Germany; almost all (92 per cent.) of the payments handled by the Post Office take this form. In the banking industry, however, the relative importance of credit transfers has been declining for some years (in the savings-bank sector, for instance, they accounted for 70 per cent. of cashless payments on behalf of customers in 1967, 66 per cent. in 1972 and 54 per cent. in 1978). This development is attributable not so much to the banks, which in principle prefer credit transfers as a means of maintaining liquidity, as to the economy's need to use other more appropriate payment methods for specific purposes.

A credit transfer is an order given by a customer to his bank to arrange for the sum of money indicated in the order to be debited from his account and credited to the payee's account at the latter's bank. To simplify the credit transfer system and as a service for customers, standing orders for credit transfers can be issued to the bank for regular payments (such as rent). The bank then undertakes to execute the credit transfer on the date specified. When invoicing customers, some payees (e.g. insurance companies) also send the payer pre-prepared credit transfer forms stating the name of the payee bank, which the customer completes simply by inserting details of his bank account and by adding his signature.

The cheque has never been as popular in Germany as in most countries in the industrialised world. One reason for this is the preference given to credit transfers by, in particular, the savings banks organisation and the Post Office; in addition, the central bank did not introduce a multilateral collection and clearing system for cheques until 1950. Since then cheque payments have increased steadily, although their share in cashless payments has declined in the past ten years (in the savings-bank sector, for instance, from 22 per cent. to 11 per cent. of cashless withdrawals by customers). During this period two contrary trends were apparent: as automation progressed, business enterprises switched on a large scale from cheques to credit transfers and on an even larger scale

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to direct debits, because these two types of payment order can be issued direct from automated data bases on magnetic tapes and submitted in this form to the banks for execution. Moreover, the interest that accrues in the interval before cheques are debited was in part offset by the steady rise in associated postage costs. On the other hand, individuals' use of cheques as a payment medium for consumer goods and services has been increasing since the banks started to guarantee the payment of cheques (eurocheques) for up to DM 300 issued in conjunction with a cheque card. However, the charges levied for cheque cards, cheque forms and cheque transactions are an obstacle to the faster expansion of the eurocheque system.

Under German law cheques may not be certified in such a way that the drawee bank is obliged to pay. The purpose of this prohibition is to prevent cheques acquiring a function similar to that of bank-notes. In this respect an exception is made for the central bank, which may confirm the payment of cheques drawn on it when cover is available.

The direct debit, which was introduced by the banking associations in 1963, has greatly simplified the collection of regular payments (subscriptions, rents, fees, taxes and the like). Nowadays one cashless payment in four is a direct debit in Germany, while in the savings-bank sector the proportion is one in three.

The direct debit is an item for collection made out by the creditor (payee) and presented to his bank for the collection of the equivalent amount 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 claims on the payer are settled on time. However, this presupposes the payer authorising either his bank (the paying agent) to pay direct debits drawn on him or the payee to collect the amount under the pre-authorized debit procedure.

To simplify the settlement of payments, customers with EDP equipment can also record pre-authorized debits on magnetic tape and submit these to the banks for collection. The magnetic tapes can be processed in the interbank clearing system considerably more efficiently than vouchers and also permit automated entries in the payers' accounts.

### 6. Handling of cashless payments

The payment orders are sorted by the banks into those concerning the bank itself (internal transfers), local banks (local payments), or banks in other cities (intercity payments). Credit transfers, cheques and direct debits for local banks are transmitted to them through the local clearing centre of the central bank or through the accounts they maintain in each others' books or through clearing centres in other cities. The money transfer forms for banks in other cities are passed on to them through the banking group's own giro system or the central bank's system. Urgent payments (in the savings-bank and credit co-operative sectors, for instance, all credit transfers of DM 1,000 (US\$ 547) and over, and in the central bank all transfers of DM 10,000 (US\$ 5,470) and over) are transmitted by post or cable to the account-keeping bank of the payee. All

other payment vouchers for banks in other cities (some 80 per cent. of the total) and the credit transfers and direct debits recorded on magnetic tape are passed on by the bank first instructed to the computer centre concerned, where the vouchers or data carriers are automatically recorded and reconciled, and then sorted and listed by recipient bank or their respective clearing office. Upon receipt of the payment records at the recipient banks, the giro accounts of the customers are credited with the amounts of the credit transfers or debited with the equivalent of the cheques and direct debits. The credit transfer and direct debit vouchers are passed on to the customers together with the statement of account, while the cheques are retained by the banks.

The time taken by a credit transfer or a cheque depends on the distance the payment has to cover and the procedure used. Payments between account-holders living in the same city take one to two working days to process, payments between account-holders in different cities between three and five working days. A certain proportion of the payments take longer to process, e.g. if the originator of the payment has not indicated the sorting and routine codes correctly (or at all) on the voucher, or if either the rail or air connections for transporting the payment records between the clearing centres or the postal links with the destinations are poor.

#### 7. Types of payments

In 1978 the average amounts were as follows (by types of payments):

	<u>Savings banks</u>		<u>Central bank</u>	
	DM	US\$	DM	US\$
<u>Paper-based payments</u>				
Credit transfers	3,400	1,860	19,270	10,540*
Cheques	2,200	1,200	2,030	1,110
Direct debits	920	500	1,700	930
<u>Magnetic tape payments</u>				
Credit transfers	500	270	800	440
Direct debits	200	110	160	90
<u>Telegraphic transfers</u>				
Credit transfers	not known		4,650,000	2,544,000

\* Not representative.

From the point of view of the originator (bank customer), cashless payments may be irregular payments (individual payments) or regular bulk payments such as credit transfers of salaries and pensions. Individual

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payments are as a rule paper-based, and a small proportion of them (large amounts) are made by cable. Bulk payments, by contrast, are primarily made by magnetic tape. This explains why the average amount of paper-based payments is larger than that of payments on magnetic tape. The average amount of cable transfers is the highest of all; this payment method is used by the banks and major enterprises for transferring balances between accounts on the same day.

No studies have as yet been conducted in Germany on payment flows between the household, business and public sectors.

### 8. The rôle of the central bank in cashless payments

The function of the central bank in the field of domestic payments, as prescribed by law, principally consists of ensuring the smooth operation of bank payments and, in particular, of providing clearing facilities for interbank payments. With its 209 branches and local clearing offices and eleven computer centres, the Deutsche Bundesbank constitutes the link between the giro systems of the banking industry and the Post Office. In 1978 the clearing facilities of the central bank were used for making 427 million local payments (293 million credit transfers and 134 million cheques and direct debits), and 807 million intercity payments (133 million credit transfers and 674 million cheques and direct debits).

Thus, 1.2 billion payments in all were routed through the clearing facilities of the central bank. The comparatively small share of the central bank in intercity credit transfers (about 13 per cent. as against a share of some 50 per cent. in collections) is mainly due to two factors. For one thing, the Post Office maintains accounts with almost all banks and can therefore transmit its credit transfers to them direct, without using the services of the central bank. Secondly, on account of liquidity considerations, the institutions, particularly the savings banks and credit co-operatives, tend wherever possible to channel the sums to be transferred through their own giro systems to the city of the payee and only there - if the payee does not have an account with a local bank affiliated to the giro system used thus far - to pass on such sums in the local clearing to the bank indicated in the credit transfer order. This procedure is encouraged by the "option clause" printed on the credit transfer forms, which permits the banks to credit the funds to an account of the payee other than the one indicated in the credit transfer order. Unlike credit transfers, the execution of which leads to a loss of liquidity for the bank entrusted with the execution of the payment, cheques and direct debits presented for collection are passed on as soon as possible to other giro systems, and thus also to the central bank, because they result in an increase in liquidity.

Besides its clearing function, the central bank acts as the fiscal agent of the Federal Government and handles its payments. In 1978 about 50 million credit transfers (mainly salaries, pensions and social security payments) and some 20 million collections were executed on behalf of the Federal Government.

9. Degree of automation achieved

The automation of cashless payments in Germany started in 1971 with the introduction of machine-optical voucher reading and was extended in 1976 with the advent of the paperless exchange of data media (magnetic tape procedure). The vast majority of intercity payments (credit transfers, cheques and direct debits for banks in other cities) are now processed automatically at forty-five computer centres. As far as the central bank is concerned, almost 93 per cent. of the approximately 3.5 million payments effected per working day are routed through the eleven computer centres of the Bank. About 60 per cent. of these payments are on machine-readable OCR-A vouchers and about 40 per cent. on magnetic tapes (i.e. almost 1.3 million data records per day). At the instigation of the banking industry the magnetic tape procedure is constantly expanding. The Ministry of Finance has furthermore requested all public authorities to use magnetic tapes whenever large numbers of credit transfers have to be made. This procedure has in fact proved so efficient that some paper-based payments are being converted into paperless payments at the computer centres (using magnetic tape or telecommunications); thus, the eurocheques received for collection at the German eurocheque Centre (Deutsche eurocheque Zentrale (DeZ), Frankfurt am Main) which have been drawn abroad in foreign currency by German tourists holding a cheque card are recorded on security tapes and the equivalent of the cheques in Deutsche Mark plus a fee are collected from the German drawees by means of direct debits using the magnetic tape procedure. On request, the original cheque can be obtained from the DeZ to clarify any problems which might arise (1978: 0.84 per cent. of the total). This procedure is similar to the Belgian system of cheque truncation.

As far as international payments are concerned, the starting of SWIFT heralded a major advance towards automation in this field.

The clearing of payments at a local level, i.e. between banks in the same city or the same region, has not yet been automated. Initial steps in this direction have, however, been taken in Frankfurt, Hamburg and Hanover.

10. Agencies and organisations responsible for the functioning of the payment system

In accordance with the duty assigned to it by law of making banking arrangements for the handling of domestic and external payments, it is important to the Deutsche Bundesbank, as the central bank, that cashless payments should be handled smoothly, speedily and safely. The central bank performs this task partly by providing all banks and the Post Office with free local and regional clearing facilities, as described above, and partly by either steering the work of the bodies which organise or automate payments (as in the case of the committees on questions of automation and security) or by advising them. It also exerts a certain influence on the banks' terms for handling payments through its General Business Conditions.

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In the event of payments being unsatisfactorily handled (e.g. if legitimate complaints about excessively long processing periods are lodged by individuals), the Federal Banking Supervisory Office may also intervene.

### 11. Assessment of the cost-effectiveness of cashless payments and steps taken to improve them

To sum up, it is fair to say that cashless payments in Germany are handled much more efficiently, and thus at lower cost, than they were ten years ago because during this period the vouchers, bank numbers and test numbers used in payments, and the procedures for transmitting and safeguarding payments have been standardised in the course of automation, and because the handling of large quantities of payments and the booking thereof has been facilitated by the use of magnetic tapes. The extension of the cheque truncation system to include domestic cheques not exceeding DM 500 has been under discussion for some time; when it is achieved, the magnetic tape procedure will be expanded even further. The efforts of the central bank and the banking industry are now mainly directed towards speeding up intercity payments by improving data transmission for urgent (large) payments, and including local payments in the automated procedure.

## III. HYBRID PAYMENTS

### 1. Semi-cash credit transfers

The banks and in particular the Post Office offer not only purely cashless payment services but also facilities for combined cash/deposit money transfers, i.e. if the payee has a giro account but the payer has not, or vice versa, semi-cash credit transfers can be made. Persons without a giro account can pay in money at any bank or post office by means of a money order/credit transfer form for transmission to a giro account, or have funds transferred to them for cash outpayment at any bank or by the postman. As the latter procedure, under which the funds transferred are delivered by the postman, is very labour-intensive and risky (hold-ups!), the Post Office some years ago developed a new payment instrument, the "crossed money order". This instrument is primarily intended for business enterprises and public authorities which deal with many customers who have no giro account or whose bank is not known. The originator of the payment submits a magnetic tape with the necessary data to the Post Office, which prints it out on money order forms using a high-speed printer. After the account of the originator has been debited, the Post Office sends the money orders to the payees direct. The payees can then cash the instrument at any post office or submit it to their bankers, like cheques, for collection.

2. Automated cash/deposit money transfers

Vending machines for selling goods (such as cigarettes, food for a journey) when shops are closed, or services (such as tickets, parking meters, etc.) have been in operation for years. They do not, however, involve access to customers' accounts. This possibility is afforded by the use of automated cash dispensing machines at banks (cash dispensers (CDs) or automated teller machines (ATMs)).

In Germany about 200 cash dispensing machines, mostly in the form of late counters or night counters, have been installed in recent years. They can be used only by the customers of the installing bank, and all of them operate off-line.

Hitherto the capacity of these machines, tied as they are to individual banks, has not been fully exploited. The central associations of the banking industry and the Deutsche Bundesbank therefore reached agreement in May 1979 on a uniform interbank system of automated cash dispensing machines. This concept will allow the customers of all banks joining the system to obtain cash from such machines on certain conditions by using a eurocheque card with a magnetic code line and a personal code number (PIN). Each member bank will thus make the cash dispensing machines it operates available (on an interbank basis) for use by the customers of other member institutions. To minimise the risk involved only one outpayment of up to DM 300 is to be possible on any one day. The amounts paid out by cash dispensing machines operating in such an interbank system, together with any fees payable, will be collected from the drawee bank by direct debit under the procedure for the paperless exchange of data media.

Footnote

- \*1) See Peter Hirsch & John Railton, Cash Rules UK, OK? in the Journal of the Institute of Bankers, April 1978, pp. 66 and 67.





5. I T A L Y



I. INTRODUCTION

The transition from the conventional payment system based mainly on the use of cash to one operating through the combined use of "money" and banking services and, at a later stage, electronic technology for the transfer of funds presupposes a major socio-economic change.

In the case of Italy - a country with a high population density of 57 million inhabitants in an area of 301,000 square kilometres - it should be remembered that it is only since the end of the Second World War that this process of structural change has accelerated sufficiently for the country to be regarded today as an industrial economy developing towards a service economy. Naturally, the economic growth of the last thirty years (between 1950 and 1978 real per capita income increased more than threefold), the rise in consumer spending and the general improvement in the standard of living as a result of changes in the distribution of income, the expansion of the financial markets and the emergence of new market operators have greatly enlarged the magnitudes involved, not only in absolute terms but also in relation to both national income and per capita income. This has led, in the first place, to the expansion and reorganisation of the banking system, side by side with the postal network, to create an infrastructure able to cope with these magnitudes\*1) and, secondly, to the development of a small number of new payment instruments within the context of a modified, more active modus operandi of the banking system focusing more on the banking needs of the corporate and public sectors than those of individuals.

The central bank, which is endowed by law with broad powers of intervention\*2), has played an important rôle in both regards, closely following all initiatives directed towards improving the national payment system.

It must, however, be borne in mind that in Italy, where the working population (totalling about 21 million) has little regular direct contact with the banking system and consumer credit accounts for only a small percentage of total lending, conditions are ill suited to the introduction of new payment instruments - except perhaps in the long term - or the radical transformation of existing payment media possibly to exploit the opportunities offered by modern technology. Furthermore, a large number of personal payments (such as taxes, rent or instalment repayments on personal loans) are deducted at source by the employer. This explains the extensive, but unquantifiable, use made of cash to settle transactions\*3) and the apparent preference on the part of individuals to deposit their liquid funds with the Postal Administration - historically one of the earliest "banks" in the country and traditionally regarded as very reliable - rather than with the banks, although the latter are forbidden by law to promote business by approaching prospective customers direct. This preference is confirmed by the number of accounts opened with the two systems: current accounts, which are held mainly by businesses (although in recent years the proportion of personal accounts has increased), are concentrated almost entirely with the banking system, which counted 11.6 million such accounts at the end of 1978, compared with 0.6 million opened with the Postal Administration; at the same date

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savings accounts, in which a large part of personal savings are deposited, totalled 63.2 million with the Postal Administration (including interest-bearing savings certificates) and 34.2 million with the banks. Unsurprisingly, given the lower economic potential of individuals, the balances on the two kinds of accounts held with the Postal Administration came to little more than one-tenth of the corresponding figure for the banking system at the end of 1978.

## II. THE PAYMENT SYSTEM

In very simple terms, a payment system may be depicted as a pyramid in which three components act and interact. Beginning at the base, these three components are:

- (a) individuals and businesses,
- (b) the banking system and the Postal Administration, and
- (c) the central bank.

The basic objective pursued by the "managers" of such a pyramid (principally the central bank and the banking system in Italy) is to facilitate the transfer of funds so as to achieve the dual result of:

- (a) reducing the use of cash and increasing that of instruments that are less costly to handle;
- (b) minimising the time taken to make transfers, at the very least eliminating the lag between the transfer and booking of the operation.

The structure described above gives a series of relationships that can be reduced to three basic categories:

- (a) direct relationships between economic agents of the same type (e.g. direct payments between individuals, interbank transactions, etc.);
- (b) indirect relationships between economic agents of the same type through the intermediary of one or more economic agents of another type (e.g. payments between banks through the intermediary of the central bank);
- (c) direct relationships between economic agents of different types (e.g. transactions between individuals and banks).

Clearly, then the managers of the payment system will direct their efforts to achieving at least three intermediate objectives:

(i) the improvement of existing payment instruments (e.g. better quality bank-notes, machine-readable cheques, cheques with a payment guarantee, etc.);

(ii) the introduction of new instruments better suited to economic agents' needs (recent examples include the direct crediting of accounts in Italy or the new instruments introduced in other countries for the settlement of trade credits);

(iii) the raising of the standard of bank and, especially, interbank services in order to ensure that the advantages gained internally through automation are not lost as operations pass from one bank to another. The success of initiatives of the SWIFT type can be attributed to this factor.

Turning now to a detailed analysis of the payment system, the subject can be approached from various angles - that of individuals and entities making and receiving payments, noting preferences for this or that payment medium; that of payment instruments, classified traditionally into cash, deposit money, hybrid instruments and "electronic money"; that of the intermediaries managing these instruments (the central bank, the banking system, the operators of electronic funds transfer systems and possibly others).

This paper takes the last perspective, which appears to be the most appropriate in the case of Italy. The main characteristics of the intermediaries are described briefly below.

### III. THE STRUCTURE OF BANKS AND OTHER FINANCIAL INSTITUTIONS

The classification of institutions providing means of payment in Italy dates back about forty years (Banking Law of 1936). The various categories are as follows:

#### 1. The central bank

Two bodies jointly perform the functions of the central bank although they are separate legal entities - the Italian Exchange Office, which is responsible for implementing exchange controls and managing the country's foreign exchange reserves\*4), and the Bank of Italy, which is empowered to perform banking functions\*5) and to issue cashiers' cheques and bank-notes under Article 1 of its Statutes. In addition to the responsibilities deriving from its Statutes, the Bank carries out other functions laid down in law or in agreements concluded with the Government. These include the provision of collection and payment services for the Government (Provincial Treasury Offices), the operation of the clearing houses and the supervision of the financial institutions, etc.

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### 2. Deposit-taking institutions

This category covers all the institutions that can be classified as public or private banks. These institutions can be further subdivided according to the form of bank (public-law banks, banks of national interest, ordinary commercial banks and the branches of foreign banks, co-operative banks, savings banks and first-class pledge banks, rural and artisans' banks and second-class pledge banks, numbering 1,071 in all on 31st December 1978). In accordance with the principle of specialisation in credit business on which Italian banking legislation is based, these institutions generally take deposits at sight or short term (up to eighteen months) and grant short-term loans.

Part of the demand for payment instruments is met by the Treasury and the Post Office.

### 3. The Treasury

The Treasury can be considered to have a dual rôle as a financial intermediary carrying out credit activity on behalf of the Government and as a direct recipient of payments. Its liabilities consist mainly of short and long-term fixed-interest securities, advances received from the Bank of Italy and notes and coin it issues itself.

### 4. The Postal, Telegraph and Telephone Administration

It accepts deposits from the public and effects transfers of funds. The funds raised are used by the Deposits and Loans Fund (Cassa depositi e prestiti), an institution within the Ministry of the Treasury, mainly for granting finance to local government bodies.

The rôle of each of the intermediaries mentioned above in the Italian payment system are examined in turn below, with particular attention being paid to the Bank of Italy, for the reasons explained in the Introduction.

## IV. THE BANK OF ITALY

### 1. The issue of bank-notes

#### 1.1 The institutional framework and the division of the right of issue

Under Law No. 1262 of 25th June 1926, the Bank of Italy has been the only institution authorised to issue bank-notes and to control their circulation since 1st July 1926. The present legal basis of the right of issue was, however, laid in the Banking Law promulgated in 1936 (Decree-Law No. 375 of 12th March 1936, converted with various amendments into Law No. 141 of 7th March 1938). The Bank is not legally obliged to maintain a fixed reserve of gold or foreign exchange as cover for its notes.

The procedure for the introduction of new notes requires first a law passed by Parliament establishing the new denomination and then decrees issued by the Minister for the Treasury defining the intrinsic and formal characteristics, the quantity to be printed and the date on which the new notes will be put into circulation.

The entire bank-note production cycle is performed in a modern printing works run by the Bank itself under the supervision of the Minister for the Treasury; production costs came to about Lit. 20 billion in 1978 (US\$ 24 million).

Bank-notes issued by the Bank of Italy are legal tender for all payments that have to be made within the country in domestic currency.

## 1.2 The breakdown of bank-notes in circulation by denomination

The present structure of the Italian currency is the result of the programme of reorganisation begun immediately after the bout of inflation in 1946-47. The main purpose of this programme was to give the Bank of Italy the sole right to issue bank-notes in denominations of Lit. 1,000 or more and to give the Treasury exclusive responsibility for issuing token coinage with a face value of Lit. 1,000 or less and, if necessary, paper currency in denominations of less than Lit. 1,000 (see Section V.1.).

At present the Bank is authorised to produce bank-notes in denominations of Lit. 1,000, 2,000, 5,000, 10,000, 20,000, 50,000 and 100,000 and to put them into circulation through its own branches. The 1,000-lire note is the sole survivor of the denominations produced before the Second World War; the others have been introduced gradually since then as the value of money has changed.

For some years the Bank of Italy has been replacing its entire range of bank-notes with notes in the same denominations as before but more hard-wearing and distinctive.

On 31st December 1978 there were 1,317 million bank-notes in circulation, representing a total value of Lit. 19,551 billion (US\$ 23.2 billion); the average outstanding for the year as a whole came to Lit. 16,405 billion (US\$ 19.5 billion). The per capita note circulation at the end of the year amounted to 23 notes to the value of about Lit. 345,000 (US\$ 410).

The value of notes in circulation doubled between 1973 and 1978. In the breakdown by denomination the 10,000-lire note accounts for the largest proportion (41.8 per cent. of the total) followed by the 1,000-lire note (29.8 per cent.). The predominance of the 10,000-lire note and the growing circulation of 50,000 and 100,000-lire notes may be taken as an indirect confirmation of the fact that in Italy the use of bank-notes is not limited to low-value transactions.

Furthermore, the value of notes in circulation (and possibly also that of coin - see Section V) expressed as a proportion of gross national

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income - about 9 per cent., compared with about 13 per cent. in 1951 - and the ratio of notes in circulation to the total money supply (about 15 per cent.) show that although cash has declined in relative importance it will continue in the years to come to occupy a significant place in the range of Italian payment instruments.

The average life of bank-notes in circulation ranges from twelve months in the case of the 1,000-lire note to forty-eight months in that of the 100,000-lire denomination. In 1978 the cost of producing the different issues varied from Lit. 36 for the 1,000-lire note to about Lit. 100 for the 100,000-lire note.

Finally, it should be mentioned that a debate has been under way in Italy for many years on the reform of the monetary unit by changing the nominal value of the lira (the so-called "scudo" or "new lira" or "heavy lira", etc.).

### 1.3 The level of automation reached in the handling of bank-notes

The huge volume of bank-notes in circulation, the numbers produced each year (292 million in 1978) and the expectation that they will continue to be used as payment instruments have made it imperative to seek reliable means of handling bank-notes automatically.

For some time now the Bank's note-printing works have been using machines to sort, count and check new bank-notes. In recent years the greatest automation problem has been that of counting, assessing condition and checking for possible forgeries among used notes, which return to the branches of the Bank of Italy once a year on average.

A special machine - called Selenota - has therefore been designed which can handle some 10,000 notes per hour (compared with an average of 18-20,000 notes processed in a day by a checker), identifying probable forgeries on the basis of certain security features, checking the condition of the notes on the basis of their light reflectance and completeness and classifying them into notes fit for reissue, notes for destruction, probable forgeries and notes to be examined.

A number of prototypes of this machine have been built and are already in operation, although they are still undergoing development; they are being fitted with a computerised optical character reading device able to produce a list of the serial numbers of the bank-notes in each batch processed.

A smaller version of the device - called "Miniselenota" - with similar features is being developed for possible installation in the branches of the Bank too.

## 2. Other payment media issued by the Bank of Italy

In addition to bank-notes, the Bank of Italy provides for the issue of certain other payment media - the cashier's cheque (vaglia cambiario) and the free bank cheque (assegno bancario libero).



Cashiers' cheques are issued for amounts of not less than Lit. 5,000 (subject to certain exceptions) and not more than Lit. 500 million against cash payment to the Bank of Italy; they are cashable upon presentation by the beneficiary at any bank and are accepted in payments to or on behalf of the state.

At present two series of cashiers' cheques are available - ordinary and special. Ordinary cheques, of which 779,000 for a total value of Lit. 5,254 billion (US\$ 6.2 billion) were issued in 1978, come in seven denominations\*6) and are used for all types of payment, but their widespread use for current transactions may be ruled out in view of the high average unit value (Lit. 6.7 million, the equivalent of US\$ 7,957). The second series, which was introduced only recently, consists of two denominations\*7); these cheques can be encashed at any bank or at the Bank of Italy. The Bank prepares them by automated means on the basis of data supplied on magnetic tape by government departments and other institutions. At present such instruments are used in connection with the services the Bank performs for the Treasury for paying tax rebates (1,266,000 drafts issued in 1978 totalling Lit. 83 billion (US\$ 98.6 million) with an average unit value of Lit. 65,000, the equivalent of US\$ 77.2) and severance awards to state employees of some social security institutions (87,000 issued in 1978 totalling Lit. 452 billion with an average unit value of Lit. 5.2 million).

It is worth noting that payments by means of special cashiers' cheques (instead of, for example, by payment orders cashable at branches of the Bank of Italy) have prevented an otherwise inevitable increase in the workload of the Bank's branches. If the plan to issue a special "state cheque" for the payment of salaries to state employees\*8) is implemented, the Italian payment system will come a step closer to its goal of developing instruments that partly replace cash\*9).

The free bank cheque is similar to the cashier's cheque; however, they may be drawn on the branches of the Bank of Italy by domestic correspondents that have been authorised to issue them following the deposit of suitable collateral. The use of this instrument has declined steadily in recent years and in 1978 it was practically nil.

3. Other payment instruments provided for the banking system by the Bank of Italy

The Bank's network of 97 branches enables it to provide a giro transfer service for the banks and institutions that hold free deposits and lombard loan accounts with it; the service is particularly efficient as a result of the use of a nationwide data transmission system.

Until a few years ago this instrument was used to promote more efficient liquidity management in the banking system by allowing liquid funds to be redistributed instantaneously within an individual bank or group of banks interlinked by correspondent and business relationships. It also enabled the Bank of Italy, at both branch and Head Office levels, to monitor more closely the movements of money between banks and bank branches as well as regional financial flows and thus regulate the supply

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of notes to its own branches. This objective can now be pursued better by means of the "single centralised account for advances and deposits", which is described in Section IV. 4.2.

### 4. The clearing services provided by the Bank of Italy

Besides the instruments listed above, the Bank provides the credit institutions and certain categories of agencies and individuals\*10) with a number of services that can be grouped together under the heading "clearing".

Since 1926 the Bank has run clearing houses at ten of its branches and has provided clearing services through branches in towns without a clearing house. The only difference between the services provided in the clearing houses and those available in other branches lies in the range of operations that can be performed and the number of participants involved.

#### 4.1 Types of operation

The Bank of Italy performs three distinct types of clearing operation:

(a) the daily clearing of banking articles in the clearing houses and clearing offices; almost all the participants are credit institutions which use it to exchange bills of exchange, drafts, cheques, invoices, receipts, coupons, drawn or maturing securities, giro transfer orders, credit and debit orders and other transactions agreed or otherwise carried out between members. In 1978 articles worth Lit. 1,308,437 billion (US\$ 1,554 billion) were exchanged, an increase of 15 per cent. over the previous year: between 1973 and 1978 the value of articles cleared increased threefold.

(b) the daily settlement of spot securities contracts concluded against cash on the stock exchange and over the counter and any other movement of shares, bonds or government securities among the participants, comprising the credit institutions, stockbrokers, jobbers, financial institutions and major companies as well as the Provincial Treasury Offices run by the Bank of Italy. In 1978 the value of such settlements came to Lit. 22,180 billion (US\$ 26 billion).

(c) the end-of-month settlement (at present carried out in the clearing houses in Florence, Genoa, Milan, Naples, Rome and Turin) of forward securities contracts concluded in the stock exchange and over the counter among the clearing house members indicated under (b) above; it is here too that the inter-house settlement of securities transactions between operators in different towns is carried out. In 1978 the total value of securities cleared came to Lit. 10,390 billion (US\$ 12 billion).

No statistics are available, however, on the number of items exchanged among the participants in any of these three types of clearing operation, nor on the number and amount of those transactions which are settled outside the official clearing circuit.

#### 4.2 The automation of the clearing services

In June 1976 the Bank of Italy began to introduce an automated procedure with remote data transmission linking the various local clearings into a system that formed the basis for clearing articles at national level. This system deals only with accounting and the production of documentation for the participants, the physical transfer of the articles cleared being effected in the traditional way (by post or by other means), but it allows direct settlement between banks in different towns and enables banks with branches in several parts of the country to settle their position vis-à-vis all the other clearing members by debiting (or crediting) a single balance on their account at the Bank of Italy. The cycle of operations begins at 8.30 a.m. in the individual clearing houses and clearing offices and finishes by 4.30 p.m. at the latest on the same day.

In parallel with the single centralised settlement of clearing balances, a "Single centralised account for advances and deposits" was created; each bank opens a centralised account in its name at just one branch of the Bank of Italy to which all its branches may make credits or debits in real time, including those deriving from the centralised settlement of clearing balances. These new operating facilities have enabled the banks to manage their liquid reserves much more efficiently and have undoubtedly also increased the effectiveness of monetary policy. The centralised settlement of balances resulting from the cheque clearing (and from debts and claims of any other kind) vis-à-vis the rest of the banking system and the holding of a single account with the Bank of Italy have enabled the banks to reduce considerably the volume of liquid funds deposited at the central bank, as previously each branch of a bank had to hold liquid balances at the corresponding branch of the Bank of Italy, so that the total deposits of each bank were very large and costly given the low rate of interest they bore.

During 1977 the daily and monthly settlement of securities transactions was also automated by the introduction of a centralised procedure based on a small, newly established data transmission network linking six clearing houses in real time to the EDP department of the Bank of Italy. One of the results of this innovation has been a reduction in the time required to effect the book-keeping operations involved, as the largely repetitive tasks carried out by the clearing house staff have been standardised and appreciably reduced.

#### V. THE TREASURY

As has already been noted the currency circulation in Italy includes not only bank-notes issued by the central bank but also subsidiary state currency consisting of notes and coin.

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### 1. The composition of the state currency

As at 31st December 1978 the Treasury was authorised to have 500-lire notes and coin with face values of Lit. 1, 2, 5, 10, 20, 50, 100, 200, 500 and 1,000 produced by the State Printing Works and Mint and to put them into circulation, chiefly through the branches of the Bank of Italy. The 1 and 2-lire coins are no longer struck or used in view of their low nominal value. All the coins of the two highest denominations are struck in silver and are mainly issued to celebrate important anniversaries\*11).

At the end of 1978 the total value of coin in circulation amounted to Lit. 430 billion (6,826 million coins) and that of 500-lire notes to Lit. 145 billion (US\$ 511 and 172 million, respectively). This represents less than 3 per cent. of all currency in circulation in Italy at that date; it is used in millions of small daily transactions (such as buying newspapers or telephone tokens), for paying public transport fares (e.g. buses, trams) and in vending machines (e.g. cigarette machines, token dispensers).

### 2. Recent problems associated with the coinage

The legislation establishing token coinage sets limits to the amount for which it is legal tender\*12). However, this provision has seemed anachronistic of late in view of the shortage of coin, which has posed considerable problems. The imbalance between the supply of and demand for coin, which may be attributed to a series of interrelated factors (difficulties in expanding production at the Mint, various forms of hoarding by shop-keepers, individuals, coin-collectors and tourists, the increasing use of coin-operated machines) has obliged the public to resort to various substitutes, such as telephone tokens, bus tickets or postage stamps. In 1976 and 1977 widespread use was made of bankers' drafts for small fixed amounts (so-called "mini-drafts"). These have now completely disappeared with the expansion of the Mint, and a marked reversal of the trend is expected. This would seem to be confirmed by the per capita figure for the number of coins in circulation, which rose from 96 at the end of 1977 to 120 at the end of 1978.

## VI. THE POSTAL ADMINISTRATION

The significant rôle played by the Postal Administration as a depository of financial assets of the personal sector has already been mentioned in the Introduction. As the Postal Administration can issue medium or long-term securities in the form of savings certificates which complement the traditional savings passbooks, they are at an advantage over the ordinary banks, which, with a few exceptions, may only accept funds at short term.

We shall deal briefly with the Postal Administration's activities as part of the Italian payment system and the efforts it has made in recent years to automate its operations.

1. The Postal Administration's payment instruments

The payment instruments that the Postal Administration provides for the public are the postal current account and the money order.

1.1 The postal current account

Anyone can open a current account at a post office, although the majority are held by businesses and public bodies. At the end of 1978 there were 600,000 such accounts, on which 400 million transactions (inpayments, withdrawals and giro transfers) were carried out. Most of the payments to these accounts are recurrent (such as television licence dues, motor-vehicle licence duties, magazine subscriptions, hire-purchase instalments on durable goods) and are generally made with printed forms on which the amount, the number of the account to be credited and the name of the payer have to be indicated. The forms may be presented at any post office, which accepts the amount in cash, returns part of the form to the payer as a receipt and has the beneficiary's account credited. The same forms may also be used by holders of postal current accounts; by signing the form and giving the number of their own account instead of their name, they can have the amount due transferred from their account to that of another account-holder (giro transfer). The volume of payments made to current accounts is so large that the Postal Administration has automated the service (see also the following section), introducing a new form on which the information required for automatically crediting the beneficiary's current account is printed in optically readable characters when the cash is paid in over the counter. A proportion of the withdrawals from postal current accounts relates to the payment of pensions by social security institutions.

1.2 The money order

Another means of payment that the Postal Administration provides, in this instance for payments among individuals who do not hold current accounts, is the money order. It is issued against payment in cash and is sent through the post to the post office nearest to the beneficiary's residence; he may either collect the amount in cash from the post office or have it credited to his own bank account. This instrument may also be used for telegraphic transfers of funds. In 1978 about 19 million money orders were issued. This figure has not changed much in the last ten years, probably because of the growing use of alternative means of payment, especially the personal cheque.

2. The level of automation reached

Some years ago the Postal Administration drew up a plan for the automation of postal current accounts that has now been put into effect

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and is being gradually extended throughout the country - the so-called Bancoposta.

This service comprises a national electronic processing centre in Rome, which is responsible for keeping all the automated accounts, and sixteen regional centres in the largest provincial capitals, which receive and process the related documents. The book-keeping data are then sent to the national centre for the accounts to be updated.

Each regional centre is linked by terminal to a number of post offices. The installation of terminals in the 1,300 largest post offices has reached an advanced stage. The automation of this service makes it possible to carry out debit, credit and giro operations in real time throughout Italy.

## VII. THE BANKING SYSTEM

### 1. Introductory remarks

While the banking system in Italy may be considered large enough to cope with the volume of money and credit it is called upon to intermediate, for many years it did not play a major part in the area in which we are interested here, namely in creating new payment instruments to replace the use of cash. An analysis of why this should have been so, giving the rôle of payment medium almost exclusively to cash, fiduciary instruments issued by the banks (bankers' drafts) and cashiers' cheques issued by the Bank of Italy (see Section IV.2.)<sup>\*13</sup>, is outside the scope of this study, the cause lying in a complex web of socio-economic factors such as the mentality of the public, the small number of personal bank accounts, the absence of legislation to encourage the public to use cashless instruments, the low level of competition among banks in Italy, the fragmentary nature of the retail distribution network and the low unit value of purchases. All these factors help promote the use of cash.

Nevertheless, for the reasons noted in the Introduction, Italian banks began in the mid 1960s to adopt the modern operating techniques of banking systems elsewhere and introduce new types of payment instruments. There is, of course, still a long way to go before the banks can offer such a range of instruments as is available in other countries and, not least, before they are as widely used; it is partly for this reason that the examination of these instruments is less detailed than that of cash.

### 2. Cashless payment instruments

#### 2.1 Cheques

In Italy, as elsewhere, the most important cashless payment instrument is the bank cheque, in the two forms of the personal cheque and the banker's draft.

To be able to deal efficiently with the growing volume of personal cheques (about 700 million in 1978) most of the banks have installed equipment to read the magnetic-ink characters printed on cheque forms in accordance with the agreement reached some years ago within the Italian Bankers' Association.

In the large banks at least, cheques drawn by customers on one branch and presented for collection at another branch of the same bank (slightly more than 40 per cent. of the total) are debited from the drawer's account via the teleprocessing network interlinking the bank's branches. The cheque is then sent to the branch on which it is drawn and is not returned to the customer. Some banks are in the process of introducing different methods for handling cheques, such as centralising them at their EDP centres or head offices, on the cheque truncation principle, although this is limited to low-value cheques drawn on branches of the same bank.

Cheques drawn on other banks (about 60 per cent. of the total) may be cleared either between the two banks direct if an agreement exists to do this or through the clearing houses and clearing offices run by the Bank of Italy (see Section IV.4.). In this case settlement takes about four days on average.

#### 2.1.1 Personal cheques

The current account, on which cheques may be drawn and which bears interest, was the most profitable source of funds for the banks until the 1974 fiscal reforms. Taking advantage of the fact that interest rates, value dates and other conditions governing the opening of bank current accounts are open to negotiation between the bank and the customer within the limits set by a gentleman's agreement among the banks (the Interbank Agreement on Banking Conditions), the banks sought to promote the growth of current accounts at times when money was particularly tight by offering higher interest rates than those paid on savings deposits. At the end of 1978 savings deposits still accounted for Lit. 87,877 billion (US\$ 104 billion) out of total deposits of Lit. 189,716 billion (US\$ 225 billion), whereas Lit. 101,839 billion (US\$ 121 billion) was held in current accounts.

The high yield offered by the banks on current accounts has led to some growth in the number of personal accounts. However, the use of personal cheques, which is now fairly common in the business sector, is still rather limited among individuals, who use them mainly for cash withdrawals. The reason for this probably lies in the fact that individuals regard deposits on a bank current account as financial assets - of which there is a greater range in other countries - rather than as money for payment transactions.

Other factors discouraging wider use of personal cheques by individuals were and still are:

(a) the high cost, mainly in the form of stamp duty on the cheque forms. This cost, which is proportionally high in the case of small payments, is a concurrent factor in limiting the use of cheques to medium

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and large payments and encouraging the use of bank-notes for smaller amounts;

(b) the difficulty in cashing personal cheques not only at a bank other than the one on which it is drawn but even at a branch of the same bank other than the one at which the customer's account is kept. In order to overcome these limitations the Italian banking system has introduced various measures:

- (i) a special identity card called a cheque card bearing the account number and sometimes a photograph of the customer. The drawee bank undertakes to honour all cheques up to a set amount (usually Lit. 100,000) even if the balance on the drawer's account is insufficient to cover it or if it has been cashed at another bank. According to a recent estimate about 400,000 cheque cards have been issued, of which only 10-15 per cent. are active (used at least once a year).
- (ii) pre-covered cheques (assegni a copertura garantita or assegni vademecum), and limited-amount cheques (assegni a taglio limitato). In this instance the customer may, upon request, be issued with a book of cheque forms each printed with the maximum amount for which it is valid. When the cheque book is issued the total of these amounts is transferred from the customer's ordinary account to a special account on which he can draw only with the cheques in question. It is not known how many account-holders use such cheques; reliable estimates put the number at about 200,000.

In order to complete the picture it should be mentioned that euro-cheques and eurocheque cards are also issued in Italy; about one-third of the cards in circulation are issued by one large bank. Eurocheques are not used as frequently as elsewhere, however, partly because of exchange control restrictions on the use of cheques abroad.

### 2.1.2 The banker's draft

A further payment instrument used alongside the personal cheque is the banker's draft, which can be likened to a money order or a traveller's cheque for use within the country. In contrast to the personal cheque, it is issued only by banks authorised to do so by the monetary authorities (about 60 at the end of 1978) for amounts deposited at the time of issue. This makes them much more reliable and guarantees a high degree of acceptability to creditors and banks other than the issuer. More widespread use is hampered by the financial requirements imposed on the issuing institutions, such as the lodging of collateral with the Bank of Italy that can amount to the full value of the drafts to be issued when the value of those in circulation exceeds the share capital of the issuing institution.

At the end of 1978 the total value of such drafts in circulation came to Lit. 2,890 billion (US\$ 3.4 billion).



### 2.1.3 Travellers' cheques

These are issued mainly by banks or companies (such as American Express) belonging to international groups; the amount issued is very small.

### 2.2 Credit cards

Credit cards, which are a recent innovation in Italy, are issued by both banks and non-banks, in general mainly on the basis of income criteria. At the end of 1978 there were fewer than one million credit cards in circulation, of which only a small percentage (between 10 and 15 per cent.) was actually used. It is estimated that during the year transactions to the value of about Lit. 100 billion (US\$ 119 million) were settled by this means. The number of card-holders is not known, but since the bulk of the cards are issued by the Visa group, the Banca Commerciale Italiana (the so-called Identity Account) and the Credito Italiano (Eurocard), it may safely be assumed that the number of card-holders is not very different from the number of cards issued.

In Italy credit cards are held almost exclusively by individuals and the limited success with which they have met so far can be attributed to the low propensity of individuals to use banking services. Traders are not excessively fond of the cards either, as the advantages they bring (sales promotion and reduced risk of fraud or hold-ups) would be largely offset by the cost involved, in the form of the percentage of the value of sales retained by the issuing institutions.

In order to complete the picture, mention should be made here of the "cards" issued by some large stores, supermarkets and car-hire companies and used to purchase their goods or services or to obtain special discounts. They are of minor importance.

### 2.3 Giro transfer., direct credits and pre-authorised payments

It has already been noted that some time ago the banks developed their own data transmission systems linking their branches to head office. The existence of such a network favours the spread of automated systems for the transfer of funds used by individuals for giro transfers and pre-authorised payments and by major customers for making recurrent inpayments and outpayments. In the latter case the necessary data are sent to the bank in writing or on a magnetic carrier and the bank has the amounts credited to the recipients' accounts either directly if it holds the accounts itself (direct crediting) or by using special procedures if they are held by other banks. There is provision for payment to be made by banker's draft if the beneficiary has no bank account.

The balances on interbank accounts are settled among the banks by crediting or debiting the centralised accounts held at the Bank of Italy.

Direct credits are used at present by a large number of firms for paying staff wages and salaries, partly in order to avoid the risks in transferring large quantities of cash. However, wages and salaries paid in this way still represent a minor proportion of the total. The

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difficulties in extending this new form of payment are partly psychological (lack of confidence in banking services and in cheques) and partly economic and practical (the cost of cheques and the time spent queueing at bank counters to cash them). A better understanding of banking services and the installation of cash dispensers at the place of work would overcome such drawbacks and helps these more modern methods of payment to win acceptance.

### 2.4 Promissory notes

This instrument is widely used in Italy for payments that in other countries would be effected by standing order or giro transfer. It is used primarily for instalment payments on consumer durables, such as television sets, cars or boats. The forms can be bought from any tobacconist at a set price inclusive of stamp duty, which is proportional to the nominal value and maturity of the note. The purchaser signs it and the salesman generally presents it to a bank, which credits the amount to his current account after deduction of a percentage discount. At maturity the purchaser repays the bank in cash or by having his account debited.

Since discounted notes can be sent for collection at a bank other than the discounting bank, the transactions are settled through the clearing houses and clearing offices run by the Bank of Italy.

### 2.5 Cash dispensers

There are about one hundred cash dispensers in Italy; they are operated off-line and are generally to be found only at banks' main branches. Siting away from bank premises is subject to authorisation by the Bank of Italy on the criteria, firstly, that the proposed location is suitable for such a service (e.g. railway stations, sea and air ports, large stores or wholesale food markets) and, secondly, that the introduction of such machines does not distort banking competition, particularly if they are provided by only a few banks or are restricted to a small area. In addition to these constraints the banks have to contend with the public's view of cash dispensers as merely an emergency source of cash outside banking hours.

It should be noted that at present the number of transactions effected on each of the cash dispensers that have been installed is far below the level needed to make them cost-effective.

The number of cash dispensers might increase as more are installed in large factories and commercial premises to allow withdrawals to be made up to a certain number and amount (usually Lit. 100,000 or 200,000, the equivalent of US\$ 119 and 238, respectively) at any time of day.

There should be a similar development in the 1980s with the introduction of automated teller machines to replace a certain number of counter positions.

VIII. PROJECTS BEING IMPLEMENTED DOMESTICALLY

We have already seen that the Bank of Italy plays a major operational rôle in the payment system. Its functions are not limited to those described above, however; it also plays a part in stimulating and co-ordinating projects in the banking system in order to bring about an improvement in the services and payment instruments provided for the community.

1. The Interbank Society for Automation (SIA)

The most important achievement to date has been the establishment of the Interbank Society for Automation (SIA - Società Interbancaria per l'Automazione) in Milan in 1977. The entire banking system holds shares in its capital either directly or through the central institutions for the various categories of bank. The statutory aim of the SIA is to develop and operate an automated procedure for effecting collections and payments requested by bank customers by the crediting and debiting of current accounts.

The activities of the SIA, which will begin in 1980, will take the following form:

- banks and major customers (such as businesses, public utilities and public agencies) that have been so authorised by the banks will send payment and collection orders (credit transfers, salaries, pensions, taxes, electricity, telephone and gas bills, repayment instalments on loans, insurance premiums, rents, etc.) to the SIA on machine readable media; the Society will distribute them to the member banks recorded on the same medium within twenty-four hours;
- each day the participating banks will receive notification of the balance to be settled in the next day's clearing.

It is estimated that the SIA should handle between 40 and 50 million transactions a year, with daily peaks of about 400,000. The computer system that is being installed will initially operate in batch mode; at present it is foreseen that the Society's field of operations will later be extended to include, for example, the centralised operation of a system for handling share and bond transactions and the creation of an interbank network of cash dispensers that can be used by the customers of all the banks.

2. The Automated Telecommunications System between Italian Savings Banks (STACRI)

One project that is already in operation in the savings-bank sector is the Automated Telecommunications System between Italian Savings Banks (STACRI - Sistema di Teletrasmissione Automatica tra le Casse di Risparmio Italiane), which is being developed by the IPACRI (Istituto per

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l'Automazione delle Casse di Risparmio Italiane\*14)) and administered by the ICCRI (Istituto di Credito delle Casse di Risparmio Italiane\*15)). The system provides a teleprocessing link between the member banks (about eighty in number) for the automated handling of giro transfers, payment orders, cheques and other types of payments between member banks and also message switching and data transmissions. Transactions will be booked to the accounts maintained by each bank with the ICCRI, thus eliminating the 3,000 or so correspondent accounts that currently exist between the savings banks. Traffic is estimated at about 40,000 messages per day, rising to twice this number within four years. In spite of the fact that it is at present restricted to the savings banks, the STACRI is an important project that could later be extended to include, for example, cash dispensers operated jointly by the savings bank sector, securities transactions and foreign exchange operations.

## IX. INTERNATIONAL PAYMENTS

In the international payments field the system operated by SWIFT (Society for Worldwide Interbank Financial Telecommunication) was a great success with the Italian banking system from its very inception. It also met with the approval of the central bank, which provided co-ordination at the technical level.

As a result of this convergence between banking-system interests and central-bank action about one hundred financial institutions joined the system, many of them small or medium in size. They have made such extensive use of the SWIFT network that Italy comes third after the United States and the Federal Republic of Germany in terms of traffic volume.

Interesting developments have followed with regard to the automation of payments in general. With a notable lack of standards for automated payments, a fair number of banks are modelling the formats, security features and other aspects of their own internal systems on those already devised for the SWIFT system. At a later stage this should facilitate the exchange of payments data among the banks.

## X. CONCLUSIONS AND PROSPECTS FOR THE FUTURE

The payment system in Italy has a number of distinctive features. Cash is the predominant payment medium and will remain so for several years to come\*16)). Some cashless instruments, such as the cheque, are only just starting to become payment media for the public at large and are generally used by businesses and by individuals in the middle to high income bracket. Payments with other instruments represent a small proportion of the total.

The Italian payment system in the 1980s and beyond will probably present a different picture depending on whether one is looking at (a) transfers of funds between banks, (b) payments by public bodies and businesses or (c) payments by individuals.

In the first case the projects that are already under way (such as SIA, STACRI and SWIFT) and any that may result from improved co-operation among the banks should lead to the gradual replacement of conventional paper-based payment media by EDP-based media similar to the National Automated Clearing Houses (ACHs) in the United States.

The gradual shift away from the use of cash by public bodies and businesses, in particular for the payment of wages and salaries, will be accelerated by the growing use of the direct crediting of accounts, possibly preceded or accompanied by wider use of bankers' drafts, cashiers' cheques of the Bank of Italy and postal money orders.

Recurrent payments by individuals should gradually be transferred to the system of giro transfers and pre-authorized payments in parallel with the growth in the use of bank current accounts. Such an expansion, which might also entail greater use of personal cheques, would probably be influenced strongly by whatever decisions were reached by public bodies and businesses with regard to direct credits.

Individuals will continue to make their current payments in cash. This should lead to some expansion in the use of instruments of the cash dispenser type that facilitate the distribution and use of cash. Credit cards are not likely to make a better showing in the next five years unless the banks decide to launch a large-scale publicity campaign to boost interest in them.

If the trends indicated above are to become established, the following prerequisites must be met:

(a) the ability of payment instruments to evolve in line with the socio-economic development of the country and changes in the public's banking habits without attempting to force the pace, which in some cases could lead to rejection;

(b) a careful campaign by the banking system to win over the public;

(c) abandonment of the more extreme forms of individualism that are evident even today in the banking system in favour of a commitment to co-operation and collaboration;

(d) the absence of outside influences of any kind, in particular of manufacturers, on the banks' choice of equipment and techniques;

(e) constant adaptation of the regulations by the central bank to suit the needs of the banks and the public.

There is one final aspect that deserves to be stressed. The hardware and software available to the Italian banking sector for achieving a good standard of automation in the payment system is fully adequate to

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meet present and future needs\*17). Difficulties could arise, however, in the telecommunications sector.

The national communications network, which was created mainly to meet the need for voice communications, does not meet the efficiency, security and cost requirements of data transmission and is thus unsuitable for the transmission of payment transactions. In order to overcome this problem, the telecommunications authorities have drawn up a five-year plan for establishing a primary network consisting of a number of completely digital nodes for packet switching to which will be linked a secondary network using electronic switching apparatus connected to the lines of the present telephone network. As with this system the circuits will not have to be used for longer than is strictly necessary for the transmission, it will be more efficient and secure and will bring cost savings for the small user. Moreover, continuing technological development should make it possible not only to link up small users but also to integrate the various systems created at the national and international levels.

Footnotes

- \*1) As at 31st December 1978 there were 12,104 bank branches (compared with 7,400 in 1948), against 13,459 post offices. The network of post offices also covers some communes that are not served by the banks. It should be borne in mind that the communes without bank branches are extremely small and generally only a few kilometres away from communes where there is a bank branch.
- \*2) See Section IV. below.
- \*3) This preference is encouraged by existing legislation on the acceptable forms of payment, particularly to the public administration, which gives cash a privileged place otherwise accorded only to matured coupons on securities issued or guaranteed by the Government and certain special cheques issued by the Bank of Italy (see Section IV.2.).
- \*4) The Italian Exchange Office is an institution incorporated under public law; although it is independent in its administration and accounting, it has payments and collections also carried out on its behalf by the branches of the Bank of Italy, which supplies it with the necessary funds in lire to purchase foreign exchange resources.
- \*5) Today this task corresponds broadly to that of "lender of last resort" to the rest of the banking system.
- \*6) Up to Lit. 100,000, from Lit. 100,001 to 500,000, from Lit. 500,001 to 1,000,000, from Lit. 1,000,001 to 5,000,000, from Lit. 5,000,001 to 10,000,000, from Lit. 10,000,001 to 100,000,000 and from Lit. 100,000,001 to 500,000,000.
- \*7) Up to Lit. 10,000,000 and from Lit. 10,000,001 to 100,000,000.
- \*8) Up to the present time there is no legal requirement in Italy for wages and salaries to be paid by cheque or by credit to an account.
- \*9) The procedure for issuing and using the state cheque jointly with the Treasury has already been worked out; it also provides for the possibility of paying the amount due by credit transfer. Implementation awaits passage of the necessary legislation.
- \*10) In 1978 there were 1,371 participants in the clearing; apart from the branches of the Bank of Italy and the Provincial Treasury Offices run by the Bank, they included 898 banks, 195 stockbrokers and a total of 87 stock jobbers and financial companies.

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- \*11) Small quantities of coin in the same denominations are struck by the Italian Mint for the Vatican City State; they are legal tender in Italy under international treaties. There is virtual monetary union with the Vatican State - as there is with the Republic of San Marino, though the latter does not have its own coinage - in that Italian coin and the notes of the Bank of Italy circulate freely there.
- \*12) In the case of 500-lire notes and coins of Lit. 500, 200, 100 and 50 the limit is 100 units; for the others it is 50 units.
- \*13) Both of these are essentially credit instruments to order, which are made out in the name of the payee, are payable at sight and issued against payment of the amount to the issuing bank at the time of issue.
- \*14) Institute for the Automation of Italian Savings Banks.
- \*15) Central Institute for Italian Savings Banks.
- \*16) A sample survey carried out in 1976 showed that 97 per cent. of all payments were in cash. This ratio is not expected to have fallen below 85 to 90 per cent. by the end of the 1980s.
- \*17) A survey carried out in 1976 showed that the top two hundred banks, classified on the basis of the volume of funds administered, had at least one computer, generally in the medium to high power range. Tele-processing systems had been or were being installed by 56 per cent. of these banks. It may be assumed that the proportion has risen appreciably since the survey was carried out; with few exceptions, practically all institutions in the financial sector now have electronic computers or make use of joint EDP centres and outside service bureaux. This widespread availability of computers is usually matched by a high level of automation varying, according to the type of operation, from 40-50 per cent. (medium and long-term loans, tax collection services) to 100 per cent. (current accounts, savings deposits, portfolio management).



6. J A P A N



## I. INTRODUCTION

In Japan the Government, businesses and individuals are now using various means of payment. It is difficult to estimate statistically the ratio between cash and non-cash means within the payment system of the nation as a whole, but it appears that individuals and households mainly use cash for purchasing goods and services and rely less on other means of payment. The Government and businesses, on the other hand, make very extensive use of cashless means of payment. In Japan the Government uses cheques and Treasury credits to a great extent for the payment of Treasury funds, and businesses also usually make large payments by means of cheques, bills, promissory notes and credit transfers.

Payments by the Government, businesses and individuals are facilitated by the wide range of methods for making and receiving payments offered by a large number of financial institutions, including banks and post offices. The development of electronics has led to a high degree of automation in the banks' payment systems, causing the spread of various forms of mechanisation, such as the automatic payment of cash, automatic cheque processing, electronic funds transfer, credit cards and the direct debiting of public utility charges. The establishment of a nationwide electronic funds transfer network linking together many financial institutions, namely the Data Telecommunications System of All Banks (the Zengin System), and the current development of an on-line system to handle the financial business of post offices throughout the country are indicative of future trends in the payments field.

The central bank as the sole note-issuing authority in Japan is responsible for the whole life cycle of bank-notes from issue to destruction. It also plays an extremely important rôle in Japan's payment system as the ultimate settlement organisation for the Government and for various financial institutions.

## II. CASH PAYMENTS

### 1. Historical basis

The present-day currency system in Japan was founded in 1882 with the establishment of the Bank of Japan. In 1885 the Bank began to issue convertible bank-notes under a double gold and silver standard and to withdraw various inconvertible notes from circulation. By 1897 economic progress had been such that Japan could adopt the gold standard. Two years later, in 1899, inconvertible notes ceased to be legal tender, so that the only bank-notes remaining in circulation were the gold-backed notes issued by the Bank of Japan.

Japan abandoned the gold standard as a result of the Great Depression that began in 1929. The Bank of Japan was thus released from the requirement to hold a specie reserve as backing for its bank-notes and adopted a managed currency system.

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### 2. Legal basis

As far as the issue of bank-notes is concerned, Japan applies flexible issue limits under the present managed currency system. That is to say, the bank-notes issued by the Bank of Japan have unlimited circulation for all transactions, both public and private (Article 29 of the Bank of Japan Law), and the maximum limit for the bank-note issue is fixed by the Minister of Finance upon the approval of the Cabinet (Article 30 of the same Law). The Bank of Japan is also required to maintain reserves equivalent to the value of bank-notes issued (Article 32). These reserves comprise gold and silver bullion, foreign exchange, SDRs, bills and notes, government bonds and obligations, advances to the Government and loans secured by securities and bills. As mentioned above, gold and silver bullion as well as foreign exchange are regarded merely as reserve items alongside bills, notes and government bonds, without being given special treatment as a specie reserve.

Coins are issued by the Government, which supplies the Bank of Japan with the quantities required for payments over its counters. The coins now in circulation were issued under the Temporary Currency Law of 1938, which stipulates that an amount up to twenty times a given denomination can be used as legal tender (e.g. up to Yen 2,000 in 100-yen coins).

### 3. Payment instruments

Cash now in circulation comprises notes issued by the Bank of Japan and coins issued by the Government. Bank-notes account for the bulk of the currency (94.6 per cent. in terms of value at the end of June 1979). At present there are nine denominations of bank-note: Yen 10,000, 5,000, 1,000, 500, 100, 50, 10, 5 and 1. The Bank of Japan has ceased to issue notes in denominations of Yen 100 or less but continues to accept them. The various denominations are issued in the following proportions: Yen 10,000 - 83.6 per cent.; Yen 5,000 - 4.3 per cent.; Yen 1,000 - 10.4 per cent.; Yen 500 - 1.4 per cent.; other denominations - 0.3 per cent.

Five denominations of coin are now in circulation, namely Yen 100, 50, 10, 5 and 1.

### 4. Users

Some of the bank-notes and coin in circulation are held by private financial institutions to meet demand for cash withdrawals from accounts. However, most of the funds drawn from the banks are used for the payment of wages and salaries, personal consumption and the settlement of businesses' smaller transactions. In recent years, cashless means of payment such as the automatic crediting of salaries and the use of credit cards have become popular, but in the household sector and among retailers the percentage of cases where cash is used as a payment instrument is exceedingly high.

Changes in the outstanding value of cash in circulation are influenced by consumers' cash holding propensity and society's practice of making cash transactions. These will not change drastically in a short period of time. An increase in personal income or consumption attributable to economic factors will boost demand for cash. Although slightly affected by financial conditions and the phase of the business cycle, the amount of cash issued in the last ten years has generally remained stable at 7-8 per cent. of nominal GNP.

5. The rôle of the central bank

The institutions involved in the cash system comprise the Bank of Japan and the Government as the issuing organisations, the Printing Bureau and the Mint Bureau of the Ministry of Finance as the production organisations and the private financial institutions providing intermediation between the issuers and the end users. As the sole bank of issue, the Bank of Japan is responsible for the whole life cycle of bank-notes including production, distribution, receipt, examination, sorting, destruction and replacement (Articles 35 and 36 of the Bank of Japan Law). The cycle is as follows:

Future cash requirements are forecast by the Cash Department of the Bank of Japan, which gives the production order to the Printing Bureau of the Ministry of Finance for bank-notes and to the Mint Bureau for coins. Newly produced bank-notes and coins are delivered to the head office and branches of the Bank, where they are kept in the vaults until required. When commercial banks need cash, the Bank of Japan supplies them with bank-notes and coins, which then pass into the hands of the general public. After changing hands many times, bank-notes flow back to financial institutions in the form of deposits, repayment of loans and tax payments. Commercial banks deposit surplus funds on hand with the head office or branches of the Bank of Japan.

Bank-notes received from financial institutions are examined for authenticity, condition, numbers and amount so that they may be sorted into reissuable and unreissuable notes. Unreissuable notes are destroyed by cancellation. The average life of bank-notes is slightly longer than two years for Yen 10,000 notes and a little less than one year for notes of Yen 5,000, 1,000 and 500. Coins returned to the head office and branches of the Bank are similarly sorted, unusable ones being withdrawn and sent to the Mint Bureau for melting down.

Damaged bank-notes are exchanged for new ones, provided the remnant presented is of a certain size. Hence, when two-thirds or more of the original note having both face and back remain, it can be exchanged at face value. When two-fifths or more remain, it can be exchanged at half the face value. Damaged coins are also exchanged at the head office or branches of the Bank of Japan. In this case, the value for which they are exchanged does not depend on their remaining size. They are exchanged for their full value or not at all, to be decided case by case.

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### 6. The level of automation

To cope with the expanding volume of cash in circulation the Bank of Japan has introduced many machines, including automatic bank-note examining machines, coin examining machines and coin counting machines. The automatic bank-note examining machines were developed jointly by the Bank of Japan and a machine manufacturer. Three kinds of machines, to handle all denominations, only 10,000-yen notes or only 1,000-yen notes, have been installed in the Bank so far. The multi-denominational machines, which have been in operation since August 1978, can be switched to examine one of three denominations (Yen 10,000, 5,000 and 1,000) with different dimensions and designs. These small machines have a large throughput and can examine the authenticity, condition and number of bank-notes at high speed by means of optical devices and electronic channels. The proportion of bank-notes examined by means of machines has increased rapidly in recent years and now accounts for 57 per cent. of the total.

Machines are also used to examine and count coins at the head office and branches. An examiner picks out counterfeit, defaced, invalid and damaged coins as the currency passes before him in two lines on the conveyor belt of the coin examining machine. The coin counting machine then calculates the number of coins and measures their diameter.

Private financial institutions have automated their handling of cash by installing cash dispensers, automatic depositors and automated teller machines. These machines will be explained in Section IV, "Hybrid payment systems". Many banks also employ cash arrangers, which are less costly than the machines used at the Bank of Japan but also rather inferior in their ability to examine the authenticity and condition of bank-notes.

In addition, coin-operated vending machines (for drinks and food, railway tickets, admission tickets, stamps, magazines, etc.) and change machines are to be found throughout the country.

## III. CASHLESS PAYMENTS

### 1. Historical basis

The modern banking system in Japan began with the establishment of national banks throughout the country from 1873 onwards. It is since that time that payments have been carried out by means of cheques, bills, promissory notes and credit transfers. The Japanese postal system was inaugurated in 1871 and postal savings, together with the postal money order, were introduced in 1875. Postal transfer accounts and postal cheque drawings through these accounts began in 1906 and 1948 respectively.

The first clearing house was set up in Osaka in 1879 and another in Tokyo in 1887 in response to the increasingly widespread use of cheques and bills. As the banks' involvement in these clearing houses

grew they found it rather burdensome to settle their clearing balances individually. From 1891 onwards, therefore, the Tokyo Clearing House settled the net clearing balances to be received or paid by means of transfers among the current accounts maintained with the Bank of Japan by each of the clearing banks. In this way the foundation of the current clearing system was laid.

The "domestic exchange" settlement system for carrying out credit transfers, remittances and collections when debtor and creditor lived in different areas entailed mutually settling the net exchange balances in accordance with the correspondent contract between financial institutions. In 1943, however, the collective settlement system was introduced whereby settlements are made collectively through the exchange settlement account opened at the Bank of Japan's head office or branches. This system has contributed greatly to streamlining exchange settlement among banks. In addition, the Data Telecommunications System of All Banks (the Zengin System), with which private financial institutions are compatible, was launched in 1973 to perform the message-switching function in "domestic exchanges".

## 2. Legal basis

The laws and regulations concerning the cashless payment system fall mainly into two categories, viz. general laws governing financial institutions and their activities and special laws and regulations concerning payments.

The Banking Law, which is the legal base of the Japanese financial system, can be regarded as the law defining financial institutions and their activities. Under this Law the business of ordinary banks is limited to such activities as accepting and paying deposits, granting loans, discounting bills and effecting exchange transactions as well as business relating to these banking operations. The Law thus makes specific provisions from the point of view of maintaining the credit system. Other laws defining the financial institutions' business are the Foreign Exchange Bank Law, Long-Term Credit Bank Law, Trust Business Law, Mutual Loan and Savings Bank Law and Credit Association Law.

As the business of the Post Office is under state control, the outline of its organisation and activities is laid down in the Establishment Law of the Ministry of Posts and Telecommunications. Stipulations regarding its business methods are also contained in the Postal Savings Act, the Cabinet Order, Ministerial Ordinance and internal regulations.

As far as cashless means of payment are concerned, the Law on Bills and the Law on Cheques lay down detailed provisions on the kind and nature of cheques and bills, how they should be drawn and endorsed and the general framework of cashless payment by these means. The procedure for the transmission of cheques and bills between financial institutions is based on the regulations of the clearing houses in each district. Credit transfers, credit cards and "domestic exchanges", which are means of cashless payment other than cheques and bills, are not covered by

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special laws. Such transactions are handled in accordance with either bilateral or multilateral agreements between the financial institutions or the institutions' general business rules.

### 3. Instruments

Cheques, bills and promissory notes, credit transfers, credits and "domestic exchanges" are used as cashless means of payment. Cheques are divided into government cheques, bank cheques and postal cheques. They are mostly used by public authorities and for payments between corporations; however, they are not widely used by the general public. It is rare for individuals or households to receive salaries or to purchase goods and services by means of cheques. Nevertheless, it is generally acknowledged that cheques are the most important of all the cashless payment means; in 1978 the volume of cheques handled in the clearing houses averaged Yen 2,500 billion per working day. Bills and promissory notes are used for payments in the business sector and are also eligible for discounting by financial institutions. The volume of bills and promissory notes cleared in 1978 showed an average of Yen 576.1 billion per working day, corresponding to 23 per cent. of the volume of cheques cleared.

Accounts held by clients with private financial institutions may be classified roughly into two groups, viz. demand accounts and time accounts. Cashless payments may be made through current accounts and ordinary accounts, both of which are demand accounts. A current account may be used to effect credit transfers and cheques may be drawn against it, but it bears no interest. An ordinary account bears interest and may be used for credit transfers but cheques may not be drawn against it. The use of credit transfers from current and ordinary accounts has become widespread but it is not possible to calculate the proportion of cashless payments effected by this means. It may be assumed to be very high, however, as the number of financial institutions that carry out large direct debits and effect credits automatically by batch processing on magnetic tape has been increasing in line with the growing computerisation of deposit business. A direct debit is used to make periodic and recurrent payments, i.e. public utility charges such as electricity, telephone, gas and water, as well as house rents, life insurance premiums and taxes. Automatic credits are widely used to pay salaries, annuities, dividends, interest, etc. With regard to the automatic payment of salaries, the survey conducted by the Dai-Ichi Kangyo Bank in mid-1978 reported that this instrument was used by most of its major corporate clients (397 out of 460 major corporations surveyed).

A "domestic exchange" is generally used as an instrument for out-of-town payments. This system is divided into two parts: the processing carried out between the offices of the same bank, and the transmission of a remittance to another bank. Exchange telecommunications between different banks are dealt with in a versatile manner nowadays through the Data Telecommunications System of All Banks (the Zengin System). Private financial institutions participating in the Zengin System number 708 banks and 18,032 business offices in all, and they use the system for sending remittances between different locations and payment instruments



involving corporations and households. In mid-1979 payments processed by the system averaged Yen 891.7 billion per working day. Since this amount comprises remittances by both credit transfer and by inpayment, it is impossible to calculate the total of credit transfers separately.

Post offices handle postal savings in the same way as savings institutions; however, since postal savings accounts are intended exclusively for savings and hence bear interest, they may not be used for making cashless payments such as drawing cheques and effecting credit transfers. To compensate for this inconvenience, the Post Office introduced non-interest-bearing postal transfer accounts on which postal cheques and credit transfers could be drawn to effect nationwide remittances and payments. In the 1978 fiscal year the average of receipts and payments through postal transfer accounts came to Yen 38.2 billion per working day.

#### 4. Suppliers of the service

The organisations running cashless payment systems in Japan are mainly the Bank of Japan, private financial institutions and the Post Office. It should not be overlooked, however, that clearing houses and the Zengin System supplement the rôle of these financial institutions. The cashless payment service which the Bank of Japan performs for the Government and the financial institutions is explained in the Section 5. on "The rôle of the central bank".

Japan's private financial institutions comprise city banks (totalling 13 banks with 2,623 branches at the end of 1978) and regional banks (63 banks with 5,399 branches), both of which deal mainly with short-term financing, long-term credit banks (3 banks with 50 branches) and trust banks (7 banks with 300 branches) providing mainly long-term financing, together with mutual loan and savings banks (71 banks with 3,574 branches) and credit associations (466 associations with 5,231 branches), whose clients are mostly individuals and small enterprises. The financial institutions with a large share in the cashless payment system are the city banks and the regional banks, both of which have fairly extensive branch networks and are highly computerised. The demand deposits held by city and regional banks account for approximately 70 per cent. of the total administered by all private financial institutions.

There are 172 clearing houses, which clear cheques and bills on a regional basis. In regions where the Bank of Japan has no branch, banks select a representative bank and hold accounts with that bank in order to clear balances arising from transactions among themselves.

The Zengin System dealing with the clearing of "domestic exchanges" between different financial institutions forms a nationwide remittance network constructed around the computer centre run by the Bankers' Association of Tokyo. The Nippon Telegraph and Telephone Public Corporation provides private lines and also takes responsibility for maintaining the whole system.

## Japan

The Post Office, which has a nationwide network of about 22,000 offices, held postal savings amounting to Yen 41,300 billion at the end of September 1978, or 15.3 per cent. of total deposits and savings held by the major financial institutions. As it is not possible to draw cheques on these postal savings accounts or effect credit transfers through them and as most business regarding postal transfer accounts capable of providing cashless payment services has not yet moved over to mechanical processing, the importance of the Post Office in cashless payment systems is considered still to be comparatively small.

### 5. The rôle of the central bank

The Bank of Japan, as the ultimate settlement organisation, provides various cashless payment services for client financial institutions and handles Treasury payments and receipts by cashless means. In other words, financial institutions which hold current accounts with the head office and branches of the Bank (34 offices in all) are able to make payments or settlements by drawing cheques on the Bank of Japan. The Bank conducts payments, remittances and settlements among client financial institutions by means of bank-to-bank transfers in their current accounts with the Bank. In this way the Bank effects remittances and credit transfers between offices in various localities of client financial institutions, or between those of other financial institutions. The net credit or debit balance resulting from the clearing of cheques and bills is also collectively settled by means of transfers among the current accounts opened at the Bank of Japan's head office or branches. Similarly, the domestic exchange net balance from the Zengin System is settled through the settlement account with the Bank.

The Government maintains an account with the Bank on which it draws by cheques. Treasury payments through the Government account - the payment of social security benefits, for example - may also be sent on magnetic tape to the various financial institutions, which credit the amounts to the recipients' accounts by batch-processing. The total of social security benefits automatically paid to recipients' accounts amounted to about Yen 1,300 billion in 1978, or 60 per cent. of the total disbursed.

### 6. The level of automation

The Bank of Japan has computerised the processing of most of its main transactions, such as deposits, interbank remittances, loans and discounts at head office where the volume of business handled is greatest. Private financial institutions use computers to a large extent for processing their most important business. According to one survey conducted at the end of 1978, the proportion of offices which carried out on-line processing of current and ordinary accounts most closely related to cashless payments was calculated to be 100 per cent. for city banks, 94 per cent. for regional banks, 86 per cent. for mutual loan and savings banks and 73 per cent. for credit associations.

The Tokyo Clearing House, which handled 60 per cent. of the total value of cheques and bills cleared in 1978, has also automated its operations. Cheques and bills on which the details are recorded in magnetic ink can be presented before the clearing day for automatic sorting and calculation of the clearing balances. On the morning of clearing day the sorted cheques and bills are delivered to the drawn banks, which feed them to their sorter-readers to record the drawers' names and the amount on magnetic tape; the necessary debit entries are then made by batch-processing in the clients' accounts held in the on-line deposit file.

The Zengin System provides participating banks with a nationwide on-line network over which they can effect remittances, transfers and collections. Any request from a bank branch for a remittance or money transfer to be made is automatically forwarded by the sending bank's central computer to the central computers of the Zengin System. A paying bank's central computer receiving advice of such a transaction through the System updates the deposits files automatically and sends an exchange advice to the paying office. The primary purpose of the Zengin System is to calculate automatically the exchange balances of the participating banks; however, it can also give and receive messages, make error checks and maintain the confidentiality of information.

The post offices handle remittances, transfers and collections of funds as well as the receipt and payment of postal savings. Most of these operations are carried out manually, in sharp contrast to the highly sophisticated computers used in private financial institutions. Several years ago the Ministry of Posts and Telecommunications therefore decided to completely automate the post offices' financial business and has gradually introduced innovations with a view to achieving full computerisation by 1984. For this purpose the Ministry plans to create nine post office regions and to set up a computer centre in each. The network will thus be nationwide and various transactions will gradually be automated. The on-line processing of deposits and withdrawals on postal savings accounts was launched in August 1978 in a number of districts including the Tokyo Metropolitan area. About 3,000 post offices in the Tokyo, Osaka and Nagoya areas will be connected up for such transactions by the end of March 1980. When the whole plan has been realised, the largest on-line network for a single financial institution in Japan will have been formed. The receipt and payment of deposits, interest calculations, fund transfers and collections can then be processed instantaneously at the counter in every post office. The post offices will also be able to offer other cash and cashless services, including the use of cash dispensers, automatic depositors, the direct debiting of public utility charges, the automatic crediting of salaries, etc.

#### IV. HYBRID PAYMENTS

The cash dispenser (CD) service operated by private financial institutions was inaugurated at the end of 1969 on the basis of off-line processing. However, with the development of the on-line processing of account transactions, on-line CDs began to spread quite rapidly from

## Japan

about 1971 onwards. By the end of January 1979 332 private financial institutions had installed 11,620 CDs and issued a total of 37 million CD cards. In the case of city banks, which are responsible for nearly half the total number of CDs installed and CD cards issued, CDs at present handle an average of 120 withdrawals a day, which compares well with one teller's daily handling capacity. Probably more than 50 per cent. of cash withdrawals are effected via CDs. When CDs had been installed in most bank branches, they began to be introduced in public locations such as department stores, stations and hospitals. The banks therefore agreed to operate CDs jointly in public locations away from bank premises and the Nippon Cash Service Co. Ltd. was set up to manage the machines for this purpose. Fifty-four major banks currently hold shares in this company and are jointly utilising 214 CDs for on-line processing. In addition, the possibility of operating CDs jointly on bank premises as well has recently been studied.

Automatic depositors (ADs) based on on-line processing were introduced by some financial institutions from the middle of 1973 onwards; by the end of January 1979 482 devices had been installed throughout the country. Automated teller machines (ATMs), with the functions of both CDs and ADs, were first introduced in 1978; by mid-1979 the number installed had reached 105.

Credit cards with nationwide validity are issued by seven leading companies. The number of credit cards issued at the end of 1977 amounted to about 8 million and sales effected by means of credit cards averaged about Yen 50 billion per month in 1977. Payment for purchases made using such cards is effected by means of credit transfers between financial institutions.

7. NETHERLANDS



I. GENERAL INTRODUCTION

The payment system in the Netherlands is essentially based on three instruments, namely cash, guaranteed cheques and transfers.

Cash payments are effected mainly by means of bank-notes. At the end of 1978 about 290 million bank-notes were in circulation, representing a total value of Fl. 18.7 billion (US\$ 9.5 billion). Under Netherlands law, the production and issue of these bank-notes is the exclusive domain of the Netherlands Bank. The coins in circulation in the Netherlands are produced by the Mint. At the end of 1978 some 4,931 million coins were in circulation, their total value amounting to Fl. 1 billion (\$0.5 billion). No data are available concerning the number of cash payments.

Guaranteed cheques began to gain ground around 1968. In 1978 over 95 million guaranteed cheques were processed by the banks and about 138 million by the giro institutions.

It is estimated that in 1978 over 1 billion purely giro transactions were effected through the banks' circuit, the postal circuit and the circuit of the Municipal Giro Service of Amsterdam.

At the end of 1978 the total currency circulation - excluding notes and coin at banks - was worth the equivalent of \$9.5 billion, while the value of demand and time deposits amounted to the equivalent of \$20.9 billion and \$63.5 billion respectively. The per capita figures were \$679 for currency, \$1,493 for demand deposits and \$4,536 for time deposits.

In the Netherlands, which has a surface area of 36,948 square kilometres and 14 million inhabitants, some sixty-five universal banks, five banks organised on a co-operative basis, some twenty security credit institutions and more than eighty savings banks are active. Together, these institutions operate 5,753 branch offices, i.e. one office for every 2,434 inhabitants. Practically all these offices participate fully in the banks' giro system. In addition to the banks, there are the Postal Cheque and Giro Services, with a total of 2,727 offices, i.e. one office for every 5,134 inhabitants.

II. CASH PAYMENTS

1. Historical basis

Ever since coins came into widespread use in the area now covered by the Netherlands, there has been a need for central regulation of the currency system. In the past, such regulation was achieved only at times of strong central authority.

The text of the Union of Utrecht of 23rd January 1579, which is regarded as the founding act of the Netherlands State, includes

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provisions (in Article 12) regarding the currency system within the area of the Union. This does not mean, however, that a sound centralised currency system was actually established at that time. Although the unity of currency was laid down in the State Regulation of 1798, it was not until the entry into force of the Coinage Act of 1816, which also introduced the decimal system for coins, that the fragmented situation came to an end. The Act provided for gold coins of 10 guilders and 5 guilders, silver coins of 3 guilders, 1 guilder, 1/2 guilder, 25 cents, 10 cents and 5 cents, and copper coins of 1 cent and 1/2 cent. In addition, the use of the gold ducat as a commercial coin continued to be allowed. The Coinage Act of 1816 remained in force until 1948.

The first attempt to issue bank-notes was made in 1798 by the Generale Bank van Belening. The attempt failed and that institution was liquidated in 1802. Subsequently, the issue of bank-notes was undertaken by the Netherlands Bank, which issued its first note on 5th April 1814. The average circulation of the bank-notes issued during the first years of this institution was around Fl. 1.2 million. For many years the Netherlands public continued to view bank-notes as a substitute for the customary coins. The issue of bank-notes was not actually centralised until the Bank Act of 1863, which granted the monopoly of issue to the Netherlands Bank, now the country's central bank.

### 2. Legal basis

The present system of cash payments in the Netherlands is based on two Acts, viz. the Coinage Act of 1948 for coins and the Bank Act of 1948 for bank-notes.

The Coinage Act provides that the guilder, the unit of account of the Netherlands currency system, is divided into 100 cents. Under the Act, the following coins were, or are, brought into circulation as legal tender (within certain ceilings):

- silver: 10 guilders, 2 1/2 guilders and 1 guilder;
- nickel: 2 1/2 guilders, 1 guilder, 25 cents and 10 cents;
- bronze: 5 cents and 1 cent.

In addition, anyone may have gold ducats minted, although they are not legal tender. All coins are produced by the Mint, an institution under the supervision of the Ministry of Finance.

The Bank Act of 1948 provides that the Netherlands Bank has the sole right to issue bank-notes. These bank-notes are legal tender. The Netherlands Bank is not allowed to issue bank-notes having a face value of less than five guilders.

### 3. Payment instruments

At the end of 1978 the currency in circulation in the Netherlands consisted of:



- bank-notes in five denominations ranging from Fl. 5 to Fl. 1,000;
- coins in seven denominations ranging from Fl. 0.01 to Fl. 10.

The value of the bank-notes in circulation at that date totalled Fl. 18.7 billion (\$9.5 billion); the coins in circulation had a total value of Fl. 1.0 billion (\$0.5 billion). During the year the value of the bank-note circulation fluctuated between Fl. 16.6 billion (\$8.4 billion) and Fl. 19.0 billion (\$9.6 billion).

Between the end of 1977 and the end of 1978, the currency circulation increased by 7.6 per cent. Fl. 100 bank-notes accounted for 56.37 per cent. and Fl. 1,000 notes for 25.37 per cent. of the total currency circulation at the end of 1978. The proportion of the total accounted for by coins was less than 6 per cent. Viewed over the years, the volume of currency in circulation shows a distinct wave pattern, with peaks in the summer months and in December. Within each month, there is generally a low in the third week.

#### 4. Bodies managing the currency

Coins in denominations of less than Fl. 1 are brought into circulation by the Post Office. Bank-notes and coins in denominations of Fl. 1 or more are brought into circulation through the central bank's giro circuit, by the banks, post offices and some large enterprises. The often substantial amounts taken up by these institutions are debited to their current accounts with the central bank. The public in turn takes up the notes and coins from the institutions concerned so as to meet normal household expenditure; these withdrawals are debited to their accounts, to which in most cases their salaries are credited every month. In the system use is made of the network of bank branch offices and post offices all over the country. The central bank itself uses sixteen establishments throughout the country to realise this distribution.

Cash no longer needed by the banks and post offices is returned to the central bank or to one of its agencies and is credited to the current account of the institution concerned. Bank-notes returned to the central bank in this way are counted, checked to detect counterfeits and sorted into clean and soiled notes; all these operations are combined in one automated process. The stock of notes and coins held by the banks and giro institutions fluctuates between 3 and 7 per cent. of the currency circulation. At the end of 1978 the figure was 4.3 per cent., which represented an amount of about Fl. 860 million (\$437 million).

#### 5. Users

Cash payments are mainly used for day-to-day household purchases in the personal sector. However, the larger the amount involved, the more giro transfers or payments by means of guaranteed cheques tend to be used. Giro transfers predominate in the case of rent, insurance premiums, gas, water, electricity, subscriptions, etc.

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Although no exact figures are available, it may be stated that the use of cash to pay wages, salaries, pensions and social insurance benefits is becoming rare, as virtually all such payments are now effected by giro. Cash payments do, however, still occur in cattle trading and in second-hand car deals, as well as in cases where taxation can thereby be evaded.

The use of guaranteed cheques for larger items of household expenditure has resulted in a further decrease in the share of cash in the money supply of the Netherlands.

### 6. Rôle played by the central bank

As already noted in Section II.2, the Bank Act of 1948 makes the Netherlands Bank responsible for the currency circulation in the Netherlands. Bank-notes are put into circulation by meeting the demand from banks and giro institutions which hold current accounts at the central bank (see Section II.4). As, on the one hand, banks will tend to keep any debit balance at the Netherlands Bank as small as possible (since they must pay interest on such balances) and, on the other hand, will attempt to invest their unneeded cash so as to earn maximum interest (the central bank does not pay any interest), they minimise their stock of bank-notes and return any unneeded notes to the Netherlands Bank.

In 1978 a total of Fl. 40.2 billion (\$20.4 billion) of bank-notes was taken up by banks and a total of Fl. 38.9 billion (\$19.8 billion) was returned.

The bank-note circulation is subject to a royal decree to regulate the so-called reserve ratio; this decree provides that at least 50 per cent. of the circulation, consisting of the bank-notes in circulation plus third-party deposits held at the Netherlands Bank, must be covered by gold, convertible currency holdings and net claims on the IMF. The bank-notes returned from circulation are handed in at the Netherlands Bank's head office or its agencies in the various provinces. The returned notes are processed centrally at the Bank's head office (see Section II.4).

### 7. Level of automation

Automation of the use of notes and coins in the Netherlands is still at an early stage; this is not surprising in view of the major proportions which giro payments have assumed there. A number of cash dispensers are in operation, but they have so far not been very intensively used. Larger-scale use is made of automated points of sale for certain articles, such as public transport tickets and confectionery. These machines are operated by the insertion of coins and may be combined with money changers. The automatic counting and sorting of coins is well established.

The Netherlands Bank operates an integrated and fully automated bank-note sorting process, in which soiled notes and counterfeits are

sorted out, the notes are counted and their numbers registered. The machines used in this process are each equipped with a device to produce magnetic tapes for the large file registration system which is kept on the Bank's central computer. In 1978 about 500 million notes were processed by these machines.

### III. CASHLESS PAYMENTS

#### 1. Historical basis

The earliest attempts to create a giro transfer system in the Netherlands date from the 17th century. In Amsterdam there was, for example, the Amsterdamsche Wisselbank (1609-1819). Modelled on the Italian banks, this institution provided a true giro service; subject to a certain ceiling, the deposits were guaranteed by the City of Amsterdam. At that time, similar institutions also existed elsewhere in the country.

Towards the end of the 19th century, a giro system for payments by trade and industry was provided by the universal banks. To handle small-scale giro payments, the Postal Cheque and Giro Services (Postcheque en Girodienst) were set up in 1918 under the auspices of the Post Office. The regulations governing this service were laid down in the Giro Decree of 1917.

The Municipal Giro Service of Amsterdam (Girodienst van de Gemeente Amsterdam), an institution for local users, was opened to the public in 1918. In 1979 this institution merged with the Postal Cheque and Giro Services.

Until the 1960s the banks did not play a significant rôle in small-scale payment transactions. The situation until that time was that the banks handled payments for, and lending to, enterprises and institutions, whereas the giro institutions handled the payment transactions of practically all individuals. This market division changed when the banks started campaigning to promote the use of private accounts by the public at large. In doing so, the banks were prompted by their need for additional deposits to enable them to expand their lending operations and improve their liquidity. Mechanisation and automation had advanced sufficiently to permit the processing of the large numbers of payment orders resulting from such accounts.

To ensure easy and rapid interbank transfers, the Banks' Clearing Institution (Bankgirocentrale) was set up in 1967. This institution is used by the universal banks, the savings banks and the banks organised on a co-operative basis.

In 1975, under the chairmanship of the President of the Netherlands Bank, consultations were started between the banks, the Postal Cheque and Giro Services and the central bank with a view to examining the possibilities of establishing a national payments circuit.

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### 2. Legal basis

As regards giro payments, no general legislation is in force in the Netherlands. Regulations are contained in the Postal Giro Decree of 1966 (revised) and in the General Terms and Conditions of the Netherlands Bankers' Association of 1971. Otherwise, the normal civil and commercial laws apply. This means that no one is under an obligation to accept cashless payment of claims, since only coins and bank-notes are legal tender. However, the legal view that has evolved over the years is that anyone who makes public (or causes to be made public) the fact that he holds an account is regarded as having given prior consent to payments into and/or transfers to that account, which he cannot therefore reasonably refuse. It is planned to include a provision in the new Civil Code to the effect that a giro payment is equivalent in law to payment with coins or bank-notes. Under the present regulations, these types of payments can only be equated in times of war or other exceptional circumstances pursuant to the Financial Transactions Emergency Act.

### 3. Payment instruments

In the Netherlands giro system, the following payment instruments may be distinguished:

- normal transfers;
- prepared transfers;
- direct debits;
- cheques;
- other payment instruments.

Normal transfers predominate in the Netherlands giro circuits. Practically all non-periodic payments in trade and industry, as well as part of household payments, are effected by means of transfers. This payment instrument is also used on a large scale by the central government and local authorities.

When making a giro transfer, the account-holder instructs his giro service (bank or giro institution) to debit his account with the amount indicated in his transfer order, and to credit that amount to another account, likewise indicated by him, at a bank or giro institution.

Prepared transfers fall into two categories, the periodic transfer and the inpayment transfer.

In the case of the periodic transfer, the account-holder gives his giro service a standing order to transfer, at fixed dates, fixed amounts to an account indicated by him. This form of payment is frequently used for rent, subscriptions, insurance premiums, etc. On the fixed dates the giro service effects the transfer, without any action on the part of the account-holder being required.

The second form of prepared transfer, the inpayment transfer, is initiated by the creditor. Together with his bill, he sends the debtor a fully prepared transfer form which need only be signed by the latter. In

the majority of cases the creditor also fills in the debtor's account number, which he knows from previous payments. All the debtor has to do is to sign the form and send it to his giro service. This manner of payment is used for both periodic and non-periodic payments of either fixed or varying amounts, e.g. for telephone bills, insurance premiums, subscriptions as well as for bills for deliveries to regular customers.

Direct debits constitute a separate category, even though they have much in common with inpayment transfers. The direct debit is also initiated by the creditor, who is authorised beforehand by the debtor to charge his account for goods delivered or services performed, without any action on the debtor's part being required. This procedure is frequently used by public utilities among others.

In 1978 an estimated 1 billion transfers were handled by the two large national giro circuits; of this total, about 45 per cent. was accounted for by the banks' giro system and 55 per cent. by the giro institutions.

In the past, the cheque never played a major rôle as a domestic payment instrument in the Netherlands. This was due to the fact that a satisfactory giro transfer system had been available to the public from an early date.

In the second half of the 1960s, however, guaranteed cheques were introduced. The first (1967) was the guaranteed bank card cheque issued by the banks for domestic use, and the second (1969) the guaranteed giro card cheque of the Postal Cheque and Giro Services; the eurocheque was introduced in 1973. The guaranteed bank card cheque and the guaranteed giro card cheque are guaranteed by the issuing institutions for up to Fl. 100 and Fl. 200 respectively; they are made available to account-holders on request and free of charge. The eurocheque is guaranteed up to an amount of Fl. 300; an account-holder using eurocheques pays Fl. 10 per year to cover insurance for the consequences of loss or theft of the cheques.

These three payment instruments can only be used in conjunction with a cheque card showing 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 card cheque and the eurocheque can be used in a number of other countries for cash withdrawals (both) or purchases (eurocheques only).

In 1978 the number of guaranteed cheques used domestically was 95 million for the banking sector and 138 million for the giro institutions.

Of the total of payment orders in the giro circuits, over 20 per cent. are accounted for by guaranteed cheques, 12 per cent. by direct debits and about 20 per cent. by inpayment transfers. The shares of normal and periodic transfers are not known.

Other payment instruments, such as credit cards, play an insignificant rôle.

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### 4. Types of giro services and bodies by which they are managed

In 1978 four giro circuits were in operation in the Netherlands, viz.:

- (a) the banks' circuit;
- (b) the postal circuit;
- (c) the circuit of the Municipal Giro Service of Amsterdam;
- (d) the circuit of the Netherlands Bank.

The importance of these circuits is shown in the following table:

	Banks	Postal Cheque and Giro Services	Municipal Giro Service of Amsterdam	Netherlands Bank
<u>1978</u>				
Purely giro items handled, in millions of items	460	ca.	580	1
Transfers, in billions of guilders	450		400*	2,239
<u>End-1978</u>				
Number of accounts, in thousands	7,145		4,320	1
Total balance on accounts, in mil- lions of guilders	26,769		14,665	3,323

\* Estimate.

The Postal Cheque and Giro Services are characterised by a high degree of centralisation. The Services operate two central offices where all giro orders are processed. As stated above, the Municipal Giro Service of Amsterdam recently merged with the Postal Cheque and Giro Services.

The banks' circuit is basically a decentralised system. In 1967 the banks, each of which is fully independent, founded the Banks' Clearing Institution to facilitate payments among the banks themselves and between the banks and the giro institutions by means of the centralised processing of transfer orders. The transfer orders received by the branch offices of the banks are converted into machine-readable data carriers, nowadays practically all in the form of magnetic tapes. The data carriers are sent to the Banks' Clearing Institution, where the in-

formation is processed in such a manner that for each individual bank a machine-readable data carrier is obtained, containing all credits to accounts of that particular bank's clients.

It should be noted that the Banks' Clearing Institution is merely an intermediary between the participating banks. It receives debit items and converts them into credit items, for individual banks and account numbers, by means of an automated system.

The Banks' Clearing Institution does not know the balances on accounts, makes no entries in accounts and, consequently, does not 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 statement of account, which they send to their clients unaccompanied by any enclosures.

It is clear that these purely technical operations of the Banks' Clearing Institution must be followed by financial settlement. For this purpose the participating banks have authorised the Banks' Clearing Institution to effect a daily clearing through the Netherlands Bank, the account of each bank being debited or credited for the difference between its total debit and credit items.

Since all universal banks, banks organised on a co-operative basis and savings banks make their mutual transfers in this manner, the Banks' Clearing Institution represents the heart of a national bank giro circuit.

The two giro systems in the Netherlands, which are important to the public at large, are seen by this public as being highly centralised. The way in which the Banks' Clearing Institution functions, which as noted above results in a daily clearing operation at the central bank, causes the public to view the banks' giro system as an integrated entity.

Transfers between the postal giro circuit and the banks' giro circuit tend to be relatively slow. This is due to the fact that, although the banks hold accounts with the Postal Cheque and Giro Services, the latter does not hold any accounts with the banks.

The circuit of the Netherlands Bank embraces only a limited circle of account-holders, mainly banks, money and capital-market institutions and public authorities. The system is highly centralised and completes all transfer orders on the day of receipt. The statements of account are in the possession of the participants on the next day.

##### 5. Rôle played by the central bank

The rôle played by the central bank in the giro systems in operation in the Netherlands is described in Section III.4.

In addition to serving as a clearing institution as set out in that section, the central bank acts as cashier to the central government.

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The transfers effected by the central bank in that capacity totalled Fl. 150 billion (\$ 76.2 billion) in 1978.

Acting on the basis of, among other things, Section 9 of the Bank Act of 1948, which provides that the Bank shall facilitate domestic money transfers, the Minister of Finance has invited the Bank's President to chair a steering committee for the integration of the giro systems. This committee, which was set up in 1975, is now working on a preliminary design for one single national giro network in which the banks and the Postal Cheque and Giro Services may take part on an equal footing, whilst retaining their own identity. The committee's investigations centre on the design of a model to integrate the existing circuits, to be characterised by a large measure of decentralised processing of payment orders and optimum use of data communication equipment.

### 6. Level of automation

At the Postal Cheque and Giro Services, the entire giro processing system has been fully computerised in two centres. Users very frequently present their orders for transfers or direct debits in the form of magnetic tapes. Private account-holders send their payment orders to one of the two centres, using punched cards. The Postal Cheque and Giro Services are gradually replacing these punched cards by machine-readable forms.

The banks' giro system is marked by greater diversity as regards the level of automation, which varies with each individual bank. The system of the Banks' Clearing Institution is fully computerised and is operated in two centres. The Institution receives the information from the banks practically entirely in the form of machine-readable data carriers. The guaranteed bank card cheques and eurocheques are also processed automatically by the Banks' Clearing Institution. These cheques are retained by the Institution, in the same way as the corresponding guaranteed giro card cheques at the Postal Cheque and Giro Services. As far as is known, this is the only form of cheque truncation in the Netherlands.

The giro circuit of the Netherlands Bank is also fully computerised. In 1979 terminals were installed at the offices of the principal account-holders to enable them to feed giro transfer orders directly into the system.



8. S W E D E N



## I. GENERAL INTRODUCTION

The institutional environment within which the transfer of funds takes place can be said to have two main components - the banking sector and the Post Office.

The banking sector comprises fourteen commercial banks, some two hundred savings banks and twelve co-operative banks. A wide variety of funds transfers are effected by these banks through their more than 3,800 branches.

The banks' participation in the payment system, as it has evolved over the years, is to a large extent characterised by co-operation rather than competition. Cheque or bank giro transactions will be handled by any bank branch, irrespective of the issuing bank. All the Swedish banks without exception participate in the bank giro system, i.e. the system for transferring funds from one bank account to another. In the more novel area of automated cash dispensers, there are, however, two totally separate systems, although negotiations are already going on with a view to linking up the two systems.

Although the Post Office has since 1974 engaged in very few banking activities in its own right, its rôle in the payment system is more important than that of the banks. Cash, cashless or semi-cashless funds transfers are made through the more than 2,300 post offices and 2,700 rural postmen or directly through the postal giro system.

The Postal Giro co-operates closely with one of the commercial banks, the government-owned PK-Bank, and also offers certain services to the other banks, such as cashing cheques and paying out sums withdrawn from savings banks. As there are no direct links between the bank and the postal giro systems, the question of whether their connection would increase the efficiency of the Swedish payment system has been widely discussed. In the spring of 1979 a government commission that had been instructed to examine the question published a number of proposals for the establishment of some form of co-operation between the two giro systems. No decision has so far been taken, however.

The development of the payment system in Sweden has not been governed by any specific legislation. With the exception of the circulation of notes and coin, the central bank has not sought to influence its development. Even as the body responsible for final settlement between the banks, the central bank has played a rather passive rôle.

## II. CASH PAYMENTS

### 1. Historical basis

The first Swedish bank started to issue bank-notes as early as 1661. For a few years those notes were received very favourably by the

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general public, but as a result of excessive issuing confidence in the notes was undermined and the bank failed. The bank was then taken over by Parliament and became the Bank of Sweden in 1668. The issuing of bank-notes was forbidden for a long time, but the Bank of Sweden nonetheless soon started to issue a special kind of transferable debt certificate that acted as a substitute for notes.

In the early 1830s the first private banks were established and in the middle of the century they were allowed to issue bank-notes. In 1903, however, the Bank of Sweden was given the note-issuing monopoly.

The issuing of coins has always been a prerogative of the central government. For a very long time the Swedish coinage was copper-based and the coins were extremely large and heavy.

### 2. Legal basis

The provision of legal-tender notes and coins in Sweden is the exclusive responsibility of the central bank and the central government respectively.

In the new Swedish constitution adopted in 1974 it is stated that the Bank of Sweden is an agency of Parliament and that the Bank has the sole right to issue notes. Until recently the Bank's note-issuing right was restricted by a note issue ceiling, but the ceiling was abolished by virtue of an amendment to the Bank of Sweden Act which came into effect on 1st January 1975. The Act still contains a note-cover regulation, however; in its twelfth section it states that the amount of notes outstanding has to be covered by gold and short-term foreign exchange claims, government securities and claims on banks.

The bank-note denominations that the Bank of Sweden is entitled and required to issue are specified in the Bank of Sweden Act. At present the Bank is required to issue S.kr. 5, 10, 50, 100 and 1,000 notes. It may, if it deems appropriate, issue S.kr. 1 and S.kr. 10,000 notes. The Bank has also proposed the introduction of a S.kr. 500 note but no decision has so far been taken, as any change in denominations requires Parliament's approval.

By virtue of the Coin Act, the sole right to issue coins is vested in the central government. The basic currency unit is 1 krona, which equals 100 öre. The denominations of coins that the central government is required to issue are currently S.kr. 5 and 1 and 50, 25, 10 and 5 öre. Until a few years ago 2 and 1 öre coins were also issued, but since 1st July 1972 these two coins have no longer been legal tender. This means that all payments have to be rounded to the nearest 5 öre.

In addition to the coins mentioned above, S.kr. 2 coins still constitute legal tender, although none have been issued since 1971. Commemorative coins in denominations of S.kr. 10 and S.kr. 50 are also regularly issued.

3. Instruments

At present legal-tender notes and coins are issued in the following denominations:

Notes: S.kr. 5, 10, 50, 100, 1,000 and 10,000

Coins: 5, 10, 25 and 50 öre, S.kr. 1 and 5

Details of the value of the notes of the various denominations in circulation at the end of 1978 are given below.

<u>Denominations</u>	<u>Amount in thousands of kronor</u>
10,000	515,870
1,000	9,242,749
100	15,729,758
50	799,203
10	1,174,418
5	284,747
1*	669

\* The S.kr. 1 note was only issued between 1914 and 1921 and is now a "collectors' item".

At the end of 1978 the value of notes and coins in circulation totalled S.kr. 29,174 million, representing an increase of 13.3 per cent. over the end of 1977. In the last ten years the volume of currency in circulation has grown at an annual rate of about 9 per cent. The ratio to GNP has diminished only slightly during the last twenty years, amounting to about 7 per cent. at the end of 1978.

4. Institutions managing the currency

Notes and coin are put into circulation by the central bank via the banks and the Post Office. Although the production of coins is a central-government responsibility, they are put into circulation in the same way as notes, as the central bank purchases the whole coin production. The banks and the Post Office receive cash from the Bank of Sweden's head office and its twenty-three branches.

5. Users

Industrial and commercial companies, public agencies, and local and central-government authorities have virtually ceased making out-payments in cash. Almost all wages and salaries are now paid directly into bank accounts. The bulk of cash payments would therefore seem to involve individuals' payments for goods and services. However, the

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importance of notes and coins does not seem to have diminished in spite of the increasing use of other means of payment such as cheques, credit cards or giro facilities. There are not, however, any statistics, not even estimates, available on the turnover of cash for payments. The only way to get some idea of its relative importance is to look at the amount outstanding. This has hardly diminished in relation to total production or private consumption. A plausible explanation for this phenomenon is that in an increasingly complex society the number of payment transactions for a given GNP has increased. In a complete barter economy, no notes are needed at all, irrespective of the level of GNP.

### 6. Rôle played by the central bank

As the central bank has the sole right to issue notes, it also implicitly has the responsibility to provide the economy with enough bank-notes in the denominations required. As mentioned earlier, the central bank also handles the coin circulation.

New notes are printed at the Note Printing Company, a company wholly owned by the central bank. New coins are minted at the Royal Mint, but the entire output is purchased by the central bank.

Notes and coins returned by the banks and the Post Office are counted by the Note Counting Department at the central bank and by the branches. All notes are checked to detect counterfeits. Damaged and dirty notes are set aside and are sent to a special office at the central bank where they are destroyed.

### 7. Level of automation

The volume of notes handled has expanded steadily. In 1978 about 200 million bank-notes were taken in, counted and sorted at the central bank, compared with about 130 million ten years earlier. In view of this steady expansion, the Bank of Sweden has installed semi-automatic note-counting machines. At present the Note Counting Department possesses six machines.

A commission is currently investigating a second step, which will possibly include some kind of automatic processing even at the branches.

## III. CASHLESS PAYMENTS

### 1. Historical basis

In Sweden cashless payments can be effected via two different giro systems, the Postal Giro and the Bank Giro.

The Postal Giro was introduced in 1925 and from the very beginning it operated nationwide. The Postal Giro at first mainly served the public

sector and firms, but it grew very rapidly and today serves a wide range of customers. In fact, almost every Swedish firm, organisation, local and central authority has a postal giro account. While the number of individuals with such an account is limited, there are also salary accounts at the PK-Bank which are linked with the Postal Giro and, in all, about 1.5 million accounts held by individuals offer giro facilities.

Cheques and cashiers' cheques for a long time constituted the usual means of payment via banks. Transfers between bank accounts first became possible in the 1950s when the Bank Giro was introduced. The Bank Giro initially concentrated predominantly on the business sector but in the last few years other groups of customers - to a limited extent individuals, too - have assumed greater importance.

## 2. Legal basis

From its inception until the end of June 1974 the Postal Giro was administered by the Postal Savings Bank, forming the Post Office Bank which was a separate division within the Post Office. In 1974 the Post Office Bank was dissolved and the Postal Savings Bank merged with a government-owned commercial bank (the PK-Bank), while the Postal Giro became a central unit of its own within the Post Office.

The activity of the Postal Giro was regulated by law until the end of 1969. Between 1970 and 1974 the Board of the Post Office Bank was empowered to regulate its activity as and when necessary.

As the Post Office co-operates very closely with the PK-Bank with respect to payment transactions, its services to this bank have since 1974 been regulated in a contract between the two parties. The contract expires at the end of 1979 and will be extended for another two years if neither party cancels it.

The Bank Giro, in which all banks participate, is a consortium which every year appoints its own board. The Bank Giro is not a legal entity. It may be described as an organisation jointly owned by the banks with the purpose of facilitating bank giro procedures. The system has a central institution called the Bank Giro Centre.

## 3. Instruments

The basic payment services which are offered by the Postal Giro and the Bank Giro are inpayments, outpayments and transfers. By mixing these basic services, a variety of payment transactions are possible. Even if the procedures are much the same, the Postal Giro is far more important than the Bank Giro, particularly in the two sectors of government payments and payments by individuals. The Postal Giro's share of the overall total of transactions is about 87 per cent. The Postal Giro and the Bank Giro can function both as a completely cashless system and as a hybrid system.

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The savings banks have started a trial project in order to evaluate a point-of-sale system. In a district in southern Sweden customers can pay directly through their savings accounts in some twenty petrol stations and stores.

### (a) Postal Giro

Details of the total number of payments effected by the Postal Giro in the last two financial years are given in the following table.

<u>Numbers (millions)</u>	<u>1976/77</u>	<u>1977/78</u>
Transfers	88	92
Inpayments	176	176
Outpayments	50	44
Total	314	312
<u>Volume (millions of dollars)</u>		
Transfers	299,700	440,100
Inpayments	100,700	115,100
Outpayments	96,000	109,400
Total	496,400	664,600

The payment transactions carried out by the Postal Giro are of all kinds, ranging from small payments between individuals to the Government's payments which can amount to several billion kronor in a day.

The payments it transacts, being cashless, are effected by means of transfers between various postal giro accounts. The book-keeping, the crediting and debiting of accounts, and the printing of the notifying account statements are all done by computer. Smaller enterprises and individuals initiate a transaction manually by sending special giro forms by post, ordering the Postal Giro to debit the payer's account and to credit the payee's account or to pay the amount in cash. The payment orders of larger companies are now generally sent to the Postal Giro on magnetic tape. The latter method is used by firms with a large number of payments. There is also a procedure for direct data transmission from a client's computer to that of the Postal Giro Centre. For firms which receive large numbers of inpayments (rents, premiums, mail order payments, etc.), the inpayment cards are printed in such a way that they can be optically read in the Postal Giro Centre. The data are then delivered to the account holder on magnetic tape with the account statement.

In the so-called auto-giro service (direct debiting) the amounts are transferred automatically from payer to payee on the initiative of the payee if the payer has given his authorisation. This service is also offered by the Bank Giro.

The Postal Giro can also function as a hybrid system. In a payment transaction where only one of the participants - the payee or the payer -



has a postal giro account, an inpayment can be effected in cash at a post office or an outpayment order form can be cashed at a post office.

A payment transaction at the Postal Giro is effected on the same day if the transaction order is received by the Giro Centre in Stockholm before 9 a.m. The exception is when the payer sends a bank cheque in order to cover the outpayments. Normally the transaction will then be effected on the second day, but if the transaction order is posted in a special red envelope the transaction will be effected the same day.

(b) Bank Giro

The Bank Giro can be concisely described as a system for transfers between bank accounts. In contrast to the Postal Giro there is no need for special payment accounts as the ordinary business account in a bank - normally a cheque account - is linked to the giro system. And the updating of the accounts is done by the account-holding bank.

The services offered by the Bank Giro are rather similar to those offered by the Postal Giro, e.g. OCR-service, auto-giro services, data media input, direct data transmission, etc. The main difference is that payment documents are handed over to the system at the local bank office, which debits the payer's account and then forwards the documents to the Bank Giro Centre. Payers using data media input have a direct link with the centre, however.

The main task for the centre is to sort and check all giro transactions, notify the beneficiary and supply the banks with accounting data. The centre is also used for a number of other joint banking services. The data clearing between the banks is run through the centre, wages and pensions are channelled to the banks via the centre, etc.

The Bank Giro can also be used if only one of the parties has a bank giro account. The beneficiary receives a payment order which is redeemable at any bank instead of notification that his account has been credited. A payer without a bank giro account can make an inpayment to any bank teller.

The general timetable for the handling of a bank giro document is that it is handed over to the local bank office on day one and processed by the centre on day two. In the evening of day two the bank accounts are updated, and the beneficiary is notified by ordinary mail on the morning of day three.

The numbers of transactions and the volume of all payments passing through the Bank Giro during 1977 are shown in the following table.

	<u>Number (millions)</u>	<u>Volume (millions of dollars)</u>
Transfers	29	52,600
Inpayments	21	14,500
Outpayments	5	2,800
Total	55	69,900

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At the end of 1977 82 per cent. of bank giro accounts belonged to enterprises, 17 per cent. to individuals and 1 per cent. to others.

### (c) Cheques

A payment transaction through a bank is normally effected either by Bank Giro or by writing a cheque. The Bank Giro is used mostly by enterprises, whereas individuals tend to use cheques.

The usefulness of cheques as a means of payment is a result of the co-operation between the banks. The banks redeem each other's cheques irrespective of the bank on which the cheque is drawn. Cheques for amounts not exceeding S.kr. 500 can be cashed at any post office. Consequently, a cheque can be used in all banks and post offices anywhere in Sweden. As a result of this collaboration, almost one-third of all cheques which are redeemed are issued by a bank other than the redeeming one. The importance of the cheque as a means of payment is also enhanced by its double function, i.e. it can be used by the issuer either to obtain cash or to make a payment.

The number of cheque accounts held and the volume of cheques used have increased substantially during the last twenty years, largely because of the introduction of changed arrangements for paying salaries. The rate of increase has now slowed down, since almost all kinds of need have been met. Some 120 million cheques are now issued every year, and this figure is likely to decrease rather than increase. The reason for this is that the banks, to cut costs, have imposed charges for low-value cheques. The cash dispensers to which reference is made below will also reduce the volume of cheques.

The salary payment procedures introduced in the early 1960s have been cited as a reason for the increase in the number of chequing accounts. Almost all employees in Sweden have their wage or salary transferred to a bank account (known as a "bank wage and salary account"). A great number of individuals therefore automatically have the possibility of using the cheque as a means of payment.

The cheque is often used by individuals as a means of obtaining cash. It is, however, also used for small payments to retailers and for other kinds of payments. Cheques issued as a means of payment are usually subject to a ceiling of S.kr. 1,000 in an attempt to minimise the impact of cheque payment incidents.

### (d) Automated cheque clearing

Since the banks redeem each other's cheques, a system to settle the debts and claims arising between them is needed. Before 1975 this clearing system was paper-based, but it is now computerised via the Bank Giro.

The impetus for a computerised cheque clearing system developed when the banks equipped themselves with teller terminals. The banks booked each other's cheques by computerised means but had to remove the clearing cheques manually so that they could be forwarded via the central

bank to the issuing bank, where they were booked anew. It was therefore quite natural for a system of computerised clearing to be developed.

Before the system could be introduced, a considerable amount of work to standardise account numbers, identification, descriptions, layouts, etc. had to be done. The filing procedures were important because it was intended that the redeeming bank should file the cheque and transfer only the details of the transaction to the issuer. The basic principle is that the clearing is effected between the banks' data-processing centres, with the Bank Giro as a connecting link. Tellers therefore enter all cheques, irrespective of the issuing bank, on their terminal, which, in most banks, is on-line to their bank's computer centre. The computer can sort the cheques according to the account number, and all clearing cheques are grouped on a special magnetic tape which is sent to the Bank Giro every day by 11 a.m. The Bank Giro performs the outward clearing between the banks. The transactions dealt with in the outward clearing are returned on magnetic tape to the receiving bank's computer centre, whereupon accounts can be updated. The maximum time it takes for a cheque redemption to be booked is one and a half days.

Before a magnetic tape is sent to the Bank Giro the transactions recorded on it are added together to arrive at the position against each bank. These amounts are reported to the central bank, where they are booked on each bank's cheque account.

All cheques are filed by the cashing bank and the issuing bank receives only the accounting data plus a code to tell it where the cheques are filed. Should the issuing bank need a cheque, it can be produced by referring to the code. This procedure seems complicated, but only one cheque in about ten thousand ever has to be consulted.

The clearing procedure is regulated by an agreement between the participating banks. The agreement states that the bank which issues a cheque shall pay a specific charge for each transaction to the bank which cashes it. The handling costs of the Bank Giro are apportioned between the banks on the basis of the number of cleared transactions they receive.

The new clearing system has lived up to expectations. Costs have been cut partly because each cheque is filed only once, and partly because the amount of physical handling has been reduced. Another advantage is that tellers can work more efficiently and faster because of the standardisation.

The same clearing system is also used for other kinds of transactions, and the objective is that as many types of transactions as possible should ultimately be included.

#### 4. Rôle played by the central bank

As mentioned earlier, the Swedish banks perform a variety of services on behalf of one another. One effect of this is that a considerable

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amount of bank data has to be exchanged. The clearing procedure for cheques has already been described; the clearing is settled when the accounts which all the banks participating in the clearing system hold with the central bank are updated.

Apart from this, the Bank of Sweden plays a passive rôle with respect to domestic cashless payment systems.

### 5. Level of automation

The payment systems offered by the Postal Giro and by the Bank Giro are almost entirely computerised.

The Postal Giro has always used mechanical facilities from the time of its inception more than fifty years ago. In the 1930s the Postal Giro used advanced book-keeping machines, in the 1940s punched cards and punched card machines were used, and the 1950s saw the advent of the computer. In the early 1960s the Postal Giro initiated the optical reading of forms, and in the middle of the 1970s the Post Office started introducing teller terminals in the post offices for regular customer service. So far about 3,100 teller terminals have been installed.

The Swedish banking system is likewise highly computerised. Every bank, except smaller savings banks, use computerised procedures, even if they do not possess their own computer. Of the commercial banks, only the largest ones have their own computers while the small ones either use service bureaux or have joined together to invest in a computer. Almost all savings banks use a single computer.

## IV. HYBRID PAYMENTS

As mentioned earlier, both the Postal Giro and the Bank Giro can function as a semi-cashless system. The banks and in particular the Post Office perform not only purely cashless payment services, but also offer facilities for combined cash/deposit money transfers. If the payee has a giro account but the payer has not, or vice versa, semi-cash transfers can be made. A payment can also be made through the Post Office when neither the payee nor the payer has a giro account, namely by means of a money order obtained from and transmitted via the Post Office. This was the usual method before the giro system became common.

Automated cash dispensers and credit cards can also be regarded as hybrid payment systems.

### (a) Automated cash dispensers

Today there are two automated cash dispenser systems. One system - Bankomat - is managed by the commercial banks and the co-operative banks, while the other system - Minuten ("The Minute") - is managed by the savings banks.

Both these systems may be used solely by the holders of "wage and salary accounts", and both only permit cash withdrawals by the customer. The customer gets a plastic card with which he can operate the machine.

There are at present about 100 Bankomats and about 350 "Minutes" spread throughout Sweden. A customer with a Bankomat card can use any Bankomat in the country, and a customer with a "Minute" card can use any "Minute" in the country, but there is no link between the two systems.

The Bankomat system is administered by a special centre - the Bankomat centre - which has entrusted the Bank Giro with the task of handling the clearing between banks belonging to the system. The Bank Giro clears the transactions in the same way as cheques. Transactions between savings banks belonging to the "Minute" system are cleared by the savings banks computer company, which also administers the system.

It is planned to reorganise the Bankomat system completely in 1980. The number of cash dispensers will increase to about 400 and it will also be possible for customers to check the balance on their accounts via a cash dispenser. The Bankomat will then be operating on-line as the "Minute" already is. Negotiations are in progress concerning the linking of the Bankomat and "Minute" systems.

(b) Credit cards

In the last five to ten years it has become more and more common for households to use credit cards, and the trend will probably continue in the future.

Credit cards are issued solely by special credit card companies. There are today about forty different credit card systems. Most of them are very limited and are only valid in an individual store. Only three to five card systems could be said to cover the whole country and a large number of stores. At the end of 1977 something in the region of 500,000 credit cards were held by the Swedish public. It has been estimated that the average credit card holder uses his card twelve times a year and that his average purchase amounts to around S.kr. 140.

The procedures at the credit card companies are, in most cases, fully automated, while those at the stores are manual. The payments between the credit card companies and the stores, and between the credit card holders and the credit card companies, are mainly effected via the Postal and Bank Giro systems.



9. SWITZERLAND





The Swiss payment system is based on cash, giro transfers, cheques and automated bank transfers.

I. CASH PAYMENTS

1. Historical origin

Standard money (the real value of which is equal to its nominal value) played a dominant rôle in the Swiss economy until quite a late stage in its development. Up to 1850 such money was by far the most important payment instrument. At that time the money supply amounted to about Sw.fr. 122 million, of which more than four-fifths consisted of standard money in the form of coins. Most of these coins were issued by foreign countries and there was a great variety of them in circulation. This disorderly situation was rectified when an issuing monopoly was conferred on the Federal Government in 1850. This was an important step towards establishing a single uniform economic region. Owing to the lack of natural resources, the Government decided to declare French, Belgian and Italian silver coins as equivalent to Swiss coins. However, the main difficulties involved in using standard money - extreme fluctuations in the demand for and supply of silver and their inflationary and deflationary repercussions - could not be solved.

Token money (the real value of which is less than its nominal value) was already known, but its geographical range was limited.

The issue of bank-notes started very late in comparison with other countries. In the United Kingdom, for instance, more than 50 per cent. of the money supply consisted of bank-notes by the end of the 18th century. In Switzerland the corresponding percentage was not much greater than zero. The reason for this different development is that the British Government had enormous difficulties in providing industry with a sufficient quantity of payment media. Bank-notes therefore began to take the place of standard money, thereby contributing significantly to the rapid development of the British banking system.

In Switzerland, on the other hand, hundreds of different coins were in circulation and there was hence no pressure for new payment instruments.

The first bank-notes were issued by private banks at the end of the 19th century. Generally speaking, however, they had only limited geographical range. Standardisation agreements between the private banks did not prove sufficiently successful, so that in 1906 the issue of bank-notes was monopolised in the hands of the central bank.

2. Legal basis

Notes and coin are the official medium of exchange and are legal tender in Switzerland and Liechtenstein. Exclusive coinage rights are

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vested in the Federal Government under the terms of the Coinage Act of 18th December 1970. Coins are legal tender in quantities of up to one hundred at a time.

The note-issuing monopoly is regulated by the Central Bank Act of 23rd December 1953. Under that Act, the central bank is not only required to issue bank-notes but also to contribute to the development of an optimal payment system.

### 3. Suppliers of the service

The pattern of currency circulation is broadly the following:

- (1) The central bank supplies currency to the banks in large amounts.
- (2) The banks meet the needs of companies which
- (3) have to pay out wages and salaries in cash.
- (4) Wage and salary-earners normally meet their obligations (bills) by paying cash to retailers and at the post offices. Savings are also paid into the banks in cash.
- (5) The banks and post offices place their excess cash with the central bank,
- (6) where the notes are counted, checked for counterfeits and damaged notes are separated from those in good condition.

This money flow has been changing rapidly as companies switch over to salary accounts. However, customers have not yet changed their payment habits to the extent of engaging in cashless transactions on a large scale. Banks still see considerable growth potential in this field in the years ahead.

### 4. Participants in cash payments

The main participants in the cash transfer system are wage and salary-earners, consumers, retailers and the post offices. From 3. above it can be seen that nearly all economic units are involved in the cash payment system. The ratio of currency in circulation to gross national product is 13 per cent., an extremely high percentage as compared with other countries.

### 5. The payment instruments used

Coins exist in nine denominations ranging from Sw.fr. 0.01 to Sw.fr. 5.

Bank-notes are issued in six denominations ranging from Sw.fr. 10 to Sw.fr. 1,000.

Until 1969 coins had a silver content of 835/1000. However, with the rise in the price of silver in 1967, the real value of the coins exceeded their nominal value and nearly all of them disappeared from circulation. After this, the silver was substituted by other metals.

6. The nature of payment transactions

Cash is the dominant medium of payment used by private households. Nearly all transactions between consumers and retailers are effected in cash, and bills are also paid in cash through the post offices. Cash is not used between banks and companies.

7. The rôle of the central bank

The central bank is responsible for the whole life cycle of bank-notes from their design and production to their withdrawal and destruction. Distribution and withdrawal are effected through the two head offices and eight branches of the central bank. These primarily supply the banks and post offices which, in turn, are in direct contact with companies and private households.

8. Degree of automation

Highly advanced machines have been in use since last year. The new series of bank-notes in circulation is designed to permit the automation of such labour-intensive tasks as counting, checking to detect torn or unfit notes, forgeries, etc.

9. Responsibility for the currency

The central bank bears most of the responsibility for management of the currency. This is important, since the degree of automation is a function of the technical features of the paper instrument. The new bank-note series in Switzerland, for instance, incorporates all known technical elements capable of increasing the level of automation.

10. Cost of cash transactions

Relatively reliable statistics are available on the cost of payments made through a post office; the average cost of a cash inpayment is 40 US cents. (By comparison, a postal giro transfer costs an average of 11 US cents.) Other figures on costs are not available.

The average value of an inpayment is US\$ 171.

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### II. CASHLESS PAYMENTS

#### 1. Historical basis

The first cashless payment system in the form of a giro was introduced relatively late in Switzerland. The first large-scale service was offered by a bank in Zurich at the beginning of the 19th century. There was no system covering the whole country until the establishment of the central bank. At around the same time the Postal Administration founded the postal giro (postal cheque system), which still plays a leading rôle in the transfer system. Until the end of the 1950s the bank giro system was geared primarily to the company sector. The household sector was only marginally served by the banks. This situation changed in the 1960s, however. The rising standard of living of households made them eligible for such facilities, so that keen competition developed for their custom.

#### 2. Legal basis

Special legislation exists only in the case of cheques. The payment services provided by the banking sector, in contrast to those offered by the postal giro system, are virtually exempt from regulation by the public authorities. The postal authorities, for instance, are not allowed to open savings accounts or to grant overdraft credits. The charges on the various transfer instruments and the interest rates on cheque accounts are also strictly regulated. The postal giro system is therefore at a competitive disadvantage.

#### 3. Suppliers of the service and their economic function

The following description concentrates on the giro systems, the dominant cashless payment systems in Switzerland.

##### 3.1 Introduction

In Switzerland there are three institutions offering giro services:

- the central bank,
- the Postal Administration, and
- the banks.

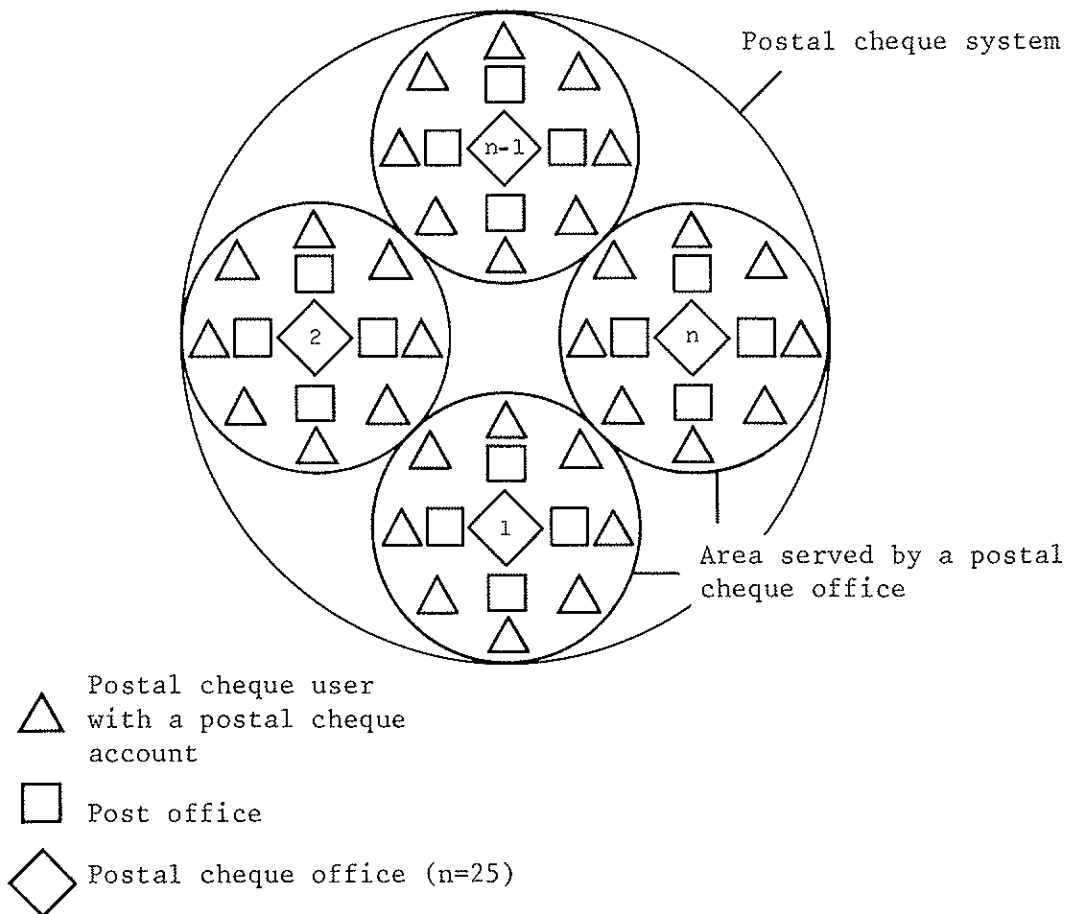
Taking the number of giro transactions\*1) as the criterion for measuring the relative importance of the three systems, the following result is obtained: (1) postal giro (90 per cent.); (2) bank giro (9 per cent.); and (3) central bank giro (1 per cent.).

Only the two main systems, the postal giro and the bank giro\*2), will be discussed here.

3.2 The postal giro\*3)

3.2.1 Survey (see Chart 1)

Chart 1: The organisational structure of the postal cheque system



3.2.2 The system of postal cheque accounts

(a) Characteristics

From an organisational point of view the postal cheque account is the smallest element in the postal system; its main characteristics may be summarised as follows:

- no payment of interest
- no initial deposit\*4)
- a statement of account produced free of charge twice a month

## Switzerland

- giro transfers executed free of charge
- types of transaction:
  - . cash inpayments
  - . cash outpayments
  - . giro transfers
- no third party cheques may be presented
- no overdraft facilities (i.e. no credit)
- postal cheque accounts are designated by a number, the name (company name) and address of the account-holder. Accounts may not be held under a pseudonym. Moreover, a register is published containing the names of all account-holders\*5).

### (b) Structure

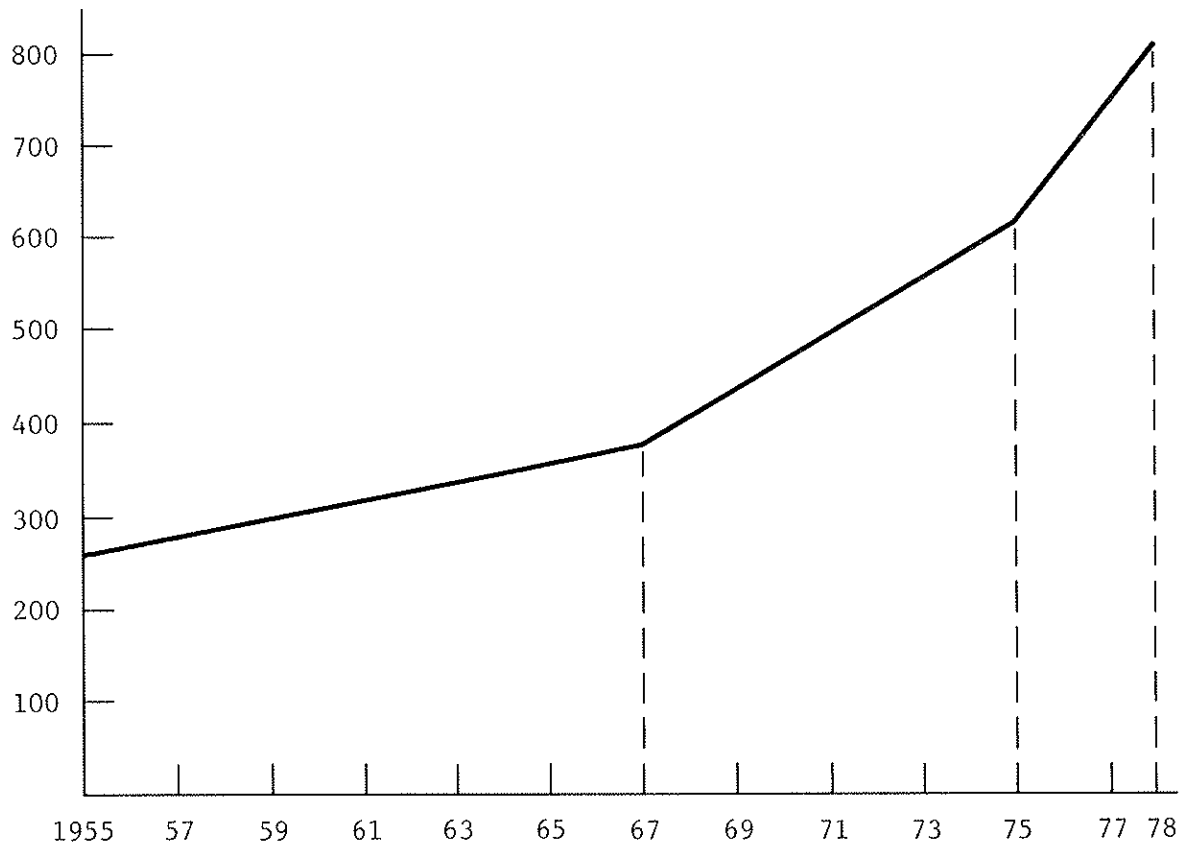
As the system of postal cheque accounts can best be described in terms of the characteristics of account-holders, it is expedient to analyse not only the change in the number of postal cheque accounts over time but also the categories into which postal cheque account-holders fall and changes in these categories (see Chart 3). However, the first aspect to be examined will be the quantitative changes over time in postal cheque accounts.

Chart 2 shows that the number of postal cheque accounts has grown steadily. There was a pronounced shift in the trend in both 1967 and 1975; whereas in the twelve years from 1955 to 1967 the number of accounts rose at an almost constant rate of 8,000 per year, from 1967 to 1975 the increase averaged 27,000 per year and from 1975 to 1978 the average rise totalled 70,000 accounts per year. If the proportion of the total population holding postal cheque accounts is taken as an indicator of the success of the cashless payment system, the result for the period 1955-67 proves to be rather modest, as the proportion rose by only 1 per cent., from 5 to 6 per cent.\*6). Far more progress was made in the following period (1967-74), as the rate of increase accelerated from slightly over 2 per cent. in 1967 to more than 7 per cent. by 1974. In the final period (1975-78) the rate of increase was as high as 10 per cent. The main reason for this marked change was the introduction of the direct crediting of wages and salaries.

However, since most transactions are still effected in cash or involve the handling of cash at some stage, post offices assume considerable significance as a further element in the postal cheque system. They constitute the most important link between the cash system and the cashless payment system operated by the Postal Administration. As far as monetary transfers are concerned, the chief function of the post offices is to receive and pay out cash. For this purpose the Postal Administration has at its disposal a dense network of over 4,000 post offices spread throughout Switzerland\*7). The fact that there are post

offices even in remote areas is of particular importance. The widespread distribution of post offices is primarily due to the obligation imposed on the postal authorities by their charter to provide a large proportion of their services to all households. This contrasts with the banks, which are able to confine their network of branches to areas where their operations are likely to be profitable.

Chart 2: Number of postal cheque accounts (in thousands)



### 3.2.3 The postal cheque offices

The third sub-system of the postal giro consists of the account-keeping postal cheque offices. Each transaction flows through such an office where it is credited and/or debited. The Swiss postal giro system is decentralised and comprises twenty-five postal cheque offices, a

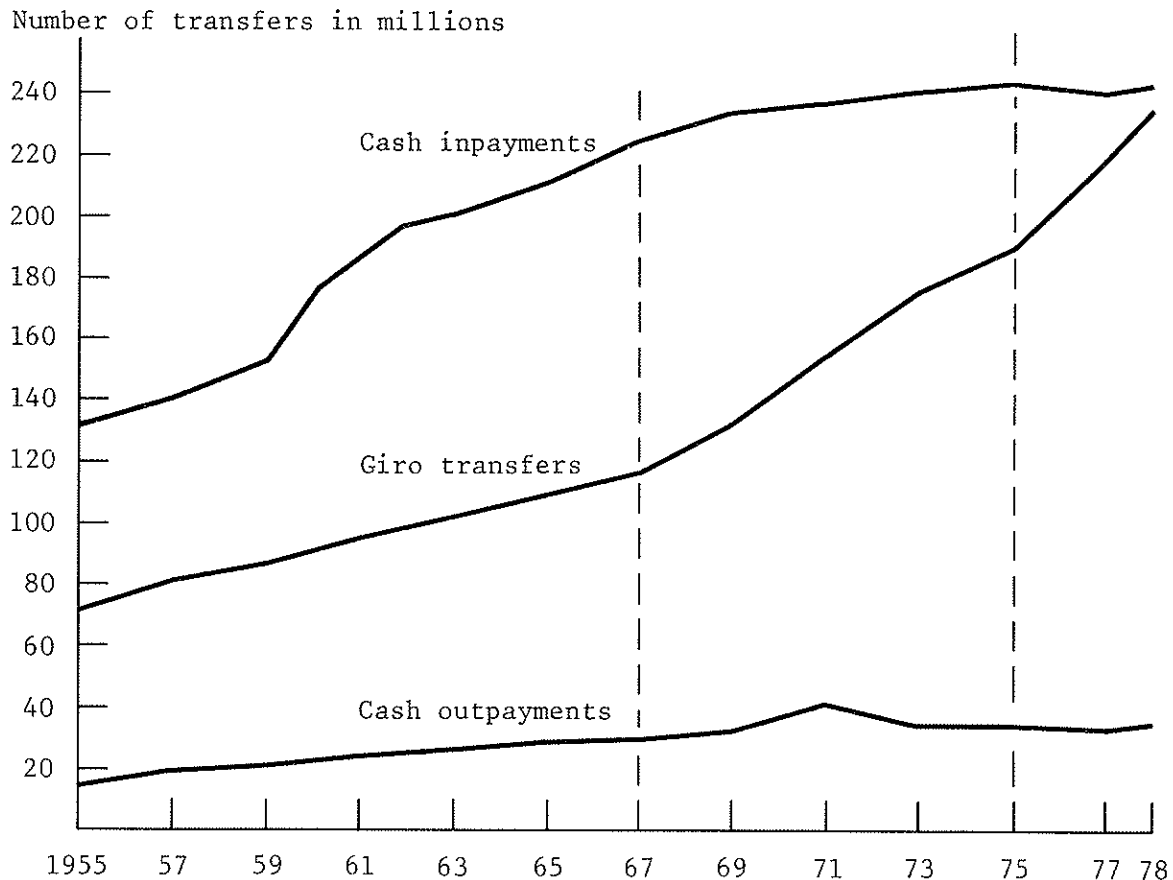
## Switzerland

number which, in the light of modern transmission technologies, is much too high.

### 3.2.4 Postal giro services

Chart 3 shows the three main types of postal giro transfer: (1) inpayments, (2) outpayments and (3) giros. The dominant rôle played by inpayment transfers, which are effected by private households at the post offices in cash form and are credited to the giro accounts is clearly illustrated. The rôle played by normal giro transfers is also illustrated in Chart 3. It is important to note that the postal giro system, unlike the banks, does not issue cheques that can be used as a payment instrument in the retail sector.

Chart 3: Main monetary transfers in the postal cheque service





3.3 The bank giro

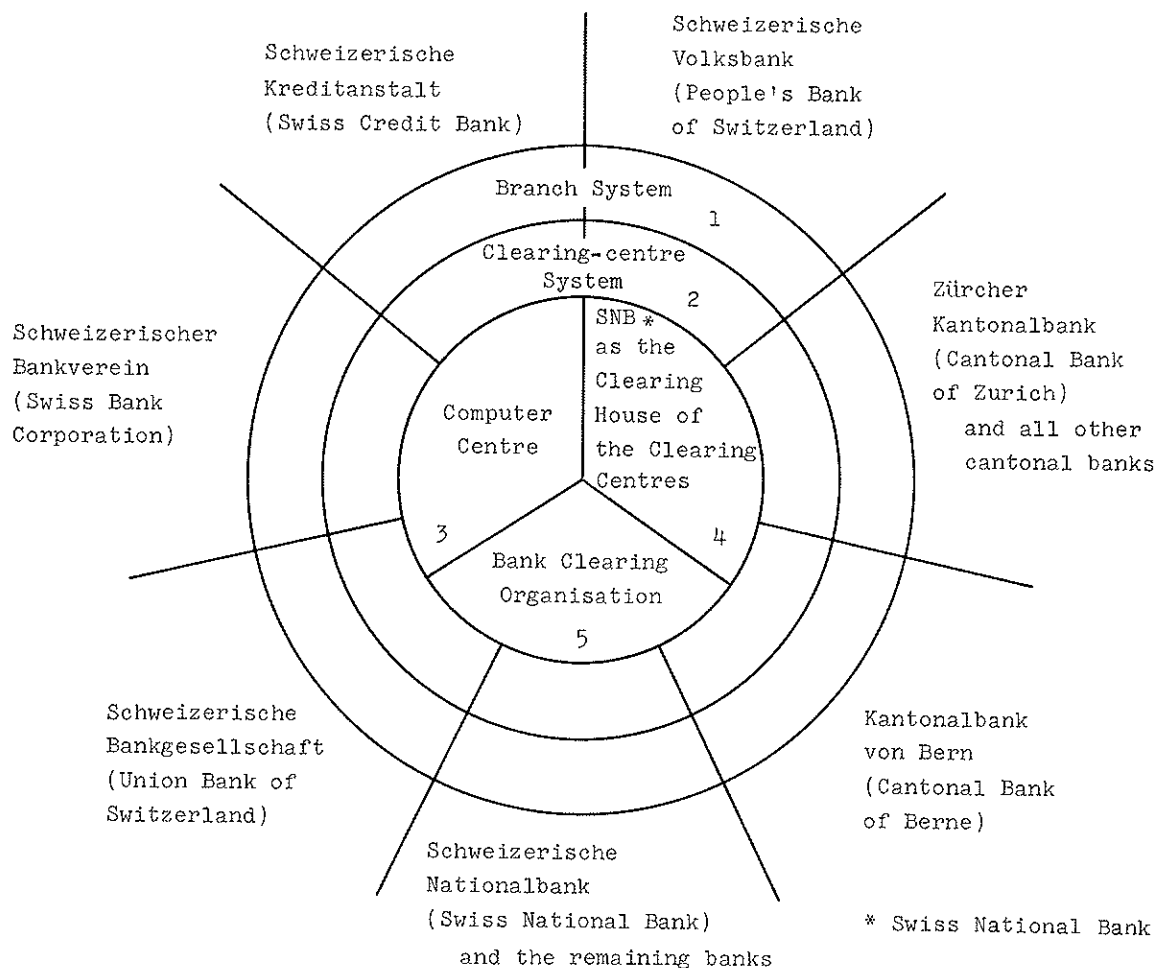
3.3.1 Introduction and general survey

Chart 4 shows, in greatly simplified form, the overall structure of the banks' giro payment system (hereinafter referred to as the "bank clearing-house system" or "BC system"). The following sub-systems can be identified:

- the branch system,
- the clearing-centre system,
- the Swiss National Bank (SNB) as the clearing house of the clearing centres,
- the computer centre (Automated Clearing House),
- the Commission for the Payment System.

The first two of the above-mentioned sub-systems can be subdivided further on the basis of affiliation to a clearing centre (see the corresponding segments of the circle in Chart 4)\*8):

Chart 4: The organisational structure of the bank clearing centres



## Switzerland

- the Schweizerische Bankgesellschaft (Union Bank of Switzerland);
- the Schweizerischer Bankverein (Swiss Bank Corporation);
- the Schweizerische Kreditanstalt (Swiss Credit Bank);
- the Schweizerische Volksbank (People's Bank of Switzerland);
- the Zürcher Kantonalbank (Cantonal Bank of Zurich), acting as the clearing centre for all member cantonal banks except that of Berne;
- the Kantonalbank von Bern (Cantonal Bank of Berne);
- the Swiss central bank, acting as the clearing centre for all other banks participating in the BC system.

These sub-systems will be described briefly below, with special emphasis on aspects of the monetary transfer system.

### 3.3.2 The bank-branch network

The bank-branch network is concerned mainly with sight deposit accounting, in contrast to the post offices where no accounts are kept. This means that bank giro transfers are normally sent to the bank branch of the payer, where the account is debited, and are then transmitted through the clearing centres to the branch of the payee.

### 3.3.3 Clearing centres

The clearing centres form another sub-system of the bank clearing-house system (see Chart 4). The clearing centres, through which giro transactions are channelled, are the processing and accounting centres of the bank clearing-house system. As Chart 4 shows, each of the three largest banks, the Schweizerische Volksbank and the Kantonalbank von Bern possesses its own clearing centre. The Zürcher Kantonalbank is the clearing centre for all other cantonal banks and the Swiss National Bank acts as the clearing house of the clearing centres\*9). The clearing centre of the SNB serves 190 institutions with a total of more than 500 branches.

From an organisational point of view, it is significant that, with one exception, all the clearing centres are located in Zurich. The BC system - unlike the postal cheque system with its twenty-five offices - has a highly centralised processing structure. Seen as a whole, the present structure based on clearing centres has the advantage of providing a good foundation for further development towards a single clearing centre.

On the other hand, a disadvantage of the centralised structure is that items sent to and from the more remote districts take longer to arrive. This is not a serious drawback, however, as Switzerland is a relatively small country. Furthermore, this factor is likely to become less significant with the development of electronic payment systems.

### 3.3.4 The computer centre (Automated Clearing House)

To complete the picture, mention should be made of yet another sub-system of the bank giro system - the computer centre (see Chart 4). Customers' transfers, which since 1975 have included a line of optically readable code, can to a large extent be processed automatically at the data-processing centre. The same is true of the data carriers prepared by firms for cashless wage and salary payments. This electronic processing centre, which is an essential element of any electronic payment system, is likely to become considerably more important with the development of paperless payment media.

### 3.3.5 The Swiss central bank (SNB) as the clearing house of the clearing centres

Chart 4 illustrates a further sub-system, namely the SNB as the clearing house of the clearing centres. Its function derives from the fact that all the clearing centres have an account (giro or bank clearing-house account) at the Zurich office of the SNB and that the total debtor positions of the individual clearing centres can thus be offset against each other.

Despite this centralisation of accounts, the original idea of establishing a clearing house (mutual offsetting of debit and credit balances) has never been realised. As a result, on the assumption that each bank has sufficient central-bank money available to cover all its payments, the volume of central-bank money actually required by the payment institutions will be considerably greater than it would be in a clearing-house system. The above assumption is not totally founded, however, since the necessary cover is not always available in practice, particularly in the case of the large banks, which can be expected to receive substantial inpayments. For a short time therefore (until the payments arrive from the other clearing centres), a negative balance exists.

For banks which are affiliated to the SNB clearing centre this procedure is used only for relatively small payments. For transfers involving large amounts (more than Sw.fr. 1 million), the SNB is obliged to resort to clearing since the balances which are held for settling payments are far from sufficient to enable transfers to be executed without taking account of inpayments. Both these factors mean that the cash holdings of the banks participating in the system are considerably smaller than should theoretically be the case when transfers are handled without clearing.

### 3.3.6 The Commission for the Payment System

The final element of importance in the organisational structure of the system is the bank clearing organisation. It is a straightforward company with the object of facilitating transfer payments in the banking system.

## Switzerland

### 3.3.7 Quantitative structure of transactions in the bank giro

Number of bank payment transactions per day  
(Average for the period from 20th May to 5th June 1974)

Bank giros (transfers)	75,000
Cheques	13,800
Bankomat (cash dispensers)	5,200
Interbank payments*10)	21,600
Cashless electronic wage & salary payments	2,500
Bank/Postal Administration	<u>97,400</u>
TOTAL	<u>215,500</u>

### 3.4 Users of the service

The postal giro system is used by all population groups (see 3.2.2 above). The bank system is primarily used for payments between companies, but this is changing now with the widespread introduction of salary and wage accounts.

### 3.5 The payment instruments

The main instrument in the cashless system is the giro. The cheque is now promoted in the form of the standardised "Euro-cheque", which can be processed automatically. Direct debits are only possible in the banking system. Their volume is comparatively insignificant. All other payment media, such as receipts, bank cards, credit cards, crossed money orders, etc. are of minor importance.

### 3.6 The nature of payment transactions

See 3.2.2 and 3.2.5 above.

### 3.7 The level of automation

Both the postal giro system and the banks work with machine-optical vouchers, and to some extent with paperless exchange data media. Both groups have their own computer centre.

- The Bank Automated Clearing House was established by all the Swiss banks in 1971. To start with, the centre processed only MICR encoded giro-credit transfers. In 1976 the bank introduced a magnetic-tape exchange system which enables bank clients with their own EDP installation to send magnetic tapes to the Automated Clearing House. This system is now operated in the field of payment orders and salary payments.

The client can also fix the date on which the payment is to be made. The tapes on which details of payment orders or salary payments are recorded go direct to the Automated Clearing House, where they are

processed and distributed to the receiving banks in magnetic-tape or paper form.

The market share of the Automated Clearing House transactions is growing fast but is still small (about 10 per cent. of all cashless transactions).

Furthermore, the Automated Clearing House is not owned by the banks. It is a service centre and the banks pay a fixed sum for new installations and a fee for each transaction.

There is no access problem, all banks being entitled to participate. Only a small number of banks pass through another bank.

- The postal giro has also installed a kind of automated clearing house. Its function is limited on the input side to the processing of OCR paper-based giro transfer instruments and on the output side to the production of magnetic tapes and punched cards.

These media give the receiving company or public authorities the advantage of automated processing of accounts receivable. The system met with immediate success. The market share of the transactions processed in this way grew rapidly to about 20 per cent. of all giro transactions in Switzerland. The transaction costs of such transfers are less than half those of a normal giro transaction.

Access to the system is open to all customers including the banks.

### 3.8 Responsibility

The management of the Postal Administration bears sole responsibility for the system. The banks have set up an institution called the "Commission for the Payment System", which is a group under the management of the Swiss Bankers Association. The Swiss central bank is a member of this group. (See 3.3.6 above.)

### 3.9 Cost considerations

Reliable figures are available only for the postal giro system. The average value of a postal giro transfer is US\$ 2,160 and the cost per transaction is 11 US cents. The average value of a bank transaction is much higher than that of a postal giro transaction. A bank transaction is also more costly than a postal payment, because the bank system is more complicated and cumbersome. A second reason for the higher cost is that the decision-making process is much more intricate (numerous banks involved in taking decisions) than in the postal giro system (only one decision-maker: the management of the Postal Administration).

### 3.10 Summary

The most significant points with respect to the instruments used in the Swiss payment system may be summarised as follows:

## Switzerland

- more than 95 per cent. of all funds transfers are still paper-based,
- giro transfers (credit and debit) and cash payments predominate, and
- cheque transfers are of minor importance.

Summing up what has been said about the organisational structure of the bank clearing system and comparing it with the postal cheque system, it may be stated, in justifiably simplified terms, that the distinguishing feature of the bank clearing system is its decentralised book-keeping and centralised processing structure, whereas these functions are to a large extent decentralised in the postal cheque system.

### III. HYBRID PAYMENTS

#### 1. Semi-cash credit transfers

- An estimated 70 per cent. or so of Swiss households pay their bills at the post office in cash (see 3.2.5 above). A rapidly growing proportion of these bills (giro) are micro-encoded and can therefore be processed electronically (about 20 per cent. in 1978).

- Cash outpayments to households are executed by the postal giro alone by postal delivery. For cost and security reasons the postal giro system is now replacing this method by a micro-encoded voucher with which payees can collect their money at a post office. For the customer this means a reduction in the level of service offered by the postal giro system. The overall transaction costs may even have increased.

#### 2. Automated cash dispensers and automated teller machines

The cash dispenser is a great success in Switzerland, primarily because of the population's predilection for cash payments. The introduction of salary and wage accounts was a major factor in the growing demand for this service. Cash dispensers initially used the off-line mode and, to minimise the risk of abuse, their number was until 1978 limited to 100 units, at which \$0.5 million was paid out each day (\$5,000 per machine).

- In the course of 1978 all cash dispensers were replaced by units connected to a central computer. This technology will permit an expansion of the network in accordance with demand.
- The existing cash dispensers are all bank-owned and can be activated by means of a single card. The postal giro initiated a system of its own on an experimental basis in 1978, and plans to introduce it in the next few years in all the larger towns.

- The introduction of automated teller machines is still in an experimental phase. There are as yet only about ten machines in operation.

Footnotes

- \*1) This criterion is a good indicator of the volume of resources in the payment system and is in this sense an important standard of reference for the development of an optimal monetary transfer system.
- \*2) See Kevin J. Kearney, conference paper prepared for the BAI Inter-Industry Conference on Corporate-to-Corporate EFTS, March 1977, New York, p. 8 et seq.
- \*3) See Josef Marbacher, Das Zahlungsverkehrssystem der Schweiz, Berne 1976, p. 151 et seq. (Translation by the BIS).
- \*4) The initial deposit of Sw.fr. 50 was abolished on 1st June 1969 "in order to (make) the postal cheque account even more consistent with a cashless payment system" (PTT, 1969 Annual Report, p. 14).
- \*5) This contrasts with the practice of the banks, which do not publish registers of accounts and which allow accounts to be held under a pseudonym.
- \*6) In this period the resident population increased from 5 to 6 million; see 1973 PTT Statistics, p. 126.
- \*7) There are around 3,000 communes in Switzerland.
- \*8) See BC, Technical Directive, page 1.
- \*9) See BC, Technical Directive, pages 1 and 28.
- \*10) Interbank payments are transfers from one bank to another, as for example in connection with the collection of cash against documents, the redemption of mortgage notes, security-issue underwriting business, call loans, and so forth.





10. UNITED KINGDOM



I. INTRODUCTION

A wide variety of methods are available in the United Kingdom for Government, businesses and individuals to make and receive payments. Since almost all payments are dependent in some way on the services provided by the banking industry it is necessary to consider payment systems within the context of UK banking generally.

Altogether there are some 360 banks operating in the United Kingdom. Of these, about half are branches of overseas banks providing a range of international banking facilities to their customers. It is, however, the six London and three Scottish clearing banks with their large branch networks, together with the Co-operative Bank and the Trustee Savings banks, that provide the basis for the domestic banking system.

It is estimated that some 50 billion payments are made in Britain each year and that about 90-95 per cent. are in cash, with cheques drawn on the banking system accounting for the bulk of the remaining 5-10 per cent. The clearing banks have a major rôle in the provision of cash throughout the country and also handle the majority of all non-cash payments. In 1978 it was estimated that some 120,000 employees, representing about 60 per cent. of the banks' staff, were engaged in this work. The value of capital resources employed by the clearing banks to provide such services were of the order of £1,000 million and the operating costs were about £800 million per annum.

The nature of payment systems and the speed with which they have been developed have been dictated largely by the banks themselves, not only to foster the banking habit, but to take full advantage of the technological changes and to contain the rapidly escalating costs of traditional systems. The concentration of banks and their head offices in London has tended to assist the development of common systems with a measure of co-operation, but without abandoning the competitive basis of the banking system.

The Government and the central bank do not seek to regulate the payment mechanisms and their involvement has generally been limited to the Bank of England's participation in the paper and automated systems on behalf of its own customers, including government departments, and as the ultimate settlement bank. It is through this participation that the authorities are kept fully informed of developments and are able to encourage and support the banks in the introduction of more effective and economic facilities for money transfer which can be of benefit to the community as a whole.

The payment services provided over the Post Office counters account for some 10 per cent. of all non-cash payments. These include postal orders and National Girobank transactions.

The method of payment adopted in particular circumstances can be largely a matter of individual preference. The use of bank media is favoured by a higher proportion of individuals living in London and the South East of England than elsewhere in Britain. It is now usual for

## United Kingdom

public utilities, local authorities and other large receivers of payments to offer a number of alternative methods for the settlement of accounts.

Budget payment schemes have gained considerably in popularity over recent years and tend to generate larger numbers of payments overall; many of these are generated automatically through the banks' standing order and direct debit systems and result in minimal involvement of the individual customer.

The hours during which banking services are generally available are somewhat restricted in the United Kingdom and are not convenient to large numbers of the working population. This factor could well have a significant bearing on the method adopted for drawing cash and making payments.

The attitudes of businesses towards the payment mechanisms are more likely to be governed by consideration of cash flow, controllability and costs (both in-house and by way of banks' charges). So far as the banks are concerned, the extent to which a float is created in a particular transfer system can be a significant factor.

The money transmission services provided by the banks throughout the United Kingdom were examined by the Price Commission\*1), which made certain comparisons with the services operated by the banks in a number of other countries. In its Report, published in April 1978, the Commission concluded that: "in terms of speed with which transactions are processed, the degree to which automation is used and their record of innovation, the UK banks were at least as efficient as those of the other countries and in many areas superior". It also concluded that the charges made for money transmission services were not excessive.

## II. CASH PAYMENTS

The right of note issue in England and Wales has gradually been concentrated on the Bank of England through the operation of the Bank Charter Act, 1844. This Act separated the note-issuing function from the Bank's other activities by dividing the Bank into two Departments - the Banking and Issue Departments. The division does not affect the internal organisation of the Bank, but serves for accounting purposes only. The Banking Department operates like any other bank in issuing notes and coin to its customers (which include the other banks) in exchange for reductions in its deposit liabilities to them. The accounts of the Issue Department are related solely to the production, issue and payment of bank-notes and to the portfolio of securities with which the note issue is backed.

The Currency and Bank Notes Act, 1954, empowered the Bank of England to issue notes of such denominations as the Treasury might approve. Bank-notes are currently issued in denominations of £1, £5, £10 and £20 and circulate freely throughout the United Kingdom. However, in Scotland and Northern Ireland the £1 notes only are legal tender. The

three Scottish clearing banks and the four banks operating in Northern Ireland each retain the right to issue their own notes but, apart from a very small fiduciary issue, such notes in circulation must be fully covered by holdings of Bank of England notes, or coin.

The Royal Mint is responsible to the Treasury for the issue of coin throughout the United Kingdom. Coins are currently issued in the following denominations:

Bronze: 1/2, 1 and 2 pence  
Cupro-nickel: 5, 10 and 50 pence

Coins for the equivalent of 5 and 10 pence in pre-decimal currency still circulate, as do cupro-nickel coins for 6 old pence (= 2 1/2 pence).

Under the Coinage Act 1971:

- (a) cupro-nickel coins of denomination of more than 10 pence are legal tender for any amount up to £10;
- (b) cupro-nickel coins of denomination of 10 pence or less are legal tender for any amount up to £5;
- (c) bronze coins are legal tender for any amount up to 20 pence.

The clearing banks draw their requirements of bank-notes from the head office and the seven branches of the Bank of England and distribute them to their branches through their own cash centres. The Royal Mint will send coin to bank cash centres or directly to bank branches. Old notes and those that are surplus to requirements are returned to the Bank of England, where they are taken out of circulation. Coin may not, under normal circumstances, be returned to the Royal Mint in this way and the banks are thus forced at times to store considerable quantities of surplus coin.

The total value of notes and coin in circulation has more than doubled since 1970 and roughly shadowed the rise in the retail price index. There has been a small decline in the value of £1 notes in circulation but the use of £5 and £10 notes has increased considerably. The number of new notes (all denominations) issued each year is approximately 1.7 billion and in 1978-79 the cost to the Issue Department of the production, issue, custody and payment of bank-notes amounted to a little over £24 million. The authorities make no contribution to the capital costs incurred by the clearing banks in establishing and equipping cash distribution centres. Nor do they meet the costs of distributing and holding cash within the banks' branch networks throughout the country. Despite attempts by the banks to minimise transport costs and reduce cash levels, an average of £779 million in notes and coin was held by the London clearing banks throughout 1978.

The life of bank-notes has tended to fall steadily in recent years. Their present average life (compared with 1971 in brackets) is as follows:

## United Kingdom

£ 1	9 months	(11 months)
£ 5	15 months	(20 months)
£10	25 months	(25 months)

The Payment of Wages Act 1960 relaxed the previous legislation governing the payment of manual workers' wages and made it possible for these to be paid, with the individuals' agreement, direct to a bank account or by postal order or by cheque. Employers in the United Kingdom continue to seek agreements with their employees at all levels in efforts to reduce the administrative and security costs of wage and salary payments. However, the convenience of receiving such payments all or part in cash remains attractive to many individuals.

### III. PAPER-BASED PAYMENTS

The paper clearing system in London, which originated some time prior to 1770, has evolved gradually over the years to meet the changing requirements of bankers. Throughout the nineteenth century the exchange of cheques, in a building set aside for the purpose, was controlled by a Committee of Bankers and membership of the Clearing House became a matter of importance and prestige. A number of country bankers amalgamated with London bankers with the sole object of obtaining a seat in the Clearing House.

A private company, The Bankers' Clearing House Limited, was formed in 1895 for the purpose of acquiring and managing the Clearing House. The stock in this company was originally held by the nineteen members of the Clearing House, but the position has been affected over the years by various amalgamations and the stock is now held in unequal proportions by the six members of the Committee of London Clearing Bankers. Apart from these six banks, the Bank of England participates directly in the clearing system by virtue of its associated membership of the Bankers' Clearing House. It also acts as the settlement bank but does not control the clearing operations. The Co-operative Bank and the Central Trustee Savings Bank have now joined in the exchange of clearings but take no part in the administration of the Clearing House.

The paper passing through the Clearing House is divided into three categories; town clearing and general clearing for debit items such as cheques and bankers' payments; and credit clearing for credit transfers.

The Town Clearing is restricted to cheques for £5,000 or more and other claims (e.g. maturing bills of exchange) drawn on and paid into the Bank of England and the 100 or so branches of the clearing banks within the central area of the City of London. It provides a same day settlement service effectively covering all the financial operations of the City, including the banks, the Stock Exchange, insurance companies, shipping companies and other financial institutions. All cheques passing through the Town Clearing must be paid or returned unpaid on the same day.

More than ten million cheques are now (early 1980) received by the 12,000 branches of the clearing banks each working day. These are sent to the head office clearing departments for collection and passed through the General Clearing in the Clearing House on the second day. The cheques are received by the branch on which they are drawn on the day following exchange in London and settlement is effected on that day. Returned items are sent through the post to the branch where they were lodged and the value adjusted by means of a claim made through the automated clearings.

A high degree of automation has been achieved in the debit clearing. Over 1,216 million articles, including dividend warrants, were passed through the Clearing House during 1978 and some 4.5 million of these were in the Town Clearing. The average value of cheques in the General Clearing was £249, compared with over £570,000 per item in the Town Clearing.

The credit clearing, also known as the bank giro, which can be used for transferring funds whether or not the remitter has an account, is not yet automated although initial steps are now being taken in this direction. Some 180 million items (average value £205) passed through this clearing during 1978.

The clearing systems have their own rules but these do not have the force of law.

Subsidiary clearing systems are operated in Scotland and Northern Ireland but they deal with rather fewer items. There is also a small local clearing in Liverpool to deal with the high-value cheques resulting in part from the dealings of the provincial stock exchange in that city.

Non-clearing banks traditionally cleared their paper through a "Walks" Clearing (exchange of paper by hand of messenger) and settled by means of a draft drawn on a clearing bank (bankers' payment). In view of the increase in the number of non-clearing banks and the higher volume of cheques to be handled, this work is now routed through the General Clearing. Under this arrangement each non-clearing bank must have an agency arrangement with a member of the Clearing House.

A small number of government departments, principally the Paymaster General's Office, make payments by means of payable orders drawn on themselves. The banks present these centrally either to the department concerned or to the Bank of England and settlement is effected by means of a voucher drawn on an account at the Bank of England.

The UK banks have issued some 10 million cheque guarantee cards to their customers excluding Barclaycard (Visa) which doubles as a cheque card and credit card. These enable the holder to encash a cheque for up to £50 at most banks in the United Kingdom and two such cheques at many banks on the continent of Europe. The cards also guarantee the payment of a cheque issued by a card-holder in respect of goods or services up to £50 subject to certain conditions.

Travellers' cheques, issued by banks and other bodies, and denominated either in sterling or in foreign currencies, are widely used as a

## United Kingdom

safe and convenient method of taking currency abroad. Travellers' cheques are probably negotiable instruments by the law of the United Kingdom but they do not come within the scope of the Cheques Act 1957. No statistical data are available for these items.

London's position as an international financial centre means that institutions in the City handle a large volume of payments in foreign currencies. This has led to the creation of a special US dollar clearing operation in London for "retail" payments and the banks are currently examining the need for a "wholesale" dollar clearing service.

Postal orders, which may be bought and cashed at post offices, are a particularly convenient method of making low-value payments. However, their use has been declining in recent years, mainly owing to the use of agents by betting companies (e.g. football pools' promoters) for the collection of coupons and stakes. Some 170 million postal orders were issued during 1978, representing about 5 per cent. of non-cash payments.

Order books issued by the Department of Health and Social Security contain a number of "foils" which may be used to draw cash periodically at a specified post office. Some 1,000 million foils were used for social security benefits during 1978 (although paper-based, these are in effect payments by Government in cash and are not generally included in cashless payment statistics).

## IV. PAPERLESS PAYMENTS

The clearing banks in the United Kingdom have extensive computerised branch networks which enable them to carry out intra-bank transfers within the same system and with the minimum amount of paper movement.

During the 1960s the banks were holding substantial numbers of standing order payments on their own computers, printing out hundreds of thousands of paper credit transfers each day for delivery to other banks which then had to recapture the data for processing on their own computer. It was thus decided to set up the Inter-Bank Computer Bureau in 1968 for the exchange of composite magnetic tapes.

A separate company, Bankers Automated Clearing Services Ltd. (BACS), owned by the five largest London clearing banks, was set up in 1971 to further the work of the original Inter-Bank Computer Bureau and this has now become the world's largest automated clearing house. The Bank of England and the Scottish banks contribute to the financing of BACS Ltd., and participate in its operation, as do the Central Trustee Savings Bank and the Co-operative Bank.

BACS processed some 338 million items during 1978, of which 41 per cent. were standing orders, 21 per cent. other credit transfers including salary payments, and 38 per cent. were direct debits. There has been a relatively steady evolution in the use of BACS, with the volume of items



processed rising by the order of 13 per cent. per annum from 1969 to 1978 and the monthly value more than doubling to about £5 billion between 1974 and 1978.

Non-clearing banks, including the National Girobank, have agency arrangements with BACS and customers sponsored by a clearing bank may present their magnetic tapes direct to BACS. There are now more than 4,200 non-bank users.

Although the BACS system is primarily for the transfer of funds by electronic means, there are instances where the recipient is, for one reason or another, unable to receive transfers in computer media. On these occasions BACS produces paper vouchers. Only about 3 per cent. of the payments have to be produced in this way.

Whilst tapes have to be submitted to BACS two days before value date, in order that the necessary processing may be carried out, the cycle of operations is such that all debit and credit records and their respective contra records reach destination accounts on the same day. Settlement between banks on that day is effected in the books of the Bank of England.

#### V. CURRENT DEVELOPMENTS

The English and Scottish clearing banks, together with the Bank of England, the Central Trustee Savings Bank and the Co-operative Bank, have for some years been working on a system known as Clearing House Automated Payment System (CHAPS). This system was designed to allow automated sterling payments to be made between banks with same-day settlement through a central computer installation. It was intended initially to supplement, and perhaps ultimately replace, the existing Town Clearing.

However, technological progress has led the banks to conclude that this system based on a central computer is not likely to be best for their needs in the 1980s. The banks are urgently reappraising their objectives and looking at ways of harnessing technological developments against a background of developments in payment systems generally and user requirements. It is still the intention that work will continue with the automation of interbank payments.

There has been a considerable growth over recent years in the number of items passing through the credit clearing, and there are now more items in the credit clearing than there were in the debit clearing when the first steps were taken towards automation. Active consideration is therefore being given to the full interbank automation of the existing paper credit clearing system in conjunction with the progressive truncation of paper items.

Consideration is also being given by some banks to the possibility of reducing the movement of paper in the debit clearing, such as by use of image processing techniques accompanied by cheque truncation.

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The banks are also engaged in studying the practicalities and viability of providing a national point-of-sale system which would link cashpoints in retail stores to the banks' computers.

In the international sphere UK banks have already made extensive use of SWIFT and it is likely that the interfaces between their SWIFT operations and domestic transfers will become more automated.

### VI. OTHER PAYMENT FACILITIES

The National Girobank offers centralised banking facilities to its customers through 21,000 post offices and via the postal system. In the ten years since its opening the Girobank has attracted nearly 640,000 customers. Of these, all but about 30,000 are personal customers.

In 1978 the Girobank handled over 260 million transactions (including cash transactions) worth around £70 billion. At the interface with the banking systems, the Girobank sends bank cheques to the clearing to an annual value of some £3 billion and receives giro cheques from the clearing to a value of some £5 billion. It is not itself a member of the Bankers Clearing House, but has agreed clearing procedures with the banks. The Girobank also exchanges magnetic tapes with BACS.

A number of major retail organisations, local authorities and public utilities receiving large numbers of payments use the Girobank's money transmission services and thus provide the Post Office with substantial sums of cash. As the Post Office pays out considerably more cash than it takes in, particularly by way of social security payments, the growth of these Girobank services cuts down the physical movement of cash.

The National Savings Bank also operates passbook accounts over post office counters. Deposits in ordinary accounts may be withdrawn on demand or at short notice and deposits in investment accounts are subject to one month's notice of withdrawal. Deposits may be in cash or cheques drawn in favour of the account-holder. Withdrawals may be in cash or by warrant drawn by the NSB. It is not possible for customers to make payments direct from these accounts.

Building societies in the United Kingdom have extensive in-house computer branch networks. They provide interest-bearing deposit facilities but do not offer direct payments services to their customers. The societies themselves use the banking system for money transmission.

Credit cards are widely used for consumer payments. The two domestic credit card systems are Barclaycard (affiliated with Visa) and Access, which is owned by a consortium of banks and is linked with Mastercharge. Some 8 million cards are currently issued and about half of these are used regularly. Credit cards are estimated to account for 4 per cent. of all non-cash payments. Many large stores have also instituted (or are considering instituting) their own credit card schemes, such as

budget accounts, and there are over 100 such schemes now in existence in the United Kingdom. These schemes are usually administered by one of the major credit card companies.

Over 2,000 cash dispensers have now been installed by the British banks. About 60 per cent. of these are available throughout the day and night and capable of both off and on-line operations. The number of cash dispensers and banking terminals used by the British banks is growing at a significant rate.

Footnote

- \*1) A government agency then charged with responsibility to survey prices in general and undertake specific investigations as necessary but since disbanded.



11. U N I T E D   S T A T E S



I. INTRODUCTION

The constitutional power to control and regulate the quantity and character of all money rests with the US Government\*1). The nation's official money consists of coin and paper currency which are, by constitutional authority, legal tender for all debts, public and private. The Federal Government is the sole issuer of coin and currency, which are warehoused and distributed by the Federal Reserve banks to commercial banks that, in turn, make this money available to the public. Unneeded or unfit coin and currency are returned to the Federal Reserve banks for recirculation or destruction.

Three-quarters of the money used for 90 per cent. or more of the nation's payment transactions takes the form of demand deposits at commercial banks which are accessible by cheque or converted into cash through various means of withdrawal\*2). Transfer of demand deposit balances by cheque has developed over the years as the prevailing method used for paying bills, disbursing wages and salaries and settling transactions between firms. In 1978 debits to demand deposit accounts of individuals, partnerships and corporations totalled US\$ 40,372 billion. Most of these were initiated by an estimated 32 billion cheque transactions. In recent years, negotiable orders of withdrawal (NOW) account balances at commercial banks, mutual savings banks, and savings and loan associations, and share draft accounts at credit unions have begun to be used in much the same manner as demand deposit balances at commercial banks.

Commercial banks provide most of the processing and accounting services for demand deposit transfers, although the Federal Reserve banks provide interbank clearing facilities for somewhat less than one-half of the cheques written. Non-bank depository institutions, savings banks, savings and loan associations, and credit unions (co-operative banks) have in recent years begun to offer money transfer services into and out of savings accounts.

Because neither cash nor cheques are suited to every type of transaction, several intermediate methods for payments have evolved. Credit cards and travellers' cheques, for example, are used by many consumers because, in contrast to cash, protection is afforded against loss or theft and, in contrast to cheques, they are more widely acceptable for payments made at the point of purchase. Money orders, cashiers' cheques and similar instruments are purchased like travellers' cheques and are used as a substitute for cheques by persons who do not have chequing accounts. By contrast with the situation in many European countries, the US Postal Service plays a small part in providing payment services, its rôle being limited to the sale of money orders. Several private firms and banks also sell money orders, and others issue travellers' cheques.

Customers are now being offered electronic transfer of funds as a substitute for cash, cheques, credit cards, travellers' cheques, money orders and other means of payment. This paper briefly describes the various payment media used today and the organisations that provide the

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services, as well as current developments in the field of electronic funds transfer (EFT).

Some quantitative orientation is needed at the outset to summarise essential features of the US payment system in absolute and relative terms. The table below shows the importance of money stocks to their holders and to the major providers of money services, i.e. governments and depositary institutions (see also Table 1).

Year	Currency in circulation		Demand deposits		
	Billions of dollars	% of GNP	Billions of dollars	% of GNP	% of commercial bank assets
1978	93.2	4.4	258.4	12.3	19.1
1975	71.0	4.6	218.5	14.3	23.3
1970	47.7	4.9	166.8	17.0	31.2
1965	35.3	5.1	131.8	19.2	37.2
1960	29.0	5.7	114.5	22.6	47.2
1955	27.6	6.9	106.8	26.7	53.6

The historical perspective, 1955-78, indicates a strong trend towards more efficient utilisation of both currency and demand deposits. Currency in circulation relative to gross national product (GNP) has declined by 35 per cent. (from 6.9 to 4.4 per cent. of GNP). Demand deposits have declined even more, by 54 per cent., from 26.7 to 12.3 per cent. of GNP. This decline can be partially attributed to increases in money's efficiency and to the use of savings and other types of deposit accounts for funds transfer purposes.

Other significant trends are evident in the relative importance of money provided by banks and by the Federal Government. Demand deposits in 1978 were equivalent to less than 20 per cent. of commercial-bank assets, whereas in 1955 they amounted to 54 per cent. The Federal Government's stake in interest-free loans - if measured by currency in circulation relative to Treasury debt held by private investors - has been greater in the 1970s than it was in the late 1950s and in the 1960s, because growth in currency usage has been greater than the growth in government debt.

## II. ROLE OF GOVERNMENT

Government participation in supplying payment services is relatively limited. The Department of the Treasury is responsible for the printing of currency and the minting of coin, and the Federal Reserve performs a wholesaling rôle, distributing cash to banks and retiring unfit coin and currency. The costs for these Treasury and Federal Reserve functions are less than the costs borne by commercial banks for distributing and warehousing cash for consumers and businesses, if



insurance, safe-keeping, processing and transport costs are taken into account. In addition to the Government's primary rôle in meeting the nation's currency requirements, the Federal Reserve provides interbank cheque-clearing facilities and expends less than 5 per cent. of the total resource cost of cheque payment borne by financial institutions\*3).

Regulatory requirements and banking supervision, to which banks and other depositary institutions are subject, have both specific and environmental influences on the payment system. Law, regulation and supervision are the means used to prevent payment techniques that may jeopardise the safety and soundness of the banking system or threaten the rights of users. In addition, State and Federal laws may constrain the activities of depositary institutions by limiting their office locations or imposing rules on the types of deposit accounts that may be used for payment purposes. Under the Uniform Commercial Code (UCC), State laws set forth rights, liabilities and obligations governing the use of paper transfers. The recent Electronic Fund Transfer Act established similar ground rules at the Federal level for electronic funds transfers.

### III. ROLE OF DEPOSITARY INSTITUTIONS

The US banking system is widely known for the large number of constituent and, in the main, independent banks. There are 14,500 banks, or 66 per one million persons. Some 2,000 of these banks are subsidiaries of 300 multi-bank holding companies. Many of the smaller independent banks use clearing, data-processing, portfolio, credit and other services supplied by large correspondent banks. 80 per cent. of the nation's banks have assets of less than \$50 million and, in the aggregate, account for 18 per cent. of total assets. At the other extreme, just under 1 per cent. of all banks - those with assets in excess of \$1 billion - have assets equal to 48 per cent. of the total. The middle-sized group is made up of 19 per cent. of the banks with 33 per cent. of assets\*4).

The large number of banks in the United States is a consequence of a dual chartering system in which each State is empowered to charter banks operating within its boundaries, and, in addition, the Federal Government can charter a bank in any State. The rules regarding the branching activities of banks are also set at both the State and the Federal level. The cumulative effect of these laws is to restrict the ability of banks to branch. As the Federal Government places the same constraints on branching by nationally chartered banks that State laws impose on State-chartered banks, banks are prohibited from having full-service offices in more than one State. Often a State will limit branching to a particular city or country. A few States prohibit all full-service branching.

These structural features of the commercial banking system have had a strong influence on the evolution and character of the machinery for clearing deposit transfers and have resulted in the Federal Reserve System being assigned cheque-clearing responsibility by the Congress in the Federal Reserve Act (see Appendix I). These features continue to

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provide a public-service rationale for a Federal Reserve clearing rôle. Considering the country's size and the number of banking organisations, there is no feasible alternative for clearing open to the vast majority of banks if they are to be able to offer money services competitive with those that very large banks can make available. The Federal Reserve provides the same services to all banks, large and small. Its "value dating" ranges from the same day it receives an item for collection to a maximum of two days. This time schedule encompasses any two institutions in the entire nation and sets the clearing standard for all banks. Federal Reserve clearing is the prevailing intercity method of collection for all cheques except those of large dollar value.

The evolving Automated Clearing House (ACH) system, which embraces service not only to commercial banks but to savings and co-operative banks as well, is the most recent example of a recognised need for a public presence in the clearing of payments among 14,500 banks and 30,000 other depository institutions.

There are, however, growing trends and developments in sight that may modify the Federal Reserve's rôle. The banking structure itself is changing; branching restrictions are being relaxed and multi-bank holding companies are breaking down barriers in unit banking States such as Texas\*5).

To some degree, reductions in the number of banking organisations and the consequent displacement of interbank clearing transactions by "on-us" items are being offset by the growing participation of savings and co-operative banks in payment services. If the rôle of these institutions in serving consumer needs tends to displace similar services by commercial banks, the effect of greater concentration in the commercial-banking structure on Federal Reserve clearing activity will probably be neutralised, depending upon the clearing patterns that evolve from transactions originated by or terminated at these savings and co-operative banks.

Other influences on Federal Reserve clearing activity, such as the centralisation of data processing and the evolution of communications technology, are harder to assess. Although electronic data processing makes economies of scale possible and has resulted in large volume gains for skilled bank and non-bank processors, technology can also facilitate dispersed processing. Whether the nation's payment system will shift towards dispersed processing will depend on transmission costs for transaction data and information. At present, centralised systems are used by nearly all large banks for their in-house systems. Some of the largest banks, such as those in California whose branching networks cover distances of 1,000 miles, may have no more than one or two centres. They do not consider dispersed branch-office processing to be to their advantage.

In those sections of the country where large branch banking systems are pervasive, concentration of cheque processing and the increased frequency of "on-us" items reduce the clearing rôle of the Federal Reserve. In the San Francisco Federal Reserve District, for example, the number of items processed relative to demand deposits of individuals,

partnerships and corporations (IPC) ranges from one-quarter to one-half of the number handled by most of the other districts\*6).

Recent developments in banking law and an amendment to Regulation Q adopted by the Federal Reserve Board on 1st May 1978 (effective 1st November 1978), permitting automatic transfers from savings to demand deposit accounts to cover overdrafts, raise the possibilities of significant changes in the pricing of payment for services by banks and a fully competitive rôle for non-bank depository institutions. Automatic transfer service (ATS) links demand and savings deposit accounts of individuals at commercial banks in such a way that the combined account is equivalent to an interest-bearing demand deposit. In less than a year - as at July 1979 - balances in automatic transfer accounts grew to \$6.8 billion. In addition, interest-bearing NOW accounts in New York and New England have reached \$3.4 billion, and share draft accounts at credit unions \$0.9 billion. Interest-bearing transaction accounts totalling \$11.1 billion at all types of depository institutions are not impressive compared with the mid-1979 demand deposit component of M1, namely some \$270 billion. However, as only 35 per cent. of demand deposits are held by consumers, the proper basis is \$95 billion, which compared with \$11.1 billion is impressive.

Table 2 provides the quantitative background for this development by showing the relative magnitudes of demand, savings and time accounts at all types of institutions doing depository business in the United States. It is quite apparent that a general practice of making savings deposits eligible for a payment rôle could have a major impact on the monetary aggregates as well as on the competitive environment in which depository institutions operate.

The use of savings account balances for payment purposes is an innovation in US payment practice. Hence, it is too early to forecast how pervasive such arrangements may become or the kinds of limitations that regulation or banking practice may impose on such use of savings accounts. Limitations based on frequency, size or type of transfer are possible. Pricing arrangements have already come into use, generally within the following ranges: monthly maintenance fees (\$1-\$6); activity fees (10c-25c); or balances (minimum or average) of \$300-\$3,000.

#### IV. CIRCULATION OF COIN AND PAPER CURRENCY

One of the basic purposes of the Federal Reserve Act that was passed by the Congress in 1913 was to provide for a more elastic currency. In the two decades preceding passage of the Act currency shortages had on several occasions led to or aggravated stresses in the banking system, some of which resulted in financial panics. The creation of the Federal Reserve System provided a method of responding fully to variations in the public's money needs by making coin and currency available at the times and in the quantities demanded. After this policy was put into effect the amount of coin and currency in circulation assumed a pas-

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sive rôle, and monetary control was achieved by controlling bank reserves and deposit money.

Today, the nation's requirements for currency and coin are supplied to the Federal Reserve System by two bureaux of the Department of the Treasury. Currency is printed by the Bureau of Printing and Engraving and is supplied to the Federal Reserve at cost. Currency in the amount of \$26.8 billion was purchased from the Bureau of Printing and Engraving in 1978 at a cost to the Federal Reserve of \$58.8 million. Currency held by the Federal Reserve at the end of the year amounted to \$9.5 billion, compared with \$99.1 billion in circulation\*7).

Coin is produced by the Bureau of the Mint and placed on Treasury books at face value. Seigniorage is reflected as a reduction in the Treasury's net budget deficit or as an increase in the surplus. In the fiscal year ending 30th September 1978 the Mint produced 12.1 billion coins at an operating cost of \$40.7 million. Cost of metal was \$78.9 million and seigniorage was \$367.2 million. Coin is acquired by the Federal Reserve from the Mint at face value. In 1978 the Federal Reserve purchased \$644 million worth of new coin; its stock of coin at the end of the year was \$274 million, compared with \$10.7 billion in circulation outside the Treasury and the Federal Reserve.

The flow of currency and coin through the Federal Reserve offices is illustrated in Table 3. The amount of currency and coin in circulation at any point in time depends primarily on the transaction needs of the public. These needs peak and ebb around holidays, and banks may return surplus holdings to Federal Reserve offices depending on whether the cost of doing so outweighs the cost of safekeeping a non-earning asset and the income forgone from holding a marketable security. The Federal Reserve does not pay incoming costs, but pays for delivery to banks or, in the case of large banking systems, to storage sites.

### 1. Denominational structure and use

The basic denominational structure of US notes dates from 1862, when notes in denominations of \$1, 2, 5, 10, 20, 50, 100, 500, 1,000, 5,000, 10,000 and 100,000 were authorised. Notes of \$500 and \$1,000 are no longer printed and those of \$5,000, 10,000 and 100,000 are no longer used. The \$2 denomination was discontinued in 1966 and re-issued in 1976.

### 2. Demand for currency and coin

Several factors have affected the demand for coin and currency in recent years, including inflation, increase in turnover, competition from other methods of payment, and foreign demand for US currency. The so-called "underground economy" - transactions involving the use of currency for tax evasion, illicit operations or a desire to maintain financial secrecy - has also had an impact.

The net influence of each of these factors cannot be isolated, but some inferences can be drawn by converting current dollars into constant

dollars, relating outstanding currency and coin to GNP and differentiating among denominations. The results of these conversion operations are shown in Table 4.

In the 1960s prices measured by the consumer price index rose by 31 per cent.; real GNP by 46 per cent.; and currency in circulation by 62 per cent. The rise in currency was sufficient to accommodate the increase in prices, but not both the increase in prices and output as measured by GNP. It is reasonable to infer that the nation resorted to other means of payment and that a more efficient use of currency was also involved.

Fairly similar trends are discernible in the 1970s. But inflation rose more than twice as fast as real GNP (by 68 per cent., compared with 29 per cent.) and currency grew at an accommodative rate of 99 per cent.

The behaviour of currency denominations in these two periods is more illuminating than that of the aggregate (Table 5). Smaller-denomination bills (those of \$1, 2, 5 and 10) have become less important, declining between 1960 and 1978 from 34.5 to 19.3 per cent. of total currency. Their transaction rôle has been shifting to larger denominations as a consequence of inflation. The \$20 bill, on the other hand, has maintained a steady position at 35 per cent., as its active transaction uses grew and its low-turnover uses shifted to \$50 and \$100 denominations. These larger denominations, which in 1978 comprised 45 per cent. of currency in circulation, are being predominantly utilised in low-turnover situations and where smaller denominations are not as convenient. While it seems clear that inflation has brought notes of larger denomination into greater use and that larger notes have to some extent displaced small-denomination notes, it does not appear likely that ordinary transaction use could have produced the very large increases in the circulation of \$50 and \$100 notes. Rather, such increases can more probably be attributed to continued foreign demand for US notes and perhaps also to the varied reasons for avoiding the use of deposit transfers as a method of payment because of the ensuing audit trail.

Some of the foregoing inferences are supported by the relationship between currency issued and unfit currency redeemed for the various denominations. These data are somewhat variable from year to year for reasons related to Federal Reserve and Treasury operations (that is, inventory policies, productivity problems and fitness standards), but for present purposes the variations are not significant. The proportion of unfit currency to new bills issued is about 90 per cent. for small denominations (under \$20). But in 1978 the proportion for \$20 bills was 68 per cent.; for \$50 bills 46 per cent.; and for \$100 bills 22 per cent. While these proportions reflect growth in the demand for larger denominations, they also indicate longer life for such bills, which is an indication of less frequent and less wearing use.

The large rise in fractional coin, particularly in the 1960s, appears to reflect the expansion in the use of coin meter and vending machines.

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### 3. Recent developments

In 1972 the Federal Reserve initiated contracts with three companies for the development of a machine that would automatically verify the count accuracy of currency deposits, check each note for authenticity, denomination, and fitness, restrap fit notes in multiples of one hundred and destroy unfit notes by shredding. After six years two viable high-speed currency systems have been produced at a development cost of approximately \$4.9 million\*8).

In July 1979 the Bureau of the Mint released a one-dollar coin for circulation in the expectation that public acceptance would reduce the use of the \$1 bill, which, because it is expensive to produce and has a short life, is less efficient from the point of view of the Treasury and the Federal Reserve.

## V. CHEQUES

The payment system of every country has one or more dominant characteristics. The US system is widely known for its dependence on the cheque as a method of transferring deposits. However, without the seldom-noticed infrastructure for clearing cheques, the cheque would not be a viable payment instrument in the United States because of the country's size and the large number of banking institutions. Any widely used deposit transfer system must be able to move funds expeditiously between any two of 115 million accounts located in 14,500 commercial banks. That infrastructure includes transport facilities, clearing and settlement arrangements between institutions and a pattern of carefully defined legal rights and responsibilities for all participants.

81 per cent. of the nation's families have chequing accounts. In 1978 these families, corporations and governments together wrote 32 billion cheques. Although a recent profile of cheque writers and recipients is not available, it is not likely to be much different from one developed by the Bank Administration Institute in the late 1960s\*9). At that time, individuals as payers wrote 52 per cent. of the cheques, corporations 46 per cent., and governments 2 per cent. As payees, individuals received 43 per cent. of the cheques written, businesses 55 per cent., and governments 2 per cent. The payment patterns among these categories of cheque users indicated that 70 per cent. of the cheques written by individuals were to businesses, 28 per cent. to other individuals, and 2 per cent. to governments. Of the cheques written by corporations, 58 per cent. were to individuals, 40 per cent. to other businesses, and 2 per cent. to governments.

The same study, which also covered cheque handling patterns at commercial banks, reporting that of total cheques deposited over the counter or by mail, 30 per cent. were "on-us" items, 24 per cent. were cleared locally, and 46 per cent. were cleared through correspondents or the Federal Reserve. The comparative magnitude of these flows has probably shown some secular change in the past decade. A more significant

fact is that regional variations related to banking structure and the centralisation of cheque processing give rise to considerable diversity in the way cheques are handled and cleared.

Banks of first deposit typically segregate cheques for large amounts and subject them to special expedited handling and delivery in order to obtain earlier funds availability. Depending on the volume of items to be collected, the sorting the bank is willing to perform, the accessibility of transport and other environmental factors, the bank of first deposit ordinarily has more than one collection alternative except for the "on-us" items and, ordinarily, local clearing items. Intercity cheques can be routed to correspondent or non-bank processors competing for this business, or can be sent directly to the Federal Reserve. Most volume processors channel cheques they cannot clear among their bank customers to the Federal Reserve for presentation to all other paying banks. The net result of these arrangements is that inter-area items, except those for large amounts, directly or indirectly use the Federal Reserve clearing system.

One of the serious operational flaws of the cheque system is the large number of uncollectable transfers it generates. In 1978 the number of returned items is estimated to have been some 300 million of the 32 billion cheques presented for payment. The primary reason for a returned item is insufficient funds in the account on which the cheque is drawn. In addition, cheques may also be returned for lack of a signature or proper endorsement, or because the funds in the account have not as yet been collected or the cheque cannot be handled through normal collection channels. Under the provisions of the Uniform Commercial Code and the Federal Reserve's Regulation J, a payer's bank must initiate return of an item no later than midnight of the banking day following the day of presentation in order for the return to be considered valid and not an obligation of the payer's bank itself.

Returned item processing is costly and labour-intensive. The cheque flows backwards through the clearing system, with manual inspection of each endorsement in order to reverse all previous provisional credits. In 1978, for example, the cost per item returned at Federal Reserve offices alone was 5.5 cents, compared with 0.9 cents for each cheque processed as a payment. Efforts are under way to standardise and to develop machine-readable endorsements in order to improve the processing of returned items. However, more cost-effective remedies would avoid the necessity to abort the transaction. These include the use of overdraft credit lines, automatic transfers from savings to chequing accounts, and the deterrent effect of fees of \$3 to \$10 per item levied by banks and merchants on customers who overdraw their accounts.

1. Federal Reserve clearing procedure

The Federal Reserve in 1979 maintained 48 cheque-clearing centres that processed more than 50 million items per working day. Cheques and cheque-like instruments are deposited by banks that are members of the Federal Reserve System. Among the cheque-like documents are the "NOW account" drafts for thrift and commercial-bank institutions, the "share

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drafts" for credit unions, and the "payable-through drafts" used by corporations. Non-member banks may deposit items through a member bank or, if drawn on a bank in the same region, directly with the Federal Reserve.

Federal Reserve offices use some 200 high-speed sorters, of which there are as few as one in four locations and as many as twelve at the largest office. About 3 per cent. of cheques are rejected by these high-speed processors and are sorted manually. The forty-eight Federal Reserve offices have installed 200 high-speed sorters.

The Federal Reserve's clearing activity is determined by the volume of items delivered to its regional offices by depositing banks. As the US banking system includes a large number of widely dispersed institutions varying greatly in size, a broad range of processing alternatives is required to accommodate the timing, condition and volume of cheques each forwards to or receives from the Federal Reserve.

In recent years the growth of bank and non-bank processing centres has greatly increased the efficiency of the clearing system by providing a high percentage of magnetic-ink encoded items and a larger number of destination sorts. For example, in 1978 more than 50 per cent. of the items received by the Federal Reserve were from 400 bank or non-bank processing centres, most of which handled at least 25,000 items daily and used contemporary electronic processing techniques.

Table 5 summarises Federal Reserve clearing activity for the Government and the banking system since 1955. As the Government's banker, the Federal Reserve handles payments to the public. Increases in this activity since 1955 have been modest (44 per cent.), and the average size of a government payment in 1967 dollars has remained close to \$300.

Commercial cheque volume ("other" in the table), on the other hand, has risen sharply. In 1978 the number of cheques handled was 5.4 times the 1955 volume, and, on a per capita basis, the number was 4.3 times as great. But the increase in dollar volume adjusted for inflation - as a percentage of GNP - was only 1.5 times as much. The average value of a cheque in constant dollars actually declined from \$438 to \$258. The reason for the divergence in the number of cheque items and the growth in payment volume is that large-value cheques, for the most part, are cleared outside the Federal Reserve because earlier availability can be secured by using special courier services.

The Federal Reserve credits depositing banks with funds in accordance with the Reserve banks' "availability schedules", and charges an institution for an item on the day it is presented to the paying bank. The availability schedule reflects the Federal Reserve's experience as to the time normally required to present items and receive payment from the banks on which the cheques are drawn. Under regular schedules, credit for a cheque deposited at a Federal Reserve office may be given on the day of deposit, the following day, or the day after that, depending upon the time of day the cheque is deposited, the location of the paying bank, the condition of the cheque, and the degree to which the item has been pre-sorted by the depositing bank. The only cheques that can generally be



credited on the same day (and then only if the bank is relatively near a Federal Reserve office) are those that are drawn on the Federal Government or on a reserve account at a Federal Reserve bank and are deposited by 4 p.m. Cheques that are drawn on banks in the same region can generally be deposited at the close of business, with credit given the next day. Normally, cheques drawn on banks in a different region are credited two days after they are deposited. However, banks can pre-sort items drawn on banks in those out-of-region cities that have Federal Reserve offices and, using expedited courier services including the Federal Reserve's air charter service, can receive credit for these items the next day.

To assure the rapid delivery of cheques between Federal Reserve offices, the System utilises an air charter service, commercial airlines and other air courier services. The delivery of cheques from Federal Reserve offices to financial institutions is effected almost exclusively by contracted courier services, except for items to remote locations that are sent via the US Postal Service. Cheques that are cleared by the Federal Reserve are settled through the reserve accounts of member banks. Cheques cleared outside the Federal Reserve are settled through the reserve accounts of member banks or through correspondent bank accounts.

#### VI. ELECTRONIC FUNDS TRANSFERS

Electronic funds transfer systems have been under development in the United States since the late 1960s; those now in operation involve participation by both the private and the public sector and make use of a wide range of technology. Among these systems, the automated clearing house (ACH) offers the greatest potential for displacing cash and cheques in making payments. ACH coverage is now nationwide and automated credit and debit transfer services are available for use by all depository institutions. At the end of 1978 payment volume through the ACH network was at an annual rate of 150 million transfers. Although this volume is relatively insignificant when compared with 32 billion cheques, ACH facilities have the capacity to compete with cheque-usage volumes.

Also coming into widespread use are the automated teller and cash-dispensing machines, which offer an alternative to paying and receiving tellers at banks. Nearly 10,000 machines were in use in 1979 - a substantial number by comparison with the 90,000 offices of depository institutions in the country.

Although there has been a great deal of interest in point-of-sale (POS) terminals, most of the proprietary or co-operative systems put in place, primarily by financial institutions, have not achieved sufficient volume to be viable and many have been abandoned.

There are three specialised wire funds transfer services available to banks. The Federal Reserve Communications System (Fed Wire) and Bank Wire have offered wire transfer services for several decades. A third system, Clearing House Interbank Payments System (CHIPS), operated by

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twelve New York City Clearing House banks, handles international payments. These systems have benefited from recent technological developments and further improvements are expected as a result of advances made in data-processing and transmission technology.

### 1. Automated Clearing House

The Federal Reserve operates thirty-seven of the clearing and settlement facilities for ACH associations; the financial institutions in New York operate their own. The New York facility, however, makes use of Federal Reserve delivery and settlement facilities. The Federal Reserve clearing and settlement facilities, the ACH associations around the country, and the National Automated Clearing House Association make up the infrastructure for handling automated payments in the continental United States. The members of the ACH associations include 9,700 commercial banks and 2,200 thrift institutions; all of these receive payments, while about 200 initiate payments for business and government customers.

Until recently the number of corporations, local governments and other entities using the ACHs for making payments was relatively small. However, the number is growing rapidly and now totals about 7,000.

The coverage and flexibility of ACH transfers were improved considerably in 1978 by linking the ACH facilities into a network providing automated clearing and settlement capabilities throughout the country. The improvement of funds availability and deposit deadline schedules by use of telecommunications instead of the physical transport of magnetic tapes will further broaden the range of potential users. The number of data transmission links between Federal Reserve offices and banks or groups of banks in late 1979 stood at twenty-five serving sixty-seven depository institutions. It is estimated that fifty more will be added in 1980. As few as 400 arrangements of this type will have a major impact not only on the volume of electronic transfers but also on the certainty, speed and reliability of the delivery of payment information.

ACH activity in 1979 was dominated by government payments, which accounted for about 80 per cent. of total dollar volume. Government transactions cleared through the ACH mechanism are credit payments such as social security benefits, salaries and wages, pensions and revenue-sharing payments. The Government's aggressive programme to convert its cheque disbursement system to direct deposit through the electronic funds transfer system, begun in 1976, has been very successful. The rate of participation by payees in established programmes is 25 per cent. overall and runs as high as 50 to 75 per cent. in certain geographical regions.

The private sector uses ACH facilities primarily for salary and wage credits, and for pre-authorised consumer payments for insurance premiums, mortgage loans and other recurrent payments.

Because the ACH method of making payments is new and flexible, its capability is still being adjusted to the payment environment. For example, the National Automated Clearing House Association adopted rules and formats for batched customer-initiated entries that have encouraged

financial institutions to use the ACH for new types of customer-initiated payment, including (1) transactions via automated teller machines when two or more financial institutions share the machine, (2) items created by telephone bill payment services, and (3) transactions emanating from point-of-sale systems.

A major potential application of ACH transfer is linked to various proposals for cheque truncation. The interest of the banking community in substituting a monthly statement for the return of the cheques as proof of payment has been growing as postage and handling costs continue to rise. Various truncation proposals are being studied; those that have general application involve capture of the data on the cheque into an ACH format. Several operational problems are involved in truncation but the three receiving the most attention are (1) the stage of clearing at which to reject a cheque (the bank of first deposit, the processing centre or a Federal Reserve office); (2) how to recover and transmit proof-of-payment information including the payee's or depositor's name in an ACH format; (3) the disposition of the cheque itself.

It seems likely that in 1980 pilot projects on cheque truncation will be under way. Some will deal with special types of cheques, for example, wage and salary, dividend and travellers' cheques; some with high-value, low-volume transfers, for example, items in excess of \$10,000; and others with the low-value cheques that generate the bulk of transfer volume\*10).

## 2. Automated teller machines and cash dispensers

Both automated teller machines (ATMs) and cash dispensers (CDs) are used in the United States; however, more than 90 per cent. of the machines are ATMs and most offer a full range of services, including withdrawal, deposit transfer between accounts, cash advance from bank credit-card accounts, payments on loans and balance inquiries. ATMs are installed in bank lobbies, in external walls of bank offices and, increasingly, in off-premises locations such as shopping centres, airports and other public places.

At the beginning of 1974 there were 1,656 machines nationwide. For the years 1974-76 installations averaged a little more than 1,200 a year, bringing the cumulative figure at the end of 1976 to 5,305 machines. The year 1977 saw a surge in ATM growth that resulted in 2,444 machines being installed (double the growth rate of the previous three years). Only 2,000 machines were installed in 1978, however, bringing the cumulative total to 9,750\*11).

Surveys indicate that in 1979 and 1980 the growth rate of ATM installation will continue to be high, and it is estimated that over 13,500 machines will be in operation by the end of 1980, despite the high cost of the equipment (\$20,000-40,000). Average transaction volume per automated teller has increased significantly and is running at close to 4,000 transactions per month. However, individual ATMs have recorded up to 40,000 transactions in a single month and machines in urban areas have averaged as many as 15,000 transactions per machine per month.

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Comprehensive data are not available on the impact that growth in ATM deployment and usage has had on the number of banking offices (90,000) and the number of individuals employed as tellers (410,000, of which 90 per cent. are female). However, a 1977 study indicated that more than 60 per cent. of the 284 banks surveyed had experienced a reduction in manned teller transactions. The survey also indicated that 14 per cent. of the depository institutions had cut back on the employment of tellers, and that 35 per cent. of depository institutions expected such employment to be reduced in the future as ATM usage grows\*12).

Prior to 1977 off-line terminals were the prevailing mode of operation because low transaction volumes did not warrant the higher cost of on-line systems. As transaction volume has grown and loss experience with off-line machines in many instances has been adverse, on-line systems have come to predominate in new installations. The conversion from off-line to on-line also provides greater service flexibility.

The trend towards on-line ATMs has been paralleled by the growth in the interchange and sharing of ATM machines and networks. When the deployment of ATMs began, they were generally owned and operated by a single depository institution. In 1977 18 per cent. of depository institutions responding to an ATM survey stated that they had interchange agreements permitting customers of other depository institutions to use their ATMs. An additional 16 per cent. are expected to have interchange agreements in place in the near future. The number of shared ATMs and interchange arrangements has grown to about one hundred.

According to the survey on ATM usage previously noted, total ATM losses for 1977 were estimated at about 1 per cent. of gross volume. The primary loss categories are mail intercept, lost and stolen cards, unauthorised use, overdrafts, internal fraud and machine malfunction. Overdrafts are the highest loss category, with lost and stolen cards a distant second. As the number of on-line ATMs increases, losses resulting from overdrafts should be reduced.

### 3. Point-of-sale systems

During the late 1960s expectations were high that by the end of the 1970s point-of-sale systems capable of instantaneously transferring funds between consumers' and merchants' accounts would be commonplace. These expectations never materialised and, in fact, few such POS systems are in operation today. Legal barriers, proprietary constraints, merchants' objections to limitations on payment eligibility for their customers, the attractiveness of other payment instruments such as cheques and, in particular, credit cards, and the lack of perceived substantial cost savings have stalled POS developments.

Two legal barriers have slowed POS development by so limiting the size of market areas that potential transaction volumes are insufficient to support such systems. One of the legal barriers hinges on the definition of a terminal as a branch. If that interpretation is adopted, the McFadden Act applies and nationally chartered banks can deploy only terminals observing the constraints imposed on branches.

Another legal barrier is Federal anti-trust law, which has been interpreted in some instances to place severe restrictions on sharing arrangements for POS networks. There is no Federal law or regulation that specifically permits the sharing of the POS systems among depository institutions, and the laws regarding sharing that have been adopted by a few individual States vary considerably. However, under Federal anti-trust law any State law may be set aside if there is no public interest need for a State to regulate an industry and if adverse competitive effects ensue from the State legislation.

Consumer acceptance of POS systems has been relatively slow for a number of reasons, including the attractiveness of credit cards for purchasing goods and services at the retail level. A consumer will normally prefer a system that offers convenience credit, which permits deferral of payment for up to forty-five days without interest charges, to a system that immediately debits his account, unless there is a discount for cash. In the United States today virtually every type of merchant, with the exception of supermarket food stores, accepts credit cards, but few offer cash discounts.

The front-end development and operating costs of POS systems are substantial and require a high volume of transactions for viable operation. Costs must be recouped by charging either the consumer or the merchant or both. Depository institutions are reluctant to charge the consumer a separate fee for a POS transaction for fear of discouraging consumer acceptance. The price to the merchant must be kept competitive with his cost of handling cheques or cash, and access to terminals must be readily available to most of his customers to encourage trade participation. It is doubtful whether any POS system in the United States has, up to now, been able to deal with these constraints and to develop sufficient sustained volume to be profitable or even viable.

About one hundred POS systems are said to have been in operation at one time or another, but this number is misleading because the great majority of these POS systems do not make instantaneous funds transfers. Instead the systems primarily provide cheque verification and guarantee, credit card verification and transfer services for paper drafts. Most of the systems are owned and operated by a consortium of depository institutions. A small number are proprietary systems, owned and operated by a single depository institution for its own depositors or those of its correspondents or licensed participating institutions.

Cheque verification and guarantee services have been attractive to many merchants because bad cheque losses can be controlled at a relatively modest cost (about 5 to 15 cents per cheque). Consumer acceptance is assured because the payment instrument is still a cheque and not a debit card and the consumer's bank account is not charged until the cheque is cleared.

As far as can be ascertained, in mid-1979 there were fewer than twenty POS systems providing actual third-party funds transfer services. Of that number, about half were transferring funds electronically between the consumer and merchant accounts and the remaining systems used paper drafts. The systems that use paper drafts process these drafts in much

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the same way as a credit card transaction except that the consumer account is automatically charged instead of the charge appearing on a credit card statement. Most systems are also used for internal transactions and various verification services.

A few POS systems installed by technologically progressive depository institutions have ceased operation because of high costs and lack of volume. The first POS system, which was started in the early 1970s by Hempstead Bank of New York, was terminated in 1979. Citibank of New York ceased operating a 200-terminal, multi-state cheque guarantee network after two years of operation. City National Bank of Columbus, Ohio, discontinued the cheque guarantee service from its POS network because of high operating costs and fraud losses. Glendale Savings and Loan Association of California stopped operating a 100-terminal network in twenty-one supermarket locations that instantaneously transferred funds from a consumer's savings account to the supermarket account.

It is difficult to predict when, or even if, POS systems will become commonplace in the United States. The basic needs are clear. Supermarkets are the primary customers as they operate on a cash basis and show no inclination to accept credit cards. If terminals at their checkout counters (some of which are now fully computerised to read bar codes and to list purchases on sales slips) were able to accept debit cards from the bulk of their customers and if the cost of doing so were less than that of handling cheques or cash, it clearly would be advantageous to shift to debit cards.

Those merchants who now accept credit cards cannot expect significant debit card volume without implementing a two-tiered pricing system or persuading card issuers to price convenience credit arrangements more explicitly. Another possibility is that the electronics industry will develop less expensive and more versatile terminals. Of these alternatives, the latter is the most likely to be realised.

#### 4. Federal Reserve Communications System

Although the Federal Reserve Communications System (Fed Wire) dates back to 1913, the first components of the present automated funds transfer network were installed in 1970 and the system was fully automated in late 1973. The Treasury and a number of commercial banks are indirectly a part of this system, which allows virtually instantaneous transfers of funds among member banks of the System and facilitates the efficient handling of reserve balances. The system, to which all Federal Reserve offices are linked, operates through a central switch facility in Culpeper, Virginia.

The network handles transfers of reserve account balances (almost exclusively in large dollar amounts) from one member bank to another, and transfers of US Government and Federal agency securities. The transfer of reserve balances is used for the purchase and sale of Federal funds, the movement of correspondent bank balances, and for credit transfer on behalf of bank customers. Transfers on behalf of customers include the purchase and sale of commercial paper, bonds and other securities;

payment and cash management operations affecting corporate demand deposit accounts; and transfers of mutual fund balances. The following table on wire transfers shows that the number of transfers and their dollar value have grown substantially in recent years.

	<u>Wire transfers</u>					
	<u>1978</u>	<u>1975</u>	<u>1970</u>	<u>1965</u>	<u>1960</u>	<u>1955</u>
Number of transfers (millions)	29.0	17.5	7.4	4.4	2.9	2.0
Amount transferred (thousands of billions of dollars)	50.5	31.4	12.3	4.5	2.4	1.1

More than 400 member banks are connected directly to Federal Reserve computers and can originate and receive wire transfers using terminal equipment located on their own premises. A total of 85 per cent. of all wire transfers processed by the Federal Reserve are handled in this manner, with all processing (accounting, editing, and so forth) fully automated. Smaller commercial banks utilise the Fed Wire by telephone and subsequent paper confirmation.

The capability of this system is now being significantly enhanced by the direct inter-connection of computer installations at the larger commercial banks and Federal Reserve offices. These direct links became operational in early 1977, and in mid-1979 twenty-two of the largest banks were transferring funds through computer-to-computer links. Others are expected to come on-line in the near future. It is estimated that links with this capacity are cost-effective for 200 of the largest banks.

#### 5. Bank Wire

Bank Wire is a private communications system serving 175 commercial banks in seventy-five cities throughout the United States and Canada. On an average day, about 18,000 messages are handled on Bank Wire, resulting in transfers on correspondent accounts of about \$27 billion. In addition to funds transfers, the system is used for a variety of other interbank business communications. Funds transfers over Bank Wire can be effected on the same day by means of debits or credits to interbank demand deposit balances, and the transmitted information can include instructions to credit third parties' accounts.

In 1978 Bank Wire installed a new system (Bank Wire II) with improved payment settlement features as well as facilities for new types of traffic such as the transmission of ACH batched files.

The Federal Reserve has authorised its member banks that participate in Bank Wire to use their reserve account balances at Federal

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Reserve banks for settlement of payment transactions over Bank Wire. This facility will not become effective until legal and operational arrangements have been worked out.

### 6. The Clearing House Interbank Payments System

The Clearing House Interbank Payments System (CHIPS) is a non-governmental facility for international transactions. It is operated by the New York Clearing House Association, which has as its controlling members the twelve largest New York City commercial banks. CHIPS handles as much as 90 per cent. of daily international transactions in dollars.

Before CHIPS began operations in April 1970, internationally related payments in New York were effected with official cheques that were carried by hand to the Clearing House and transferred to payee banks in one of several daily cheque exchanges. However, the traditional practice of using cheques became too cumbersome and error-prone as the expanding international business of US banks and a growing pool of Euro-dollars resulted in a rapid increase in transaction volume.

CHIPS has grown steadily since 1970. In 1972 it provided direct computer access to some Edge Act corporations located in New York (subsidiaries of US banks which have their headquarters in states other than New York) and to foreign bank participants, in addition to the member banks of the New York Clearing House Association. Average daily dollar volume was about \$18.5 billion, with some 7,000 average daily transactions. More branches and agencies of foreign banks and Edge Act corporations were brought on-line as CHIPS participants in 1974 and volume grew that year to more than \$40 billion and 13,000 transactions daily.

By mid-1979 CHIPS average daily clearings totalled \$100 billion. On an average day CHIPS handles about 45-50,000 interbank transactions, but indications are that the number of transfers may approach 70,000 on higher-volume days. CHIPS also handles an average of some 15,000 intra-bank book transfers daily.

#### (a) Present scope of operations

CHIPS works on a "clearing house funds" or "next-day funds" basis; that is, CHIPS participants settle all CHIPS payments and receipts, including those made by participants other than the full-member banks, on the business day following the origination of a transfer. CHIPS settlement is effected through the Federal Reserve Bank of New York, where debit and credit entries are made on the books of Federal Reserve member banks\*13). CHIPS participants other than the twelve clearing house members originate about 60 per cent. of the dollar volume moved through CHIPS.



VII. CREDIT CARDS

The use of credit cards issued by banks, card companies or vendors has become a well-established financial management practice of households in the United States. More than 60 per cent. of the nation's families have cards of some type and more than half of these families make one or more card purchase per month. The cards issued by department stores, oil companies and other merchants can generally be used only to purchase merchandise or services at outlets owned or affiliated with the vendor company. Many of these cards have superseded merchants' charge accounts, which had been widely available to credit-worthy customers. The evolutionary development of vendor cards has had a gradual effect on outstanding convenience credit, the pattern of consumer expenditures and the displacement of cash and cheques\*14).

The bank cards (VISA and Master Charge) and the early travel and entertainment cards (American Express, Diners Club and Carte Blanche) have, on the other hand, developed and been promoted in a manner that has in a relatively short period of time greatly expanded the use of convenience credit by consumers\*15). In the main, the increasing use made of these cards derived from the facility they afforded responsible retailers to offer convenience credit to local and transient customers. Most such retailers had previously operated primarily on a cash basis.

The scale and efficiency of operation of the card-issuing companies have enabled them to displace thousands of in-house cards and related credit arrangements and to erode the profitability and even the viability of others. Only the very largest retailers - mainly those operating nationwide or in very large local or regional markets - appear to have the capability of competing with the more efficient card companies.

The effect of these developments has been to facilitate consumer spending, to give travel and entertainment outlays a higher priority, and to relax spending constraints associated with pre-payday fund shortages. Competition among retailers has been increased by the bank credit card, as convenience credit sales can be financed at small as well as at large firms with proprietary credit cards.

There has also been an effect on pricing practices for transaction services. The credit card is a hybrid payment instrument using credit as an intermediate step to final payment. And, although the consumer is unaware of the total transaction cost of this service, the merchant, the financial institution and the data processor know their costs and prices. In the case of bank cards, the merchant discounts credit card sales, at a rate of between 2 and 5 per cent. depending primarily on volume and transaction size, at his bank to obtain funds as promptly, or almost as promptly, as if he had received cash or had deposited a local cheque. The payer defers payment by borrowing, in effect, from the merchant, who includes the cost of convenience credit in the price of his service or merchandise. If extended credit is involved, the bank is the supplier of credit. Technically, the credit card is not a payment instrument, since it does not transfer funds between the payee and payer, but it displaces payment transactions by aggregating them into a single daily or weekly

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payment to merchants and into monthly-cycle payments by consumers. Another feature of the bank credit card is its capability to access a line of credit, usually on a revolving basis with payments of 10 per cent. of the outstanding balance. The finance charge on this type of credit is usually 18 per cent. per annum.

Many merchants accept credit cards and a few also offer price reductions for cash or cheques; others refuse to accept cards of any kind because of the discount involved. The food supermarkets, with a few isolated exceptions, are among those refusing to accept cards. They are the nation's largest retailers (annual volume, \$200 billion), and because of their relatively narrow profit margins and the nature of their business they are committed to the use of cash. Banks often charge them fees for coin and currency services and for handling cheques, but such fees are ordinarily based on the number of transactions or the cash supplied rather than the value of transactions.

If the debit card should develop as a viable competitive alternative to cash and cheques at supermarkets, it will gain a foothold enabling it to compete with credit card use in other types of stores. But for this to take place, discounts from the credit card price would have to reflect the non-use of convenience credit and the avoidance of credit card losses. Merchants are prohibited from imposing explicit surcharges for credit card transactions under Federal law.

The technology used to process credit card transactions for the major companies is primarily electronic. A paper sales draft with a copy to the consumer is created at the point of sale. The data on the sales slip are converted to electronics at the bank of first deposit or the data processing centre. A descriptive statement details transaction information for the consumer at the end of each monthly billing cycle. Instead of receiving a copy of each sales draft, the card-holder receives a statement with the date and amount of the transaction and the merchant's name and location. Many non-bank credit card systems still return copies of sales drafts to the card-holder but the current trend is to eliminate the copy and to provide a descriptive statement. Descriptive statements involve significant initial costs but expedite billing and reduce operating costs.

Some banks have recently added cheque guarantee and debit features to their bank card operations. These features are developing slowly at present. The cheque guarantee feature is often added to the credit card, and the debit feature may be offered as a separate card because of the difference in consumer liability involved. The capability exists, however, to offer all three features on a single card. In addition, many banks have modified their credit cards to allow the card-holder access to automated teller machines.

Credit cards are widely used for the purchase of the following categories of consumer expenditure: meals and beverages; clothing; accessories, jewellery; personal care; household requirements; pharmaceutical goods and sundries; tyres, accessories and parts; car repairs and car rental; petrol and oil; intercity transport; recreation; books, sports supplies and equipment; radio and television receivers and

records; radio and television repair; plants and flowers; admissions; and foreign travel. Overall, these categories amounted to approximately \$600 billion in 1978. Cards are also used infrequently for a large variety of other consumer-type expenditure. Another application of considerable significance is for business expense-account items such as transport, hotel accommodation, meals and entertainment.

Credit card billings of nearly \$150 billion in 1978 involved about 6 billion transactions and 2.5 billion payments. Table 6 shows the growth and development of the bank card market. Unfortunately, because of the proprietary nature of the data, similar information is not available for the rest of the credit card industry. As the table shows, the use of bank credit cards is spreading rapidly, and credit cards in general are displacing some cash and cheque transactions. In 1978 the use of bank credit cards resulted in 500 million payments replacing 1,500 million separate transactions, representing a net saving in payments equivalent to 3 per cent. of cheque volume.

#### VIII. TELEPHONE BILL PAYMENT

The payment of bills by telephone is a service that has been offered by some banks and thrift institutions since 1974. Initially, these services were introduced and regarded as profitable only as a device to attract new customers and deposits. Recent versions using "touch-tone" telephone equipment enable customers to deal directly with a computer that can receive and acknowledge the customer's instructions. There are now about 170 financial institutions offering such a service and the volume of payments has grown rapidly, reaching an annual rate of 25 million bill payments early in 1979.

Systems in operation vary in their level of automation and the types of bills that can be paid. If a customer does not have a touch-tone telephone, the traditional rotary telephone is used to dial an employee of the financial institution who initiates the payment in a paper or electronic mode. Some systems handle any type of bill, while other systems are limited to bills of payees who have made previous arrangements with the financial institution.

The costs incurred by the providers of telephone bill payment (TBP) services vary depending on volume, technology and the range of service. In general, telephone bill paying services that have a monthly payment volume of more than 10,000 transactions have a cost per bill paid in the range of 35 to 65 cents. Consumers who use TBP services are in most cases charged a fee. More than half the institutions offering TBP paying services charge fees based on usage, which normally amounts to 10 to 25 cents per bill paid. Other institutions charge a flat rate of \$1 to \$3 per month, although in many cases the fee is waived if the consumer maintains a certain minimum balance, usually in excess of \$1,000.

In many cases, the fees or flat charges that TBP service providers impose do not cover the cost of the service. The majority of TBP service

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providers are thrift institutions that generally do not have legal authority to offer chequing account services; hence, TBP was a method of meeting competition from banks. As telephone bill paying has attracted consumer interest in many locations, commercial banks have begun to offer the service in response to competition from thrift institutions.

Until recently, most financial institutions carried out TBP by mailing cheques with a computer listing identifying the payer to the payee. For multiple payments to a single payee, one cheque covers the aggregate amount of the payments and a computer listing identifies the individual payers. Financial institutions have begun to use the automated clearing house to carry out TBP transactions electronically. As this approach is more cost-effective, it is expected to displace the use of cheques.

### IX. CURRENT DEVELOPMENTS AND ISSUES

#### 1. Changing structure of the payment system

Several institutions other than commercial banks are becoming increasingly effective in competing for all or some part of the payment services traditionally performed by banks. The savings and loan associations and mutual savings banks have already secured limited regional authorisation (New England and New York) for full deposit transfer services. Credit unions throughout the nation can use share drafts for cheque-type payments. As of January 1980, the Congress was still considering legislation that would authorise another nationwide cheque-type payment instrument, a negotiable order of withdrawal (NOW) for both bank and thrift institutions, and would allow commercial banks to offer automatic transfer from savings to demand deposits.

Credit card companies, as indicated earlier, have on average displaced three cash or cheque transactions with a single payment for a monthly accumulation of purchases. Non-bank processors are serving the demand deposit accounting needs for a growing number of commercial banks and other depository institutions. Payment services are now offered by mutual funds, and there is at least one case in which a debit card issuer offers payment services to its card-holders regardless of the institutions in which their accounts are kept.

Further encroachment can be expected from sophisticated users of electronic technology both within and outside the banking industry as they see additional opportunities to substitute the electronic movement of payment information at declining costs for the rising cost of cheque-handling and transport.

2. Pricing by the Federal Reserve

The Federal Reserve uses a cost accounting system - Planning and Control System (PACS) - that reports on a quarterly and annual basis the direct support and overhead costs for the various payment functions it performs (circulation of coin and currency, commercial cheque clearing, electronic transfer). It does not charge member banks for such services on the basis of these costs or on any other basis. It is believed that to do so would cause further attrition in Federal Reserve membership. As of 30th September 1979, 61 per cent. of the insured commercial banks holding 25 per cent. of bank assets were non-members.

Although Federal Reserve clearing costs are well under 5 per cent. of the total cost of cheque payment, the banking industry views any increase in the cost of membership, such as charges for cheque clearing, as an additional reason for withdrawal from membership\*3). All national banks must be members of the Federal Reserve System but by converting a national to a state charter membership becomes voluntary and withdrawal feasible.

Congress has the problem of membership under active consideration. The House has passed a bill that, as of January 1980, is awaiting Senate action. While the issue is highly controversial within the deposit-taking industry - savings and loan associations and credit unions are involved, as well as banks - the controversy may be resolved within a matter of months. The Federal Reserve may then be able to price its payment services in relation to comparative resource costs without significantly influencing decisions as to membership.

3. Pricing by depository institutions

The Electronic Fund transfer Act (1978) and supplementing Regulation E of the Federal Reserve Board require financial institutions offering EFT transfers to furnish information to consumers on the cost and characteristics of the services they offer. The substance of such disclosures is concerned with account maintenance charges, activity fees, minimum or average balances in demand or savings accounts, immediate or deferred availability of deposits, and statement content. It is not clear whether comparable information will be required for paper transfers at the same institutions even though consumer interests in appraising competitive alternatives will hardly be served unless comparisons between electronic and paper transfers can be made.

The deposit-taking industry, recognising the thrust of recent pro-consumer legislation, has qualified "free chequing" and "free telephone bill paying" advertising and promotion with increasingly adequate disclosure of costs and terms for such services. The present trend in disclosure policies should encourage pricing of rival payment services in a way that will enable consumers to choose among alternatives on the basis of cost as well as convenience or habit.

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4. International payments

Recently, a proposal has been made by the New York Clearing House to change the conditions (imposed by the New York Clearing House) for the use of the CHIPS facilities for international payments by non-clearing-house banks or their subsidiaries (mainly Edge Act corporations). The contemplated change relates to possible losses resulting from the failure of a financial institution that is a participant in an international payment. The possibility of such losses has given rise to considerable discussion and study of the institutional and operational requirements for CHIPS transactions. A Federal Reserve System Task Force on International Payments is exploring the feasibility of alternative clearing arrangements. These discussions include an examination of the rôle of the Society for Worldwide Interbank Financial Telecommunications (SWIFT) and interface with the Federal Reserve wire system.

Table 1  
THE US PAYMENT SYSTEM  
MONEY COMPONENTS  
1955-78  
(Amounts in billions of current dollars)

Item	1978	1975	1970	1965	1960	1955
Population, 1st July (in millions of persons)	218.4	213.6	204.9	194.3	180.7	165.9
GNP .....	2,106.9	1,528.8	982.4	688.1	506.0	399.3
M <sub>1</sub> (daily average) .....	351.6	289.5	214.5	167.1	143.5	134.4
Percentage of GNP .....	16.7	18.9	21.8	24.3	28.4	33.7
Currency in circulation (daily average) .....	93.2	71.0	47.7	35.3	29.0	27.6
Percentage of GNP .....	4.4	4.6	4.9	5.1	5.7	6.9
Percentage of public debt .....	19.5	23.4	22.0	16.5	14.2	13.7
Demand deposits (daily average) .....	258.4	218.5	166.8	131.8	114.5	106.8
Percentage of GNP .....	12.3	14.3	17.0	19.2	22.6	26.7
Percentage of commercial bank assets .....	19.1	23.3	31.2	37.2	47.2	53.6
Public debt of US Treasury held by private investors, 30th June	477.8	303.2	217.2	213.7	204.5	201.4
Total assets of commercial banks, 30th June .....	1,354.8*	939.4	534.9	354.6	242.5	199.2

\* / Includes foreign and domestic assets; foreign assets not reported prior to 1976; domestic total for 1978 is \$1,215.1 billion and the share of demand deposits in that total is 21.3 per cent.

Sources: Banking and Monetary Statistics 1941-70 (Board of Governors of the Federal Reserve System, 1976); Annual Statistical Digest, 1971-1975, 1972-1976, and 1973-1977 (Board of Governors of the Federal Reserve System); and Assets and Liabilities: Report of Income for Commercial and Mutual Savings Banks (Assets and Liabilities published annually beginning December 31, 1969, Report of Income added beginning in 1972, Federal Deposit Insurance Corporation).

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Table 2

DEMAND, SAVINGS AND TIME DEPOSITS AT  
DEPOSITARY INSTITUTIONS, 1960-78 (30th June)  
(in billions of dollars)

Institution and type of deposit	1978	1975	1970	1965	1960
<u>Commercial banks</u> <sup>a/</sup> .....	849.6	649.4	363.9	264.6	180.7
Demand, adjusted <sup>b/</sup> .....	258.6	222.8	166.0	131.4	113.8
Savings .....	226.0	149.1	92.9	87.4	53.8
Time certificates .....	365.0	277.5	105.0	45.8	13.1
<u>Credit unions</u> (co-operative banks)					
Savings <sup>c/</sup> .....	52.1	31.1	14.6	8.6	4.7
<u>Savings and loan associations and mutual savings banks</u> ..	539.8	375.1	207.4	156.7	93.6
Demand deposits (MSB) ..	1.8	1.0	0.6	0.4	0.2
Savings MSB <sup>d/</sup> .....	77.9	68.5	64.9	50.2	35.1
S&L <sup>e/</sup> .....	144.6	117.9	86.0	102.8	58.3
Time certificates MSB ..	59.9	36.8	3.3	-	-
S&L ..	255.6	150.9	52.6	3.3	-
<u>All depositary institutions</u>	1,441.5	1,055.6	585.9	429.9	279.0
Demand deposits .....	260.4	223.8	166.6	131.8	114.0
Savings .....	500.6	366.6	258.4	249.0	151.9
Time certificates .....	680.5	465.2	160.9	49.1	13.1



- a/ Domestic offices only.
- b/ Demand deposits other than domestic commercial, interbank and US Government less cash items in the process of collection.
- c/ Credit union share accounts have the characteristics of savings deposits for the period 1959 to 1977. This generalisation may lose validity in the near future if credit unions issue a significant volume of time deposits under authority recently granted in Public Law 95-22 (19th April 1977).
- d/ Prior to 1966 deposits at mutual savings banks generally had the characteristics of savings deposits. From 1966 to 1972 the data shown represent an estimated separation of time and savings made by the staff of the Federal Reserve Board, based on survey and call report data. From 1972 onwards the figures shown are taken directly from data supplied to the Board monthly by the National Association of Mutual Savings Banks.
- e/ Prior to 1965 deposits outstanding at savings and loan associations generally had the characteristics of savings accounts. From 1965 to 1967 the data shown represent an estimated separation of certificates and savings deposits by the staff of the Federal Reserve Board, based on survey data. From 1968 onwards Federal Home Loan Bank Board data on accounts paying regular rates or less at savings and loan associations insured by the Federal Savings and Loan Insurance Corporation are adjusted to include an estimate for uninsured associations.

Sources: Commercial-bank savings, 1967-77, from internal Board files. Other data from Banking and Monetary Statistics, 1941-70 (Board of Governors of the Federal Reserve System, 1976); Annual Statistical Digest, 1971-1975, 1972-1976, and 1973-1977 (Board of Governors of the Federal Reserve System); Federal Reserve Bulletin; Annual Reports and Assets and Liabilities: Report of Income for Commercial and Mutual Savings Banks (Assets and Liabilities) published annually beginning 31st December 1969, Report of Income added beginning in 1972) (Federal Deposit Insurance Corporation).

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Table 3

NOTES AND COIN  
HANDLED BY THE FEDERAL RESERVE SYSTEM IN 1978  
(Number in millions)

Currency							Coin		
Denomi- nation	Outpayments			Returned			Denomi- nation	Outpay- ments	Re- turned
	New	Fit	Total	Fit	Unfit	Total			
(dollars)							(cents)		
1	1,705	1,830	3,535	1,838	1,530	3,368	1	12,548	2,503
2	14	53	67	58	4	62	5	4,150	3,204
5	440	754	1,194	769	382	1,151	10	7,010	5,813
10	428	1,544	1,972	1,568	368	1,936	25	7,747	6,751
20	507	1,907	2,414	1,933	344	2,277	50	174	78
50	49	77	126	80	22	102	100	118	35
100	71	56	127	57	16	73			
Total	3,215	6,220	9,436	6,303	2,665	8,968		31,747	18,374

Table 4

CHANGES IN CURRENCY AND COIN OUTSTANDING BY SELECTED DENOMINATIONS  
IN CURRENT DOLLARS, IN CONSTANT DOLLARS, AND AS A PERCENTAGE OF GNP\*

(percentage change)

Period	Total currency	\$1, \$2, \$5 & \$10	\$20	\$50	\$100	Fractional coin
<u>Current dollars</u>						
1960 to 1970	62	37	71	67	96	178
1970 to 1978	99	32	90	128	191	74
<u>Constant dollars</u> (a)						
1960 to 1970	24	5	31	27	49	112
1970 to 1978	18	-21	13	36	73	4
<u>Percentage of GNP</u> (b)						
1960 to 1970	-17	-29	-12	-15	1	27
1970 to 1978	-7	-39	-12	7	36	-12
<u>Currency returned as a percentage of currency issued</u>						
1960		98	93	94	86	
1970		89	74	49	37	
1978		87	68	46	22	

(a) Consumer price index: 1960, 88.7; 1970, 116.3; 1978, 195.4.

(b) GNP: 1960, \$506.0 billion; 1970, \$982.4 billion; 1978, \$2,106.9 billion.

\* Currency and coin outside the Treasury and Federal Reserve.

Basic data are as at 30th June. (Amounts in millions of current dollars.)

Year	Currency									Coin	
	Percentage of total								Total	Silver dollars	Fract. coin
	\$1 & \$2	\$5	\$10	\$1, \$2, \$5 & \$10	\$20	\$50	\$100	Other			
1978	3.7	4.2	11.4	19.3	35.1	10.9	34.3	0.4	\$95,933	\$1,130	\$9,832
1970	4.8	6.2	18.3	29.3	36.8	9.5	23.4	1.0	48,223	482	5,646
1960	5.1	7.2	22.2	34.5	34.9	9.2	19.4	2.0	29,726	305	2,033

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Table 5

FEDERAL RESERVE CHEQUE VOLUME

Type of cheque	1978	1975	1970	1965	1960	1955
		<u>Number of items (billions)</u>				
Government* .....	0.72	0.84	0.62	0.49	0.41	0.50
Other .....	14.10	11.40	7.20	4.60	3.40	2.60
Total .....	14.82	12.24	7.82	5.09	3.81	3.10
Other cheques per capita .....	69	53	35	20	18	16
		<u>Amount (billions of dollars)</u>				
Government .....	439	350	208	135	105	123
Other .....	7,111	4,257	3,332	1,634	1,154	928
Total .....	7,550	4,607	3,540	1,769	1,259	1,051
		<u>Average cheque size (dollars)</u>				
<u>Current dollars</u>						
Government .....	610	415	336	274	258	245
Other .....	504	373	465	355	338	351
<u>1967 dollars</u>						
Government .....	312	257	289	290	291	291
Other .....	258	231	399	376	381	438
<u>Memo:</u>						
Value of other cheques as percentage of GNP .....	337	278	339	237	228	232

\* Government cheques are cheques written by the Federal Government. Other cheques are cheques written by individuals, businesses and local governments.

Source: Annual Reports and Federal Reserve Bulletins (Board of Governors of the Federal Reserve System, various years).

Table 6

BANK CARD STATISTICS  
(VISA AND MASTER CHARGE)

Item	1970	1975	1978
Accounts (millions) .....	31.2	39.1	68.0
Transactions (millions) .....	330	692	1,500
Payments (millions) .....	150	280	500
Gross sales .....			
(billions of dollars) .....	6	20	44
Credit outstanding at year-end*			
(billions of dollars) .....	3	10	19
Losses as a percentage of gross sales .....	2.4	1.3	0.7
Delinquencies as a percentage of credit outstanding .....	6.7	3.8	3.7

\* Includes current billings for December.

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### Footnotes

- \*1) The constitutional powers of the Congress over money were set forth in "The Legal Tender Cases", *Juilliard v. Greenman* (110 U.S. 421) 3rd March 1884. What follows is an excerpt from that opinion:

The constitutional authority of Congress to provide a currency for the whole country is now firmly established. In *Veazi Bank v. Fenno*, 8 Wall. 533, 548, Chief Justice Chase ... said: "It cannot be doubted that under the constitution the power to provide a circulation of coin is given to Congress. And it is settled by the uniform practice of the Government, and by repeated decisions, that Congress may constitutionally authorise the emission of bills of credit". Congress, having undertaken to supply a national currency, consisting of coin, of Treasury notes of the United States, and of the bills of national banks, is authorised to impose on all state banks, or national banks, or private bankers, paying out the notes of individuals or of state banks, a tax of 10 per cent. upon the amount of such notes so paid out .... The reason for this conclusion was stated by Chief Justice Chase ... in these words: "Having thus, in the exercise of undisputed constitutional powers, undertaken to provide a currency for the whole country, it cannot be questioned that Congress may, constitutionally, secure the benefit of it to the people by appropriate legislation. To this end, Congress has denied the quality of legal tender to foreign coins, and has provided by law against the imposition of counterfeit and base coin on the community. To the same end, Congress may restrain, by suitable enactments, the circulation as money of any notes not issued under its own authority. Without this power, indeed, its attempts to secure a sound and uniform currency for the country must be futile." ... It appears to us to follow, as a logical and necessary consequence, that Congress has the power to issue the obligations of the United States in such form, and to impress upon them such qualities as currency for the purchase of merchandise and the payment of debts, as accord with the usage of sovereign governments. The power, as incident to the power of borrowing money, and issuing bills or notes of the Government for money borrowed, of impressing upon those bills or notes the quality of being a legal tender for the payment of private debts, was a power universally understood to belong to sovereignty, in Europe and America, at the time of the framing and adoption of the constitution of the United States. The governments of Europe, acting through the monarch or the legislature, according to the distribution of powers under their respective constitutions, had and have as sovereign a power of issuing paper money as of stamping coin. This power has been distinctly recognised in an important modern case, ably argued and fully considered, in which the Emperor of Austria, as King of Hungary, obtained from the English Court of Chancery an injunction against the issue in England, without his license, of notes purporting to be public paper money of Hungary. ... The power of issuing bills of credit, and making them, at the discretion of the legislature, a tender in payment of private debts, had long been exercised in this country by the

several colonies and states; and during the revolutionary war the states, upon the recommendation of the Congress of the Confederation, had made the bills issued by Congress a legal tender. ... The exercise of this power not being prohibited to Congress by the constitution, it is included in the power expressly granted to borrow money on the credit of the United States.

This position is fortified by the fact that Congress is vested with the exclusive exercise of the analogous power of coining money and regulating the value of domestic and foreign coin, and also with the paramount power of regulating foreign and interstate commerce. Under the power to borrow money on the credit of the United States, and to issue circulating notes for the money borrowed, its power to define the quality and force of those notes as currency is as broad as the like power over a metallic currency under the power to coin money and to regulate the value thereof. Under the two powers, taken together, Congress is authorized to establish a national currency, either in coin or in paper, and to make that currency lawful money for all purposes, as regards the national Government or private individuals. The power of making the notes of the United States a legal tender in payment of private debts, being included in the power to borrow money and to provide a national currency, is not defeated or restricted by the fact that its exercise may affect the value of private contracts.

- \*2) See Tables 1 and 5. The turnover of coin and currency is estimated to be 30-40 times per year, giving a transaction volume in 1978 of \$3,500-4,000 billion, compared with \$40,400 billion in debits to demand deposit accounts of individuals, partnerships, corporations, and state and local governments.
- \*3) Since 1922 the Federal Reserve has maintained a cost accounting system for the purpose of comparing costs and performance for similar specific functions at the twelve Reserve banks and their branches. In 1977 this system was overhauled and expanded to provide more functional information and a better allocation of costs. This system is referred to as "PACS", an acronym for "Planning and Control System". Data from it are available quarterly and annually.

Federal Reserve direct, support and overhead costs in 1978 for currency, coin, electronic transfers, commercial cheques and other cheques are as follows (in millions of dollars):

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	<u>Total</u>	<u>Less reimbursements and recoveries</u>
Currency	\$151.2	\$148.9
Coin	31.3	27.9
Electronic transfers	29.4	28.1
Commercial cheques	232.0	230.8
Other cheques	11.4	11.3
	<u>\$455.3</u>	<u>\$447.0</u>

Additional details are available for direct and support costs (excluding overheads) and for unit costs as follows:

<u>Currency</u>	<u>Million</u>	<u>Cost in dollars per 1,000 units unless otherwise indicated</u>
Note issue*	\$ 60.3	-
Paying and receiving**	38.3	182.52 (straps)
Verifying deposits**	12.3	1.44
Verification (Treasury)	1.9	5.41
Destruction (Treasury)	1.3	0.51
Cancellation	2.4	90.20
Total	<u>\$116.5</u>	
 <u>Coin***</u>		
Paying and receiving	18.3	0.288
Verifying deposits	2.0	0.118
Wrapping	1.9	1.11 (100 rolls)
Total	<u>\$ 22.2</u>	

\* Including cost of notes (\$58.8).

\*\* To and from financial institutions.

\*\*\* Treasury minting costs, \$30.4 million.

Electronic transfers

Transfer of reserve account balances	\$ 14.9	0.49 (per unit)
Automated clearing houses	6.2	39.41
Total	<u>\$ 21.1</u>	



Commercial Cheques

Processing	\$135.6	9.44
Adjustments	18.2	4.19 (per unit)
Return items	9.2	54.79
Intercity transport	1.3	-
 Total	 <u>\$164.3</u>	

Data on the cost incurred by the commercial banking system for its chequing account services to the public are not compiled by any official agency, but there were various unofficial estimates in 1978 ranging from \$11 billion to \$17 billion (35 to 53 cents per cheque). The range reflects the paucity of relevant data, differing assumptions regarding support and overhead costs, and the wide range in size of banks and operating conditions. Either the top or the bottom of the estimate range looks plausible as a cost of funds (4.2 and 6.6 per cent.) for \$258 billion of net demand deposits in a year when the Federal funds rate averaged 7.94 per cent. However, large, but unknown, amounts of compensating balances are held in demand deposit accounts for non-transaction services.

Another approach to quantifying chequing service costs can be based on the officially reported statements of income and expenses of all commercial banks. In 1978 operating expenses excluding interest, loan and security losses, and income taxes were \$35.6 billion (gross income was \$113.6 billion). Cheque services and the retail distribution of coin and currency are responsible for a large part of the cost of providing and staffing branch office facilities. However, data for a functional allocation of operating expenditures are not available for the banking system as a whole.

\*4) Assets and Liabilities: Report of Income for Commercial and Mutual Savings Banks (Federal Deposit Insurance Corporation, 31st December 1977, Table 9).

\*5) As at the end of 1977, in twenty-three statewide branching States there were twenty-one banking organisations and 220 banking offices per million persons. In twelve unit banking States there were 130 banking organisations and 180 banking offices per million inhabitants, with most of the branches having limited service capabilities. In the sixteen limited branching States, the corresponding numbers were sixty-one and 244. The pattern of evolution in structure since the early 1960s is towards twenty or fewer banks per million persons and about ten times as many offices.

\*6) The number of items per year per \$1,000 of IPC demand deposits in 1978 were: Boston, 102; New York, 34; Philadelphia, 52; Cleveland, 53; Richmond, 66; Atlanta, 67; Chicago, 54; St. Louis, 55; Minneapolis, 83; Kansas City, 72; Dallas, 39; San Francisco, 27.

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\*7) The phrase "currency in circulation" usually refers to paper currency and coin in the hands of the public - a money-supply aggregate that does not include currency at commercial banks. At the end of 1978 commercial banks held \$15.5 billion in currency and coin, making the total outside the Federal Reserve \$114.6 billion. (These data are not seasonally adjusted.)

\*8) One of these, the Currency Verification, Counting and Sorting System (CVCS) developed by Recognition Equipment Incorporated, is now operational. The American Bank Note Company has also designed equipment (ABN-300) which is undergoing acceptance tests.

The CVCS provides an automated, cost-effective currency processing capability and performs its functions in a highly secure fashion. The flow of notes through the equipment is as follows. Each packaged unit of currency is preceded by a header card that provides vital information to the operator. The notes then pass through a multi-item detector, an authentication station, a fitness detector station and a denomination detector station. Rejected notes are detoured into a reject pocket; fit notes go into strapper pockets where they are strapped into units of 100 bills. Unfit notes proceed into the shredder or, if selected, special audit pockets. In the meantime, all notes have been counted several times and pertinent information about rejects has been printed on a terminal. Each note has been measured against a fitness standard set by an operator so that a specific quality level is established for that machine's reissues.

The CVCS machine has a maximum operational speed of 72,000 notes per hour with an average system speed, including reconciliation, of 56,000 notes per hour, dependent upon the quality of the notes. Sustained throughput speeds of up to 68,000 notes per hour with \$20 bills of relatively good quality have been obtained. Sixty machines have been ordered for installation by January 1981.

Ten American Bank Note Company's ABN-300 are on order for delivery in 1980.

\*9) The Cheque Collection System: A Quantitative Description (Park Ridge, Ill.: Bank Administration Institute, 1970).

\*10) Based upon 1979 data from processing operations in forty-three Federal Reserve offices, 90 to 95 per cent. of cheques handled are for amounts under the average value and 50 to 65 per cent. are for cheques having a value of less than 10 per cent. of the average. Average values range from \$300 to \$900 except in New York. These data, as indicated elsewhere, do not include many large cheques handled outside the Federal Reserve System. Truncation of cheques in excess of twenty times the average value (about \$10,000 in 1979 - a cut-off often used in discussions of truncation) would involve less than 0.5 per cent. of cheques coming into the System but 55 to 70 per cent. of the value.

- \*11) Linda Fenner Zimmer, "ATM Boom Ahead", Bank Administration, Vol. 55 (May 1979), pp. 33-49.
- \*12) Linda Fenner Zimmer, Cash Dispensers and Automated Tellers, Fourth Status Report (Park Ridge, N.J.: Payments Services Correspondent, 1977).
- \*13) Until 2nd July 1979 daily positions of all CHIPS participants were combined with those of their designated clearing house banks and transmitted to the Federal Reserve Bank of New York. Participants were required by the clearing house's CHIPS rules to obtain Federal funds (same-day value) to cover their preceding day's debit CHIPS position by the settlement deadline of 1 p.m. If funds were not forthcoming, a participant's designated settling bank could refuse to settle the participant's position. Then, if the participant were unable to provide covering funds by 1.30 p.m., it would be in default. The entire settlement would then have to be "unwound" (reversed), entailing serious risks for some participants with considerable uncertainty of success and the risk of a serious crisis in the financial markets. The Federal Reserve Bank accepted the entries on the Settlement Report on a conditional basis pending completion of the accounting of the day's other business on its books. This conditional settlement resulted in market uncertainties and encouraged efforts to devise a procedure for final settlement based on the use of the Fed Wire funds transfer system, since transfers over this network are final and irrevocable when accepted by the Federal Reserve Bank.

During the summer of 1979 the New York Clearing House Association made a number of changes designed to clarify and to improve CHIPS operating procedures and to clarify the fact and extent of the substantial credit risks borne by some clearing house members in settling CHIPS positions on behalf of other CHIPS participants. These rule changes included allowing any CHIPS participant with an account at the Federal Reserve Bank of New York to use the Fed Wire to effect final CHIPS settlement, simplifying the "unwinding" procedures in the event of the failure of a participant to provide funds to "cover" its net CHIPS transaction position, and moving the time of final settlement to 10 a.m.

Same-day CHIPS settlement (the settlement of CHIPS positions on the day transactions are initiated) continues to be a goal of CHIPS participants, and it is believed that the changes made in CHIPS rules and procedures during 1979 will facilitate an eventual change-over to this settlement arrangement. The significant problems that remain to be resolved before a change-over can be attempted are being examined by representatives of CHIPS participants, the New York Clearing House Association and the Federal Reserve.

- \*14) Convenience credit is credit for which there is no overt finance charge. However, the evolution of credit cards has distorted the statistical reporting of convenience credit by combining it with revolving credit. For example, the Federal Reserve Board reports

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\$24.4 billion in revolving credit outstanding for banks at the end of 1978. (Federal Reserve Bulletin, vol. 65, February 1979, p. A42). About 37 per cent. of this amount, or \$9.1 billion, is convenience credit (1977 Consumer Credit Survey, Board of Governors of the Federal Reserve System, 1978).

\*15) Percentage of families using credit cards:

<u>Year</u>	<u>Bank</u>	<u>Travel and entertainment</u>	<u>Merchant</u>	<u>Oil company</u>	<u>All cards</u>
1977	35	7	50	32	60
1971	19	5	45	33	50

Source: 1977 Consumer Credit Survey (Board of Governors of the Federal Reserve System, 1978).

APPENDIX

LEGAL AUTHORITY FOR THE FEDERAL RESERVE SYSTEM'S  
ROLE IN THE PAYMENT MECHANISM

The Federal Reserve Act ("Act") became law in 1913 and established the Federal Reserve System as the central bank of the United States\*1). By the terms of the Act, the System comprises a Board of Governors located in Washington, DC, and twelve regional Federal Reserve banks. The Act also provides that commercial banks may become members of the Federal Reserve ("member banks"). Each Federal Reserve bank is given general authority under Section 4 of the Act (12 USC § 341) to take such actions as are necessary to carry on the business of banking as set forth in other parts of the Act\*2). Since its origin, the Federal Reserve has played a major rôle in the nation's payment mechanism. Under provisions of the Act, the Federal Reserve has become centrally involved in four of the primary methods through which funds are exchanged in the United States economy, namely, the clearing and collection of cheques and drafts, wire transfers of funds, the clearing of payment information contained on magnetic tape, and the distribution of currency and coin. In addition, the Act specifies that the Federal Reserve banks shall serve as the fiscal agent of the United States Government in transferring funds on behalf of the Government.

At the direction of the Board of Governors, the twelve Federal Reserve banks function as a nationwide collection system through which cheques and other commercial instruments may be collected. There are several specific provisions of law under which the Federal Reserve banks exercise cheque collection functions. Paragraph 1 of Section 13 of the Act (12 USC § 342) authorises each Federal Reserve bank to receive cheques and other instruments for the purposes of collection and exchange\*3). Paragraph 13 of Section 16 of the Act (12 USC § 301) requires every Federal Reserve bank to receive on deposit at par cheques and drafts drawn on member banks\*4). Paragraph 14 of Section 16 of the Act (12 USC § 248(o)) provides that the Board of Governors may require each Federal Reserve bank to exercise the functions of a clearing house for its member banks\*5).

Pursuant to Sections 11, 13 and 16 of the Act, the Board of Governors has promulgated Sub-part A of Regulation J (12 CFR § 210.1), which is designed to afford the public and the banks of the country a direct, expeditious and economical system for the collection of cheques. This regulation, issued by the Board of Governors under its statutory responsibilities, has the same force and effect as a statute passed by the Congress. Sub-part A of Regulation J details the rights and liabilities of parties using Federal Reserve collection facilities and permits the Federal Reserve banks to adopt "operating circulars" that detail the time limits and other procedures established by the Federal Reserve bank for collecting cheques. The operating circulars are viewed as contracts between the Federal Reserve and commercial banks and, as specifically provided in Section 4-103 of the Uniform Commercial Code, the Federal Reserve operating circulars constitute agreements that can vary the effect of the provisions of the Code.

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During the late 1960s the banking industry and the Federal Reserve began to initiate procedures to cope with the increasing volume of paper cheques being processed. Automated clearing houses were developed as an alternative to traditional cheque processing. The operations of such clearing houses essentially parallel cheque-clearing operations except that the payment information is exchanged on magnetic tape instead of on paper cheques. The statutory basis for the Federal Reserve's involvement is the same as that discussed above for paper cheques. More specifically, paragraph 14 of Section 16 of the Act authorises the Board of Governors to require the Federal Reserve banks to operate clearing houses for member banks. In November 1979 the Board of Governors issued for comment Sub-part C of Regulation J to govern the rights and responsibilities of participants using automated clearing houses operated by the Federal Reserve.

Beginning with a private Morse code system in 1918, the Federal Reserve has operated its own communications network for the telegraphic transfers of funds in order to provide the banking system with a more rapid means of transferring funds. The wire network is limited to use by Federal Reserve banks, member banks and certain other financial and international organisations that are authorised in the Act to hold reserve account balances at a Federal Reserve bank. These authorised users may make credit transfers that provide immediately available funds to the recipient. Wire transfers of both reserve account balances and Federal Government securities are permitted to be sent over the communications network. The statutory basis for transferring reserve account balances is basically the same as that used in the cheque collection system. In addition, paragraph 14 of Section 16 of the Act authorises the Board of Governors to regulate the transfer of funds among Federal Reserve banks and Section 13 authorises Federal Reserve banks to receive deposits from their members.

In 1977 the Board of Governors issued Sub-part B of Regulation J (12 CFR § 210.50) to govern the rights and responsibilities of member banks using the wire communications network. Sub-part B of Regulation J was issued pursuant to Sections 11, 13, 16 and 19 of the Act, and has the same force and effect of law as does Sub-part A. It permits Federal Reserve banks to adopt operating circulars that set forth the details of funds transfer operations.

The issuance and distribution of the nation's currency and coin is handled by the Federal Reserve banks. New bills (that is, Federal Reserve notes) are placed in circulation, fit currency is distributed as needed among commercial banks, and old, unfit currency is removed from circulation and destroyed. Paragraphs 1 and 3 of Section 16 of the Federal Reserve Act (12 USC §§ 411, 413) constitute the statutory authority for the issuance and redemption of Federal Reserve notes. Coin is distributed by the Reserve banks pursuant to the Subtreasury Act of May 1920 (31 USC § 476) and Treasury Department Circular 55 (31 CFR § 100).

The twelve Federal Reserve banks also serve as the Federal Government's principal fiscal agents. The activities performed as fiscal agent are under the general supervision of the United States Treasury Department, which reimburses the Federal Reserve banks for most fiscal

agency functions. The statutory basis for this rôle is Section 15 of the Act, which states that, when required by the Secretary of the Treasury, the Federal Reserve banks "shall act as fiscal agents of the United States; and the revenues of the Government ... may be deposited in such banks, and disbursements may be made by cheques drawn against such deposits".

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Footnotes to Appendix I

\*1) Federal Reserve Act, ch. 6, 38 Stat. 251 (1913) (codified at 12 USC §§ 221 et seq.)

\*2) The Act does not give the Federal Reserve authority to provide commercial banking services to the public. The banking functions authorised in the Act are related to the Federal Reserve's responsibility to regulate the flow of bank credit and money and to provide cash-balance and payment services to member banks and the US Government.

\*3) The first paragraph of Section 13 of the Federal Reserve Act (12 USC 342) provides in part:

Any Federal Reserve bank may receive from any of its member banks, and from the United States, deposits of current funds in lawful money, national-bank notes, Federal Reserve notes, or cheques, and drafts, payable upon presentation, and also, for collection, maturing notes and bills; or, solely for purposes of exchange or of collection, may receive from other Federal Reserve banks deposits of current funds in lawful money, national-bank notes, or cheques upon other Federal Reserve banks, and cheques and drafts, payable upon presentation within its district, and maturing notes and bills payable within its district; or, solely for the purposes of exchange or of collection, may receive from any non-member bank or trust company deposits of current funds in lawful money, national-bank notes, Federal Reserve notes, cheques and drafts payable upon presentation, or maturing notes and bills; provided such non-member bank or trust company maintains with the Federal Reserve bank of its district a balance sufficient to offset the items in transit held for its account by the Federal Reserve bank:...

\*4) The thirteenth paragraph of Section 16 of the Act (12 USC 360) provides:

Every Federal Reserve bank shall receive on deposit at par from member banks or from Federal Reserve banks cheques and drafts drawn upon any of its depositors, and when remitted by a Federal Reserve bank, cheques and drafts drawn by any depositor in any other Federal Reserve bank or member bank upon funds to the credit of said depositor in said Reserve bank or member bank.

To receive "at par" means the deposit must be accepted at the full face value of the cheque. Federal Reserve banks are precluded from accepting cheques that are drawn on banks that do not pay their cheques at par.

\*5) The fourteenth paragraph of Section 16 (12 USC 248(o)) provides in part:

The Board of Governors of the Federal Reserve System shall make and promulgate from time to time regulations governing the transfer of funds and charges therefor among Federal Reserve banks and



their branches, and may at its discretion exercise the functions of a clearing house for such Federal Reserve banks, or may designate a Federal Reserve bank to exercise such functions, and may also require each such bank to exercise the functions of a clearing house for its member banks.



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