

**Payment systems in
the Netherlands**

Table of contents

List of abbreviations	289
Introduction	291
1. Institutional aspects	291
1.1 The general institutional framework	291
1.2 The role of the Netherlands Bank	293
1.3 The role of other private and public sector bodies	296
2. Payment media used by non-banks	298
2.1 Cash payments	298
2.2 Non-cash payments	299
2.3 Recent developments	301
3. Interbank exchange and settlement systems	302
3.1 General overview	302
3.2 The real-time gross settlement system: TOP.....	302
3.3 The retail payment system: Interpay	306
4. Securities settlement systems	308
4.1 Trading	308
4.2 Clearing	310
4.3 Settlement	312

List of abbreviations

AEX	Amsterdam Exchanges
Au-FM	Authority for Financial Markets - <i>Autoriteit Financiële Markten</i>
BXS	Brussels Exchanges
CSS	Clearing and Settlement System (Interpay)
DNB	Netherlands Bank - <i>De Nederlandsche Bank</i>
DSI	Dutch Securities Institute
Interpay	Net settlement system for low-value payments
Necigef	Dutch CSD - <i>Nederlands Centraal Instituut voor Giraal Effectenbedrijf</i>
NIEC	Dutch Interprofessional Securities Centre - <i>Nederlands Interprofessioneel Effectencentrum</i>
NSC	<i>Nouveau Système de Cotation</i> , a French trading system
NVB	Netherlands Bankers' Association - <i>De Nederlandse Vereniging van Banken</i>
PVK	Pension and Insurance Board - <i>Pensioen- en Verzekeringskamer</i>
STE	Securities Board of the Netherlands - <i>Stichting Toezicht Effectenverkeer</i>
Switch	Order routing system on the Euronext Amsterdam Derivative Markets
TES	TOP End Station
TOP	RTGS system operated by DNB
VEB	Association of Stockholders - <i>Vereniging van Effectenbezitters</i>
Wtb	Act on the Supervision of Collective Investment Schemes - <i>Wet toezicht beleggingsinstellingen</i>
Wte	Act on the Supervision of Securities Trade - <i>Wet toezicht effectenverkeer</i>
Wtk	Act on the Supervision of Credit Institutions - <i>Wet toezicht kredietinstellingen</i>

Introduction

As with other payment systems around the world, technological innovation and evolving payment methods have influenced the Dutch payment system and led to a substantial decrease in the use of paper-based instruments. For point of sale payments the use of debit cards is still rising. In 2002 over 1 billion purchases at the point of sale will have been made by the electronic transfer of funds, that is about one third of all non-cash payments. For remote payments the key characteristics remain largely the same. The Netherlands relies very heavily on credit transfers or giro payments. Cheques are hardly used any more, either for remote or for point of sale payments. The majority of Dutch households and businesses hold more than one payment account. In August 2002, over 16 million inhabitants held over 21 million accounts.

Retail payment services are provided by most of the commercial banks. All the banks together process around 3 billion cashless retail payments each year. The Dutch payment services market is quite concentrated, as is the banking market as a whole. The bulk of private customer accounts are held with just a few banks. In addition to the deposit-taking institutions offering a wide range of payment services, there are a few international credit card companies and retail chains offering credit card services.

Many of the retail payments are processed centrally at the automated clearing house Interpay, in which nearly all banks participate. No other interbank low-value payment system of substance exists.

Large-value payments are processed via TOP, the RTGS system, which is owned and operated by the Netherlands Bank. Although the TOP system is, in principle, intended to handle large-value interbank payments, there are in fact no upper or lower value limits for payments. This also applies to cross-border payments via TARGET, to which TOP is linked.

The Dutch SSSs (securities settlement systems) are undergoing a period of transition and will eventually become part of a pan-European system, since the Amsterdam Exchanges (AEX) have merged into Euronext. A single integrated market has been formed together with the other merging companies, the Brussels Exchanges (BXS) and Paris Bourse, comprising a cash market for equities and bonds, a derivatives market and a commodity market. The integration of trading, clearing and settlement is taking place in stages and is expected to be complete by the end of 2003.

1. Institutional aspects

1.1 The general institutional framework

1.1.1 *Institutions responsible for regulating, supervising and overseeing the financial infrastructure*

The institutions that are allowed to conduct banking activities fall under the Act on the Supervision of Credit Institutions (Wtk), while investment institutions fall under the Act on the Supervision of Collective Investment Schemes (Wtb). The Second Banking Co-ordination Directive, which states the principle of mutual recognition of (EU) banking licences, and the Investment Services Directive, which opens the European market for investment services, are legally binding in the Netherlands as well.

Banking supervision has traditionally been a responsibility of the Netherlands Bank, while the Pension and Insurance Board (PVK) carried out supervision of pension funds and insurance companies and the Securities Board (STE), which became the Authority for the Financial Markets (Au-FM) as from March 2002, supervised investment institutions. However, in view of international developments like consolidation in the financial sector and diversification, the organisation of supervision is being revised. The first phase of this revision, in which the supervisory framework evolved from the traditional sectoral model to a functional model, was completed on 18 September 2002. Supervision of the conduct of all supervised institutions, as well as supervision of the provision of information to the public, falls under the responsibility of Au-FM, while prudential control is in the hands of both DNB and PVK. To this end a partial merger between the two institutions has been undertaken, and members of the DNB and PVK Boards have taken up positions on the Board of each other's institution. The three

supervising institutions come together in the Council of Financial Supervisors. The relevant laws are expected to be passed by 2004.

The 1998 Bank Act, in accordance with the Statute of the ESCB, contains a provision stating that the national central bank, ie the Netherlands Bank, shall promote the smooth operation of the payment system. This means that the Netherlands Bank is responsible not just at an operational level, but also as an overseer, for ensuring that the payment system functions smoothly. Efforts are being made to draw up a law on the supervision of settlement systems. This so-called "Infrastructure Act" will create a supervisory framework on the basis of which standards developed in the G10 context can be imposed on payment and securities settlement systems with a view to fostering and maintaining financial stability and confidence in payment instruments.

1.1.2 The legal framework

In the Netherlands, the legal framework underlying payments and securities consists of several general laws as well as private law. An overview of the main provisions governing payments and securities can be found in the subsections below.

Legal aspects of payment media and the provision of payment services to the public

Pursuant to the 1998 Bank Act, banknotes are legal tender up to an unlimited amount, while under the 1987 Coinage Act coins are legal tender up to a limited amount. The 1992 Dutch Civil Code includes a stipulation to the effect that non-cash payments are legally equivalent to cash payments.

The External Financial Relations Act contains stipulations on external payments, such as the obligation to report certain transactions for balance of payments purposes.

The Act on Cross-Border Payment Services was designed to implement Directive 97/5/EC of the European Parliament and the EU Council of 27 January 1997 and contains stipulations on the transparency and quality of cross-border payments. With Regulation 2560/2001 the European Parliament extended the coverage of transparency stipulations to the domestic market and required that the same charges apply to both domestic and cross-border euro electronic payment transactions and credit transfers.

With a view to preventing money laundering, the Identification Financial Services Act obliges financial institutions to ascertain the identity of customers wishing to effect certain payments and securities transactions on the basis of an official means of identification. In line with this, the Disclosure of Unusual Transactions Act provides that staff of, for instance, banks must report unusual transactions to a central Disclosures Office; in the context of the introduction of the euro coins and banknotes, the ceiling amounts were adjusted downwards. In addition to these Acts, the Exchange Offices Act requires that exchange offices be registered and that their directors be trustworthy.

A recent development is the so-called "financiële bijsluiter" or financial instruction leaflet that has to accompany complex financial products since 1 July 2002. Its purpose is to increase transparency for the public and to facilitate comparison between financial products.

Legal aspects of securities trading

The securities sector has traditionally been characterised by a high degree of self-regulation. Legislation in the field of securities is aimed at protecting investors and ensuring the adequate operation of the securities market. Three Acts are particularly important in this respect.

The Securities Giro Transfer Act of 1977 provides for the establishment of an institute responsible for the safekeeping, administration and general control of the book-entry securities transfer system. The institute for the book-entry transfer of securities (Necigef) sets up collective deposits in which the owners of securities are entitled to their proportionate share. Necigef determines which securities may enter its book-entry transfer system. Almost all securities listed on the Euronext Amsterdam stock market have been declared book-entry securities and are kept in safe custody by Necigef. The Act has been amended in order to include amongst others registered rights (dematerialised securities) in the book-entry system.

The Act on the Supervision of Securities Trade (Wte) took effect on 15 June 1992. It contains regulations for the supervision of securities business both on and off the exchanges, aimed at promoting the proper functioning of the securities markets and protecting the position of the investor. The Act provides regulations on selling securities, acting as an intermediary or portfolio manager and

organising a stock exchange. Under the Wte, most of the Minister of Finance's responsibilities and powers were delegated to Au-FM. The Wte was an enabling act and contained only framework regulations. Full regulations were laid down in the Decree on the Supervision of Securities Trade and in the Further Regulation on the Supervision of Securities Trade, drafted by Au-FM itself. In 1995, a new version of the Wte came into effect which was designed to bring Dutch legislation into line with the Investment Services Directive (ISD) and Capital Adequacy Directive (CAD) under EU legislation.

On 1 January 1997, the responsibility for supervising the institutions admitted to the stock exchange, at that time Amsterdam Exchanges N.V. (AEX; now Euronext N.V.), was transferred from AEX itself to Au-FM. The Wte 1995 was amended to incorporate this change. As seen above, the sectoral supervisory responsibilities of Au-FM have recently been replaced by a focus on supervision of conduct. Prudential supervision of the admitted institutions is in the hands of the DNB/PVK pair. In addition to its other functions, Au-FM is also responsible for the implementation of the Major Holdings in Listed Companies Disclosure Act 1996; the purpose of this Act is to increase the transparency of markets.

Legal aspects of payment and securities settlement systems

On 1 January 1999 the Finality Act of 17 December 1998, designed to implement the Directive on Settlement Finality (Directive 98/26/EC), came into force. The Act guarantees the final nature of the settlement of transactions in payment and securities settlement systems. To that end, the 1992 Wtk and the Bankruptcy Act were amended. Under the Finality Act, a court decision involving the invocation of the emergency regulation, an adjudication of bankruptcy or suspension of payment in respect of certain parties does not - by contrast with the zero hour clause - affect retroactive payments made by these parties in the designated systems. It ensures the secure functioning of the payment and securities settlement systems. On the basis of a recommendation by the Netherlands Bank, the Minister of Finance has meanwhile designated a number of systems, including TOP, DNB's RTGS, Interpay, the ACH for retail transactions, the AEX Stock and Options Clearings (now Clearnet) and Necigef, the Dutch CSD.

In 1997, when the responsibility for the supervision of institutions admitted to the stock exchange organisation was transferred from AEX to Au-FM, the Minister of Finance subjected the stock exchange's clearing and settlement systems to the Supervisory Framework jointly established by Au-FM and the Netherlands Bank. The Infrastructure Act will be a codification of the Supervisory Framework's standards and procedures for SSSs. The scope of the future Act is broader as it also concerns payment systems.

1.2 The role of the Netherlands Bank

De Nederlandsche Bank N.V. is a private limited company, the shares of which are held by the Dutch Government. The Bank Act, amended in 1998 to accommodate the Maastricht Treaty, ensures that the Netherlands Bank is independent of the Dutch Government. The Bank Act and the Statute of the ESCB stipulate the tasks of the Netherlands Bank in respect of payments.

Pursuant to the 1998 Bank Act and the 1992 Wtk, the Netherlands Bank is responsible for the supervision of banks. Banks wishing to operate as such and to raise funds that can be withdrawn on demand must obtain a licence from the Netherlands Bank and be entered in its register. Institutions wishing to offer solely payment services do not need to be licensed as banks. This exemption does not hold for institutions issuing electronic money.

The 1998 Bank Act states that the Netherlands Bank must ensure the smooth operation of payments. The Bank has a dual role with regard to payment systems: on the one hand, it provides payment services, for example to the local stock exchange, and, on the other hand, it is responsible for the oversight of payment and securities settlement systems. In order to be able to perform these tasks adequately, the Netherlands Bank holds regular consultations with banks and other parties involved in the functioning of these systems.

1.2.1 The operational role

The Netherlands Bank's operational contribution towards the smooth and efficient settlement of economic transactions takes the form of services relating to cash payments, non-cash payments and securities transactions.

Services in respect of cash payments

The 1998 Bank Act states that one of the Netherlands Bank's tasks is "to provide for the circulation of money as far as this consists of banknotes". This provision is in line with the Statute of the ESCB, which states that the Governing Council of the ECB may authorise the ECB and the NCBs to issue banknotes within EMU. The Netherlands Bank performs the following tasks in respect of the circulation of money:

- developing and ensuring the production of euro banknotes within the framework of the ESCB;
- distributing banknotes; and
- verifying and inspecting the banknotes in circulation.

Banknotes are distributed through the Netherlands Bank's four agencies. Every day, the banks withdraw large quantities of money to provide their customers with ready cash. Banknotes are distributed via ATMs and banks' offices (including the post offices). Excess banknotes flow back to the banks, which usually process them in cash centres, after which they are returned to the Netherlands Bank. The latter then checks the banknotes for counterfeits and inspects the quality of the notes; unfit notes are replaced while others are put back into circulation.

While the Netherlands Bank is responsible for banknote issuance, the Ministry of Finance is responsible for minting and issuing coins. The Coinage Act stipulates the manner in which this is to be done. The Bank gives advice on the number of coins to be minted annually. By virtue of a Royal Decree, the Netherlands Bank is responsible for the distribution of coins. The Bank has organised the distribution of coins in line with the distribution of banknotes, and is considering outsourcing this part of its activities.

Services in respect of non-cash payments

The Netherlands Bank performs an operational role in the processing of non-cash interbank payments. Its system is used to settle the payments of institutions that have an account at the Netherlands Bank.

Most domestic banks are linked to the Netherlands Bank's gross settlement system, TOP. In 2001, these banks effected on average 16,000 transactions per working day, with an average daily value of EUR 85 billion. These are large interbank payments arising from domestic money market and securities transactions and cross-border interbank payments carried out via TARGET. Cross-border payments accounted for 13.1% of the total number of transactions and 56.0% of the total value of transactions processed in TOP.

The banks also settle their retail payments via TOP. These are net amounts arising from the daily clearing carried out by Interpay, the Dutch net clearing and settlement system for low-value payments. In 2001, an average of 10 million transactions were conducted per working day, with a relatively low total daily value of less than EUR 7 billion. The Netherlands Bank itself is not involved in the processing of individual low-value payments, but it does oversee the development of processing systems. Section 3 examines the operational side of payment systems in greater detail.

Services in respect of securities transactions

The Netherlands Bank plays a major operational role in the settlement of high-value securities transactions. In respect of securities transactions not performed via the stock exchange, it provides DVP services for banks; in 2001, these accounted for about 36% of all transactions in TOP. In addition, the Netherlands Bank is the settlement bank for Clearnet Amsterdam. Furthermore, it manages the collateral for the clearing members.

1.2.2 The role of the Netherlands Bank as overseer

The Netherlands Bank performs the task of overseer. Oversight addresses the security, reliability, continuity and efficiency of SSSs, payment systems and payment instruments. The main objective of oversight is to prevent systemic risk. This applies in particular to the oversight of securities settlement and payment systems. With regard to payment products, the aim is mainly to protect consumers.

Concerning the practical aspects of oversight, a distinction is made between:

- evaluating the setup of the assessment frameworks for the management of risks inherent in SSSs, payment systems and payment instruments; and
- testing the systems' operating procedures.

Oversight of payment systems is the exclusive responsibility of the Netherlands Bank. It therefore entails both evaluating the setup of the assessment frameworks and testing the method of operation of Interpay's system for low-value payments and of the Netherlands Bank's own large-value payment system, TOP. The in-house payment systems of banks are basically subject to the supervision exercised pursuant to the Wtk. The internal auditing department plays a major role in the daily assessment of TOP. The Netherlands Bank's external auditor also assesses the system in terms of existing standards.

In order to achieve clarity and to make a distinction between oversight and supervision pursuant to the Wtk, the Netherlands Bank has set up a separate unit responsible for oversight. This unit examines and analyses the risks inherent in (new) SSSs, payment systems and payment instruments and makes recommendations on how they should be managed.

The oversight of SSSs is a shared responsibility. Assessing the method of operation falls within the remit of Au-FM, while evaluating the setup of and changes in the assessment frameworks for SSSs is the joint responsibility of Au-FM and the Netherlands Bank. To this end, the latter drew up an outline of the assessment framework on the basis of the Lamfalussy standards. At the end of 2000, the evaluations of the assessment frameworks for the existing Dutch SSSs were completed. The merger of the Paris Bourse, the AEX and the BXS has an impact on the practical aspects of oversight in an international context.

In order to facilitate international cooperation in the oversight of Euronext's clearing activities, a Memorandum of Understanding (MoU) on clearing was concluded in early February 2001 between the Dutch, French and Belgian supervisors and overseers involved. It is based on principles such as cooperation on equal terms and mutual acknowledgment of national jurisdictions. With a view to coordinated supervision and oversight a Co-ordination Committee on Clearing was set up, on which all banking supervisors, securities regulators and overseers have a seat. This committee, in which the Bank participates, discusses planned systems changes and coordinates oversight measures to be taken.

As Euronext stock exchange transactions are settled via Euroclear Bank in Belgium, cooperation in respect of settlement is also required. In early 2002 cooperation between the Dutch, French and Belgian supervisors and overseers was laid down in an MoU. In this MoU on settlement, the Belgian supervisors and overseers have been recognised as lead supervisory authorities. A settlement committee was established with representatives of the Belgian, French and Dutch authorities charged with the supervision and oversight of Euronext's settlement activities. The settlement committee will discuss all the settlement issues relevant for Euronext. The committee has an advisory function; the Belgian supervisors will implement its recommendations to the best of their ability.

The following table gives an overview of the systems subject to oversight and the institutions responsible for such oversight.

Payment and securities settlement systems and overseers

	Assessment of setup	Assessment of operation
Payment systems		
Interpay	DNB	DNB
TOP/TARGET	DNB	DNB
SSSs		
Euronext Amsterdam Stock Clearing	Au-FM/DNB	Au-FM
Euronext Amsterdam Derivatives Clearing	Au-FM/DNB	Au-FM
NIEC	Au-FM/DNB	Au-FM
Necigef	Au-FM/DNB	Au-FM
NLKKAS (Euronext Amsterdam Commodity Clearing)	Au-FM/DNB	Au-FM

1.2.3 Cooperation with other institutions

At the national level, the Netherlands Bank and commercial banks have set up a consultative structure in order to exchange views about policy objectives formulated by national and international authorities and to communicate their own policy aims.

At the level of the Boards of Management, the Steering Group on the implications of EMU was set up in 1994 to discuss the consequences of the euro for the Dutch banking system. This Steering Group's task was later extended. For instance, it provided guidance on the preparation of the banks' automated systems for Y2K and, in early 2000, it was transformed into a general consultative forum, the Payments and Securities Settlements Policy Forum (*Beleidsoverleg Betalingsverkeer en Effectenafwikkeling*, BBE) comprising the Netherlands Bank and the banking system. The Netherlands Bank chairs the forum, while the Netherlands Bankers' Association (NVB) acts as its secretariat.

Under this Policy Forum, the Working Group on Payments and Securities Settlement serves as a forum for consultations between the Netherlands Bank and the Dutch banking and securities sectors. The aim is to achieve a structured exchange of information on major issues relating to payments and securities transactions. The Working Group reports to the Policy Forum and is made up of representatives of the Netherlands Bank, the commercial banks, the stock exchange (ad hoc) and Interpay. The Netherlands Bank holds the chair, while the NVB acts as the secretariat.

At the European level, numerous ESCB working groups are active in the field of payment systems. Cooperation in the field of securities also takes place in the framework of the ESCB-CESR (Committee of European Securities Regulators) working group. At the broader international level, the main forum is the Committee on Payment and Settlement Systems, of which the Netherlands Bank's Executive Director responsible for payments is a member.

1.3 The role of other private and public sector bodies

An overview of the other important private and public players in the payments and securities sectors can be found in the subsections below.

1.3.1 Bodies in the payment sector

Netherlands Bankers' Association

The Netherlands Bankers' Association (NVB) is the most important interbank consultative body in the banking sector. Its objective is to serve the interests of banks in a general sense. Nearly all banks registered in the Netherlands are members of the NVB. The interbank consultative body has a

relatively simple structure, with policy committees, committees and working groups advising the Association's Executive Committee.

The NVB's Policy Committee on payments is the main consultative body in respect of payment systems. It is made up of those members of the Boards of Management of the various banks who are in charge of payment systems. This Committee is concerned with general policy frameworks and joint infrastructures, as well as retail and wholesale products. An Advisory Committee on payments consisting of the banks' senior payments managers supports the Policy Committee. This Committee heads a number of working groups covering a variety of aspects relating to payment systems.

Interpay Nederland B.V.

Interpay Nederland B.V. is the central clearing institute for retail payments set up by the banks with a view to promoting and maintaining efficient payment processing and reliable payment systems. Interpay runs the network of POS terminals and the interbank authorisation network for cash dispenser transactions, issues credit cards and provides image-processing services to individual banks. The banks are both its shareholders and customers.

Consultations are held within the Advisory Board, made up of the members of the NVB's Advisory Committee on payments.

Social Forum on the Payment System

The Social Forum on the Payment System (*Maatschappelijk Overleg Betalingsverkeer*, MOB), which replaces the former Working Group on the Efficiency of Payments, is made up of senior officials of the representative organisations of suppliers (banks) and users (consumers and businesses) of payment systems, as well as of governing and public bodies. The aim is to contribute to an efficient organisation of the Dutch payment system by exchanging information on practical bottlenecks and policy issues, and by striving for joint agreements on efficiency measures. The Forum does not have regulatory competencies. The Bank chairs the Forum and performs secretariat functions.

1.3.2 Bodies in the securities sector

Euronext N.V.

On 22 September 2000, the AEX, the Bourse de Paris and the BXS officially merged to form Euronext, establishing the first fully integrated cross-border single currency stock, derivatives and commodities market. Euronext is a holding company with the three stock exchanges working as operating companies with their registered offices in Amsterdam. Being established as a Dutch company, Euronext has a two-tier board structure, as required under Dutch company law (called *structuurregime*). Euronext Amsterdam N.V. is a wholly owned subsidiary of Euronext N.V. and is responsible for the organisation of the Dutch stock exchange, derivatives markets and commodities markets.

Authority for the Financial Markets

The predecessor of the Authority for the Financial Markets (Au-FM), the Securities Board of the Netherlands (STE), was established in 1988, following a decision to entrust the supervision of securities business, both on and off the stock exchange, to an independent organisation, removed from both government and the securities sector itself. The STE's mandate was to ensure the proper functioning of the securities markets, to increase the transparency thereof and to protect the position of investors. On 1 February 1989, the STE was entrusted by the Minister of Finance with the supervision of the Dutch stock exchange, reporting to the Minister. As from 1 March 2002, the STE became Au-FM in the framework of the reorganisation of supervision from a sectoral to a functional model. At the national level, Au-FM is responsible for the supervision of conduct and works together with the two other supervisors entrusted with prudential supervision, the Netherlands Bank and the Pension and Insurance Board (PVK). At the international level, Au-FM is the Dutch representative at the International Organization of Securities Commissions (IOSCO) and the CESR (Committee of European Securities Regulators).

Dutch Securities Institute

The Dutch Securities Institute (DSI) was established to foster the confidence of investors in the securities sector by promoting the quality and integrity of the people employed, in particular traders, investment consultants, portfolio managers and investment analysts. To this end, it keeps four public registers, maintains a Code of Conduct and has set up a Complaints Committee.

Necigef

Pursuant to the Securities Transfer Act, Necigef is responsible for book-entry transactions, as well as the custody, management and administration of securities on behalf of the participants. Necigef is a wholly owned subsidiary of Euronext Amsterdam N.V.

The management of securities which do not fall within the scope of the securities Giro Transfer Act, such as dematerialised bonds, may be carried out by the Dutch Interprofessional Securities Centre (NIEC).

Association of Stockholders

The Association of Stockholders (VEB), founded in 1924, aims to promote the interests of stockholders and stockholding in general.

2. Payment media used by non-banks

2.1 Cash payments

Banknotes and coins are the media used for cash payments. Both are legal tender, although the acceptance of coins by the public is compulsory only up to certain maximum amounts. Under the terms of the Coinage Act 1948, the Royal Mint, an institution supervised by the Ministry of Finance, produces coins. In accordance with Article 105a of the Treaty establishing the European Community, "the ECB has the exclusive right to authorise the issue of banknotes. The ECB and the national central banks may issue such notes". With reference to the Treaty, the Bank Act 1998 stipulates that the Netherlands Bank has the sole right to issue banknotes in the Netherlands.

At the end of 2001, the currency in circulation consisted of six denominations of banknotes (NLG 1,000, 250, 100, 50, 25 and 10) and eight denominations of coins (NLG 50, 10, 5, 2.50, 1, 0.25, 0.10 and 0.05).¹ The currency in circulation amounted to EUR 11.3 billion, against EUR 18.7 billion a year earlier, the decrease being due to the changeover to the euro notes and coins. Of this total, EUR 10.4 billion was accounted for by banknotes, against EUR 17.4 billion in 2000. At the end of 2001, banknotes constituted 6.5% of the narrow money supply M1 and 2.6% of the broader money supply M3, against double these figures a year earlier. In the early months of 2002 a relatively large amount of euro notes and coins were brought into circulation, so as to ease the changeover. By April 2002, banknotes constituted more than 7.5% of M1 and nearly 3% of M2.

No exact figures are available for the number of cash payments. As a rough estimate, around 70% of the total volume of commercial transactions are effected in cash. Apart from everyday expenses, cash is also used in specific markets such as the used car market, as well as when tax evasion plays a role. The total volume of cash payments in 2001 was estimated at 7.1 billion, while the value of cash payments was estimated to be EUR 70 billion. However, the larger the value of the payment, the greater the tendency to pay by cashless means using deposit money.

¹ In the early months of 2002, these were replaced by seven denominations of euro notes (EUR 5, 10, 20, 50, 100, 200 and 500) and eight denominations of euro coins (EUR 0.01, 0.02, 0.05, 0.10, 0.20, 0.50, 1.00 and 2.00).

2.2 Non-cash payments

Non-cash payments are made by transferring money deposited on a sight account, to which the account holder has direct access, by ordering the bank to withdraw or transfer the desired amount. Most households and businesses hold one or more accounts. At the end of 2001, they held about 22.5 million accounts, of which around 1.5 million were corporate accounts. Nearly all transactions in trade and industry are settled by cashless payments.

At the end of 2001, 93.5% of the narrow money supply M1 was held in the form of sight deposits with banks. About 3.8 billion cashless payments were made that year for a total value of around EUR 3,500 billion. In order to transfer deposit money Dutch banks offer similar payment instruments, such as credit transfers, direct debits and payment cards. Banks also offer payment services that are not related to sight accounts, such as traveller's cheques and money orders. The value and volume of these services is relatively limited.

2.2.1 Credit transfers

Practically all non-recurrent payments in trade and industry, as well as some household payments, are effected by means of ordinary credit transfers. This payment instrument, which has been standardised between banks, is also used by the central government and local authorities. When used by households, most of the original ordinary credit transfer instructions are still sent in paper form. However, a growing number of account holders use data communication lines to deliver payment orders to their bank, either via a computer (electronic banking) or by telephone (telephone banking). Corporate customers and government institutions mostly use non-paper-based, electronically readable methods of payment. Bulk payment orders are usually delivered via data communication lines. A declining number of corporate orders are still delivered on magnetic tapes.

In order to make processing more efficient, Dutch banks offer two types of pre-prepared credit transfers: the standing order and the "inpayment transfer" or "accept giro". In order to pay recurrent bills, an account holder may choose to set up a standing order with the bank, on fixed dates, for fixed amounts and for a named account. This non-paper-based method of payment is frequently used for rent, subscriptions, insurance premiums, etc. On the fixed date, the bank effects the transfer and no further action on the part of either the account holder or the payee is required.

When using an accept giro, the payee takes the initiative by sending a fully prepared transfer form together with the bill. In most cases the payer's account number, name and address are already printed on the form, as they are already known from previous payments. All the payer has to do is sign the form and send it to its bank. This payment instrument is used for both regular and non-recurrent payments of either fixed or varying amounts, eg insurance premiums, subscriptions or bills for deliveries to regular customers.

This pre-prepared transfer is a paper-based instrument which is mainly processed by means of image-processing technology to convert the relevant payment data into digital information. However, a growing amount of accept giro information is reaching banks in digital form, as account holders use electronic banking software packages to deliver their payment orders. In this case, account holders take care of the conversion of the relevant data. Banks are looking into a digital version of this pre-prepared transfer by using internet sites to send bills and accept giros (electronic billing).

Giro payments are prominent in the Netherlands, as 38% of the total volume and over 90% of the total value of retail payments are made by credit transfer. Credit transfers are often used for business-to-business payments. The average amount of a payment by credit transfer is over EUR 1,700.

2.2.2 Direct debits

Direct debits constitute a separate category of instruments for collecting payments. The payer signs a mandate authorising the payee to charge the former's account for goods delivered or services rendered. The transfer is initiated by the payee, who sends the payment order in electronic form (via data communication lines or on magnetic tape) to the bank with instructions to collect the money due by debiting the debtor's account in favour of its own account. The payers, however, remain in charge of their accounts, maintaining the opportunity to make use of a payback guarantee at their banks until a certain point in time.

Direct debits are frequently used for collecting recurrent payments, such as payments to public utilities and telephone companies. The electronic form and the short processing route make the direct debit a

very efficient means of collecting payments. Dutch banks offer several types of direct debits in order to meet the specific needs of different types of payment, such as the purchase of lottery tickets (without a payback guarantee) and mail order services.

In 2001, 27% of all retail payments were made by means of direct debits. The average amount paid using direct debits is around EUR 230.

2.2.3 Payment cards

Payment cards are plastic cards with several functions used to initiate payments at the point of sale or to make withdrawals from an account. For the issuer, the most important function is the authentication of the account holder by checking a signature or a PIN.

Since around 1995 the use of debit cards with PIN authentication for daily retail payments has grown enormously, partly replacing cash and completely replacing the use of guaranteed cheques. At the end of 2001, the total number of payment cards in issue was 27.2 million, consisting of 4.7 million credit cards and 22.5 million debit cards. Most debit cards are equipped with an electronic purse function.

The following types of payment cards are in circulation: debit cards, credit cards, retailer cards and prepaid cards (single purpose and multipurpose).

Debit cards

Debit cards are cards with direct electronic access to a bank account with the use of a PIN. The majority of debit cards are equipped with a magnetic stripe as well as a microchip. Three types of debit functions can be distinguished: withdrawal, payment and mere identification in the context of payments.

Debit cards are used to make withdrawals, either in cash at an ATM or in electronic money by loading an electronic purse. In 2001 over 90% of all cash withdrawals were made at ATMs, accounting for 470 million transactions. The average amount withdrawn increased to EUR 84 per transaction. All 7,142 ATMs in the Netherlands are interoperable and are connected to the international ATM network. For security purposes, use of another bank's ATM is subject to a daily limit in terms of both the number of withdrawals and the amount withdrawn.

Debit cards are used mostly at EFTPOS terminals in shops, restaurants and hotels, etc. In the mid-1990s, the number of POSs grew enormously, as did the volume and value of the transactions. In 2001, the total volume of EFTPOS transactions exceeded 950 million, accounting for a total value of EUR 42 billion, which amounts to 30.6% of the total volume but only 2% of the total value of cashless payments. At the end of 2001, 165,000 EFTPOS terminals were in operation. The availability and reliability of the network exceeded the minimum standard of 99.98%.

Debit cards are also used for identification in the context of payments. Traditionally, the signature on the card was used for identification in conjunction with the use of guaranteed cheques. Cards are increasingly being used as an electronic identification device to authorise credit transfers (remote payments) made by telephone or to authorise payments over the internet.

Credit cards

The volume of credit cards in circulation increased considerably from 420,000 in 1988 to over 4.7 million in 2001. The number of credit card transactions at the point of sale is still modest: just over 1.6% of non-cash payments are made by credit card. Since most Dutch banks issue MasterCard, this brand is most often used. Despite the fact that most banks do not issue Visa, the number of Visa cards issued is high owing to a co-branding strategy with non-financial institutions (insurers, automobile associations, etc.). Some retail chains actively promote their own retailer cards (private label cards), but from a payments point of view their role is insignificant compared with the use of payment cards and cash.

Prepaid cards

A prepaid card is a payment card which contains purchasing power that is paid for in advance. The most widespread prepaid card is the single purpose telephone card, which enables national and

international telephone calls to be made from pay phones. The use of these cards is declining owing to the spectacular growth in the use of mobile phones and of multipurpose electronic purses.

At mid-2002, around 16 million cards were equipped with an electronic purse, the "chipknip", that can be loaded at 4,258 loading devices and used for payments at about 160,000 EFTPOS terminals. The infrastructure seems ready for mass use. After a few years of sluggish growth, in 2002 the use of electronic purses seems to have taken off, with an estimated 80 million transactions, two and a half times as many as in 2001. For consumers, the added value of the purses is most likely to be generated by replacing small-value cash payments and the use of coins. It is not surprising then that two thirds of all transactions are payments for parking, catering and purchases from vending machines. The growth in the use of the purse can be explained by the introduction of euro coins and notes and by the fact that three major cities have made electronic parking payments compulsory. For visitors without a reloadable chipknip, a multipurpose stored value card has been issued, which can be bought in these cities.

Moreover, banks are investing in applications to use the chipcard technology for identification purposes in telephone banking and internet banking.

2.2.4 Cheques

Given that a satisfactory giro transfer system has been available to the public from a very early stage, non-guaranteed cheques have never played a significant role as a general payment instrument in the Netherlands. In the second half of the 1960s, following the large-scale introduction of sight accounts for the public, the guaranteed cheque was introduced together with a cheque guarantee card showing the cardholder's account number and signature. For point of sale payments, it served as one of the main non-cash instruments in the period between 1970 and 1990. In the 1990s, the number of cheque payments declined substantially, reflecting their replacement by EFTPOS payments. Given the decline in the use of cheques, as well as the high processing costs, Dutch banks stopped issuing cheques in July 2001 and terminated processing by the end of that year.

2.3 Recent developments

New distribution channels for payment services

Many corporate and private bank customers use electronic banking systems to send credit transfers and to receive account information. In 2001 over 2 million households, one third of all households, used electronic banking for sending payment instructions to their bank. The next step in the evolution of electronic banking involves further adaptation for internet use. Internet banking enables account holders to access their accounts from any location in the world. Security is guaranteed using hard tokens (calculators or the already widespread chipcards). More and more Dutch consumers choose internet banking to communicate with their banks; there were about 1 million users in 2001.

In a similar way, banks provide automated banking services via telephone, particularly for their private customers. With such services, customers can access information on their accounts, transfer money to and from their own savings and investment accounts and send credit transfers to third-party accounts.

The second step in the development of telephone banking involves the use of mobile phones for banking and internet services. If a mobile phone is equipped with a secure chipcard, it becomes a small terminal with many possible applications, such as making financial transactions. The new generation of mobile telephones will give rise to the development of a wide range of new services, including WAP-based secure payment services. In 2001 a large retail bank launched a WAP-based mobile banking project in cooperation with a service provider; over 0.5 million consumers now use their mobile phone for sending payment instructions and receiving information from the bank.

Since internet retailers are faced with many different means of payment, companies have been established which specialise in back office payment processing. These new "payment intermediaries" take care of the administration and settlement of all incoming internet payments, no matter what kind of payment instrument or method is used. Some banks offer the same kind of services, increasing the competition between banks and non-banks, such as consulting agencies and telephone companies.

3. Interbank exchange and settlement systems

3.1 General overview

Cashless payments are processed in two interconnected payment systems:

- the TOP system of the Netherlands Bank; and
- the automated clearing house for retail transactions (Interpay).

3.2 The real-time gross settlement system: TOP

TOP, the real-time gross settlement system of the Netherlands Bank, has been designed for processing and settling large-value payments in euros. TOP is not an acronym. Rather, the system is named after the market sector in which it operates: the “top”, ie the sector handling the largest-value payments in the Netherlands.

The total transaction volume in TOP in 2001 was 4.2 million, with a total value of EUR 21,500 billion. The average value per transaction amounted to EUR 5.1 million.

3.2.1 General overview

The Netherlands Bank offers current account facilities to banks and to the government, allowing banks to fulfil their reserve requirements on these accounts and permitting the settlement of payment transactions on its books. Although TOP is, in principle, intended to handle large-value interbank payments, there are in fact no upper or lower value bounds. This also applies to cross-border payments through TARGET.

The TOP system only handles credit transfers on a gross basis, which means that payments are settled immediately and irrevocably, provided that the paying bank has a credit balance on its current account or enough unused collateral to make a secured overdraft. In the event of inadequate cover for a debit transaction, the payment order cannot be processed. For this purpose, a queuing mechanism has been developed.

TOP processes different types of transactions. First, there are the purely domestic transactions, such as normal interbank transfers, securities transactions, net settlement transactions and cash cover transactions. In 2001, the share of these domestic transactions was 54.6% of the total volume and 39.1% of the total value processed by the system.

The second category relates to “8007” transactions, which are domestic interbank transactions where at least one non-resident account holder is involved and where balance of payments reporting obligations must be fulfilled. These transactions constituted 33.2% of the total volume processed in 2001 and 5.9% of that year’s total value.

Third, there are the pure cross-border payments through TARGET, with a 12.2% share in total volume and a 55.0% share in total value in 2001.

TOP makes it possible to assign up to three different priorities to a payment order: priority 2 for urgent payments, priority 3 for normal payments and priority 9 for non-urgent payments. The latter are not processed immediately. High priority payment orders must be processed as quickly as possible. To this end, part of the balance may be reserved for such orders. Participants cannot assign priority 1, which is the highest priority determined by the Netherlands Bank and is reserved for, amongst other things, the settlement of ancillary systems.

3.2.2 Participants in the system

The access criteria for participants in TOP are set by the ESCB in respect of the participation of credit institutions in the TARGET system. Within this framework, the Netherlands Bank has set the following access criteria for participation in TOP:

- financial departments of central or regional governments of EU member states which are active in the money market;

- institutions forming part of the government sector, as referred to in Article 3 of Council Regulation (EC) 3603/93, which have been authorised to hold accounts for customers;
- supervised credit institutions as referred to in Article 1, first indent, of Directive 77/780/EEC which are established in the EEA;
- supervised investment firms as referred to in Article 1.2 of Directive 93/22/EEC which are established in the EEA; and
- supervised providers of clearing and settlement services.

In addition to domestic central governmental institutions, all authorised credit institutions are eligible to participate, including Dutch-based subsidiaries of foreign banks and branches of foreign banks to which the Second Banking Co-ordination Directive of the European Community is applicable. The same holds for supervised non-bank financial intermediaries such as payments and securities clearing institutions, but they have limited use of the system and do not have access to the credit facilities. The rules are identical for all participants. Each participant subject to reserve requirements normally holds one reserve account, which may also be used for payment purposes. Besides the above-mentioned institutions, the Bank offers accounts to other NCBs and some international financial institutions (IFIs). IFIs do not have direct access to the system, but use the central bank as their correspondent.

3.2.3 Types of transactions handled

As mentioned above, TOP processes both domestic and cross-border transactions. The most commonly used types of transactions are briefly discussed below. In TOP, each transaction type is designated by a letter code.

FA transactions

An FA transaction is a standard transaction for domestic interbank payments, eg call loans. FA transactions can be entered by each participant in respect of accounts for which the participant is entitled to authorise debit transactions. When entering the payment order, the account holder indicates the desired priority. In the case of a standard FA transaction, the priority will usually be 2 or 3. Within TOP, FA transactions may be scheduled. Scheduling means that the payer assigns a future value date to the payment order. TOP records the transaction and queues it for processing on that future date. Scheduled transactions may be withdrawn; for this reason, until the value date, the payee cannot obtain information on scheduled credit transactions to its account.

Cash cover transactions

A cash cover transaction (CH) is used for the acquisition of banknotes and coins, which are subsequently transported by cash-in-transit companies from the offices of the Netherlands Bank to participants. Participants authorised to make such withdrawals enter a cash cover transaction debiting their own account and crediting the DNB office concerned, before the withdrawal takes place.

A cash cover transaction is an irrevocable payment order which reserves account cover for a future value date. It can be assigned priority 2 or 3. The transaction is settled on the value date. If account cover is insufficient, the order is queued. If no account cover has been reserved at the closing time for such transactions, the transaction is cancelled.

Trade-for-Trade transactions

Trade-for-Trade (TfT) transactions concern the gross settlement of over-the counter (OTC) securities transactions in the wholesale sector of the Euronext Amsterdam Stock Exchange. During the day, the Dutch securities settlement institute, Necigef, sends batches of payment instructions arising from securities transactions to TOP. The batches are sent through SWIFT. The payment orders are settled individually in real time.

Net settlement transactions for ancillary systems

The TOP system is used for the settlement of retail payments, cleared by Interpay, and for the settlement of securities and derivatives transactions, cleared by Clearnet. These are divided into five types of transactions: the debit (DL) and credit lots (CL) made of the bulk retail payments processed by Interpay, the bulk securities payments sent by the Euronext Amsterdam Stock Clearing (CV), the

bulk payments by the Euronext Derivatives Clearing (OV) and the urgent payments from Interpay's special Telegiro circuit (TV, see Section 3.3).

With the "lot settlement procedure", multiple net settlement was introduced on 1 October 2001; the daily stream of transfers processed by Interpay is split into "lots" (DL and CL). Instead of once a day, as is still the case for the settlement of the other ancillary systems, net settlement of retail payments takes place around every 30 minutes. This procedure is further described in Section 3.3.

Net settlement transactions are handled in TOP as a "unit of work". Settlement is effected as soon as the appropriate proportion of account cover has been reserved for all accounts to be debited. Net settlements are automatically assigned priority 1 and cannot be scheduled.

8007 transactions

An 8007 transaction (DP) is a payment order involving a cross-border payment where at least one non-resident account holder is involved. "8007" refers to the code under which these transactions must be reported to the Netherlands Bank for the compilation of the balance of payments. These transactions do not affect the balance of payments as such, because they only refer to the domestic transaction between the domestic party's bank and the correspondent bank of the foreign party.

Cross-border transactions

In TOP, there are two types of cross-border transactions conducted through TARGET: Interlinking customer payments (IC) and Interlinking interbank payments (IB).

Cross-border payments to countries which are not operating on the day in question are rejected by TOP. Cross-border payments to countries which have not yet opened for operations but will be operating on the day in question are accepted by the system.

In the Netherlands, cross-border TARGET payment orders can be sent to TOP through the SWIFT network. Provided that the payer's account cover is sufficient, TOP converts the cross-border payment order into an interlinking message and reserves the required proportion of the payer's account cover. The interlinking message is sent to the NCB of the country where the payee holds an account. This NCB credits the payee's account and notifies the Netherlands Bank. TOP then lifts the cover reservation and debits the payer's account, sending the payer a debit note. The debit note is sent via SWIFT. The few banks that do not have access to the SWIFT network may send their orders on tape or on paper. DNB sends them paper-based debit notes.

3.2.4 Operation of the transfer system

TOP is in operation from 7 am to 6 pm for the receipt of payment orders requiring same-day settlement. The closing time for customer payments, however, is 5 pm. Within these operating hours, allowance must be made for interbank deadlines for certain transaction types and TARGET deadlines for customer payments. TOP's opening hours have been brought into line with TARGET's opening times and calendar of operating days.

When TOP closes, the Payments Supervisor starts the end-of-day process, which is meant, among other things, to reveal whether all queues are empty. If they are not, the Payments Supervisor will, in consultation with the parties involved, take appropriate action (ranging from a request to replenish an account balance to the cancellation of transactions). If all queues are empty, the value date is closed by preparing and transmitting the "statement of account", the "end-of-value date survey" and the "daily 8007 external payments report".

3.2.5 Transaction processing environment

Participants communicate with the TOP system through the SWIFT network and through TOPView.

At the end of 2000, TOP expanded its capacity to send and receive messages via SWIFT and formed a "Closed User Group" in order to serve all participants. TOP has been recognised as a "Market Infrastructure" within SWIFT, meaning a higher service level provided by SWIFT and high priority during recovery. SWIFT has become the primary channel for payment-related communication for TOP participants. Because the SWIFT network allows for straight through processing (STP) and had to be used for cross-border transactions through TARGET, banks increasingly used it to deliver domestic

payment orders in TOP as well, making the TES workstations that were formerly used to communicate with TOP redundant. In the second half of 2001, the TES were discontinued.

TOPView was introduced by the Netherlands Bank in the spring of 2001. TOPView offers secured browser-based access to payment information such as waiting queues and account balances. Customers in a Windows environment are connected to a virtual private network (a secured network over the internet). Authentication is effected by means of a digital certificate on a chipcard. This communication channel cannot be used for credit advices or transfer orders, but banks can rearrange their queues, change the prioritisation of their payments or cancel payments for future value dates. With the latest release, in May 2002, banks can have an overview of their payments in TOP of the last five working days.

3.2.6 Settlement procedures

During opening hours, TOP settles payments irrevocably and with immediate finality upon receipt. As soon as the account cover is sufficient, TOP ascertains whether one or more items from the queue can be processed. In addition, batch items (8007) with the same priority are sorted in ascending order of value. This enables all items to be processed as quickly as possible. Following settlement, debit and credit notifications are sent to the account holders concerned.

If account cover is not sufficient, payments are queued. Orders are arranged within the queue on the basis of their priority and, within each priority class, on the basis of the time of receipt. The order of transactions within the queue also governs the order of processing: transactions in the same priority class are handled on a FIFO basis. As soon as a credit transaction is effected, TOP once again checks whether transactions from the queue can be processed.

The order of queued items can be influenced by means of "pointing". A payment order may be pointed forward, that is, towards the head of the queue, immediately before orders with priority 2. Orders with priority 1 always remain at the head of the queue. An order may also be pointed backwards, that is, towards the rear of the queue, immediately after orders with priority 3. Furthermore, participants are allowed to change the order of queued transactions within the same priority class.

A queued transaction cannot be revoked. Queued transactions can only be cancelled by the Payments Supervisor of the Netherlands Bank in consultation with all parties involved.

3.2.7 Credit and liquidity risks and their management

TOP only settles transactions subject to sufficient cover, permitting only secured (collateralised) overdrafts, which significantly reduces liquidity and credit risks.

3.2.8 Pricing policies

As a principle, the Netherlands Bank recovers its costs. It charges each account holder an annual fee of EUR 725. In addition, transaction fees are charged according to the medium used and the monthly number of transactions. Cross-border transactions through TARGET are subject to the ESCB pricing structure.

3.2.9 Main projects and policies being implemented

Since the introduction of TOPView, participants in TOP have to use two different communication channels for transferring orders (SWIFT) and for accessing payment-related information (TOPView). There are plans for TOP to migrate to SWIFTNet at some point in time; participants will then be able to exchange information and to send transfer orders based on internet protocols.

After the successful introduction of the so-called "lot settlement procedure", which increased the settlement frequency of the cleared retail transactions, the Netherlands Bank and Interpay are envisaging modifying the settlement procedure of urgent "Telegiro" retail payments. These payments are very fast and settlement is guaranteed by a separate collateralised credit facility at the Netherlands Bank. The end-of-day net positions are finally settled at the Bank. Telegiro transactions could be settled directly in TOP, in order to improve efficiency, from a liquidity management point of view, by uniting the two separate credit facilities.

3.3 The retail payment system: Interpay

In order to facilitate the collection and processing of retail transfers between their customers, the Dutch banks, with the exception of the Postbank, formed a common clearing house in 1967, which is now called Interpay. This circuit currently consists of about 70 banks, where altogether about 15.2 million accounts are held. Interpay's shares are in hands of nine banks. Interpay is organised in two divisions: Giro Services, which is responsible for the clearing and settlement-related operations, and Acquiring Services, which runs the authorisation network for card transactions.

It should be noted that, apart from the clearing, which takes place through the facilities provided by Interpay, a considerable amount of retail transactions are processed at the large banks themselves, using in-house processing facilities. Since the banking sector is highly concentrated, a large number of payments are for transfers between customers of the same bank. A large proportion of these payments do not reach the clearing house, but are transmitted to the individual banks' processing centres.

Interpay not only acts as the automated clearing house for interbank payments, but also as the central routing switch for all EFTPOS transactions and ATM transactions involving customers of other banks, and as a subcontractor for parts of the Eurocard issuing and transaction authorisation process. Additionally, Interpay performs image-processing services for some banks.

The Interpay clearing house system is fully automated. The number of transactions processed in 2001 was 2,558.3 million, with a total turnover of EUR 1,574.1 billion.

3.3.1 General overview

Banks participating in the ACH have a common account numbering system, which allows for an automated number check. Account numbers, as well as names and addresses of account holders of the participating banks, are administered centrally by Interpay.

Interpay acts as an intermediary between the participating banks. It receives transfer orders and converts them automatically into debit and credit items for individual banks and individual account numbers. The transfer orders can be sent in by individual banks or by large companies. Interpay collects the entry data for all financial transactions and transfers these data to the bank. In some cases, Interpay passes the payment details straight on to the customers of the bank.

The technical operations by Interpay are followed by financial settlement. The participating banks have authorised Interpay to manage the daily settlement process at the Netherlands Bank on their behalf; the account of each bank is debited or credited by the difference between the total debit and credit items.

Interpay does not have a financial relationship with bank customers. The individual bank itself makes the actual debit and credit entries in the accounts and produces and sends the statements of account, using automated processes.

3.3.2 Participation in the system

Almost all deposit-taking banks participate in the system. The Netherlands Bank is not a participant, although it uses some of the Interpay services.

3.3.3 Types of transaction handled

Interpay handles all types of retail transactions: mass regular disbursements by firms such as the payment of salaries, express payments, regular payments by consumers such as the payment of utility bills by means of "accept giros" (inpayment transfers) and direct debits, and all kinds of retail transactions using debit and credit cards as well as electronic purses.

3.3.4 Operation of the system

The system is a net settlement system. In fact, it comprises two systems: the Clearing and Settlement System (CSS) for bulk payments and the Telegiro circuit for urgent payments.

The Telegiro circuit was created for urgent payments between banks and between their customers. This service includes very fast (ie within a few minutes) and guaranteed settlement and notification to

the beneficiary of the irrevocable settlement. It is often used for paying relatively large amounts, for example in real estate transactions. The guarantee does not involve any risk, because the system is based on a collateralised credit facility, which is separated on a daily basis from the facility that participating banks have at the Netherlands Bank. The formal settlement of these secured interbank payments takes place once a day at the Netherlands Bank on a net basis.

3.3.5 Transaction processing environment

Although processing takes place in two operating centres, the clearing house system, CSS, operates in an integrated manner. Transfer orders may be submitted in different ways, by both banks and corporates. The latter deliver their mass payment orders and direct debits directly to the clearing house via data communication lines or on magnetic tapes. Banks use the same kind of data carriers, but may also present bulk payment orders on paper, in which case Interpay takes care of their conversion into digital form. Interpay processes paper-based standard payment orders, as well as cheques and “accept giros”, using image processing technology. Consequently, Dutch banks do not need to exchange any paper-based payment information.

On 1 October 2001, the old “bulk settlement”, in which all retail transactions were cleared in two daily runs at Interpay, was replaced by the “lot settlement” procedure. There are two types of transaction bundles, the so-called “debit” and “credit” lots. Debit lots are compiled for one bank at a time, and contain only transactions with that bank on the debit side and several payees on the credit side, such as salary payments or creditor payments by business clients. Credit lots include transactions involving several banks on both the debit and the credit side, such as in payment transfers, ATM withdrawals and EFTPOS payments. The clearing of retail payments closes every 30 minutes for settlement at the Netherlands Bank and then reopens for the next clearing round. Banks may increase the frequency for debit lots by specifying a maximum total amount. Routing for the debit and credit banks involved takes place on the basis of a central file, containing all the account numbers and customers’ names and addresses.

Payment orders delivered before 15:30 can be settled the same day.

The banks have a common account numbering system, which allows for automated error controls. All numbers contain nine digits and are centrally distributed by Interpay. Although it is not a formal participant in the clearing house, the Netherlands Bank also makes use of the Interpay account numbering system.

3.3.6 Settlement procedures

Interpay is authorised by the participating banks to effect the daily settlement payments at the Netherlands Bank on their behalf. During settlements, short banks pay their due amounts on Interpay’s clearing account at the Netherlands Bank, after which Interpay pays out to the long banks. Settlement of the debit and credit lots takes place about every 30 minutes between 07:30 and 17:00. Multiple settlement reduces systemic risk, improves the service to banks by providing irrevocable output after settlement of each lot, and speeds up the overall processing time of transfer orders.

Settlement of the Telegiro subsystem takes place at around 14:00. Settlement is subject to sufficient cover for debit positions. During the course of the morning, banks are informed by Interpay of the net results to be expected so that they can raise additional liquidity in the money market before settlement time, if need be.

3.3.7 Credit and liquidity risks and their management

Credit and liquidity risks are not managed within the clearing house system, but rather in the TOP via the system’s relationship with the money market. Interpay informs the participating banks of the net retail clearing results to be expected, this information then being used by the liquidity managers of the banks. Credit and liquidity risks are limited in the Telegiro subsystem as well as in TOP, owing to the fact that it is fully collateralised. The introduction of multiple net settlement further limits the risks stemming from the net settlement process.

3.3.8 Pricing policies

The basic pricing policy of Interpay is that the system should be self-financing. For this reason, prices are based on full cost recovery (which covers cost and a surplus percentage). In practice, a certain amount is paid per transaction and per batch, by both sender and receiver.

3.3.9 Main projects and policies being implemented

Next to lot settlement, another improvement concerning the speed and reliability of payment processing is the possibility of making a direct connection from customers' administrative systems to Interpay's technical infrastructure: I-connect offers banks and firms several ways of connecting their administrative systems directly to the processing system. Using an internet browser in a Windows setting facilitates the dial-up process either by way of a local service provider or via a direct line to Interpay. Mass transfer orders (over 50,000) are transported by ISDN lines using the File Transfer Protocol.

Furthermore, Interpay is working on a new way of electronically processing accept giros without using paper forms, which can be described as electronic billing. Instead of sending a paper invoice together with an accept giro form by post, suppliers would send it electronically to Interpay, which would forward it to the website of a debtor's bank. Debtors would receive a message saying where to find it and would electronically make out and deliver their order to transfer the due amount.

4. Securities settlement systems

In September 2000 the AEX, the BXS and the Paris Bourse officially merged into Euronext. A single integrated market was formed, comprising a cash market for equities and bonds, a derivatives market and a commodity market. Merging all the exchange-related activities is taking place in phases. The first phase, introducing a single platform for trading with unified listing and trading rules, with the former national exchanges becoming local entry points, was implemented during the course of 2001. The second, unified clearing, is expected to be finalised by the end of 2002. Clearing of securities and options will be centralised in Paris (Clearnet). The third phase, a single settlement and custody platform, provided by Euroclear, is expected to be in place by the end of 2003. The cash settlements will continue to take place in the systems of the NCBs and securities settlement will continue to be executed across the books of the national depositories.

Since its launching, Euronext has expanded its European presence by taking over LIFFE, the UK derivatives exchange, in December 2001 and merging with Bolsa de Valores, the Portuguese exchange, in February 2002. Cross-membership and cross-access agreements have been signed with the Luxembourg and Warsaw stock exchanges.

As the phased integration process is still under way, this section mainly describes the transition period.

4.1 Trading

4.1.1 Integrated trading in Euronext

The three domestic financial centres continue to use their local primary markets for listed companies. The listing requirements have been harmonised such that Euronext operates as a single integrated exchange for all listed securities. There is a single group of listed securities, although these securities enter the market via one of the three listing centres (Amsterdam, Brussels or Paris). Each listed security is accessible to all Euronext members, regardless of the nationality of the issuer or the member. It has been agreed with the regulators in the three member countries that a member licensed in one particular market will automatically receive a passport enabling it to operate in another Euronext country as well.

With regard to cash securities, Euronext already provides a unified order-driven trading platform based on the French system NSC (*Nouveau Système de Cotation*). With regard to derivatives, in order to operate a single options market accessible from each of the three Euronext entry points, migration from floor trading to electronic trading will be achieved by December 2002. Moreover, Euronext

acquired the London International Financial Futures and Options Exchange (LIFFE) and chose to migrate to the LIFFE CONNECT electronic system. Euronext Brussels and Paris will introduce LIFFE CONNECT in March and April 2003 respectively, with Amsterdam and Lisbon following at a later date. Euronext's and LIFFE's derivatives markets will be integrated under the name Euronext.liffe.

4.1.2 Securities trading

Securities trading has been fully harmonised since October 2001, when the NSC system, which was already in use in France and Belgium, was introduced in the Netherlands.

At the end of 2001, 1,539 companies, representing a market capitalisation of EUR 2,070 billion, had shares listed on the Euronext securities market, which is segmented as follows. The top segment comprises the 100 largest companies in terms of market capitalisation and certain minimum liquidity criteria. The second segment consists of the next 150 largest companies. In addition to these "Top Stocks" segments, Euronext operates segments designed for companies operating in the New Economy (Next Economy) and for small and mid-cap companies. Euronext also has a bond segment for both government and corporate bonds.

Securities markets

Transactions in listed securities on the retail market must be settled through the Euronext order book. With regard to the wholesale market, prices may be determined outside the Euronext Amsterdam Stock Exchange. The exchange, however, must be notified of the transaction and the price at which it was concluded. Prices of these so-called block trades may differ by only a certain percentage from the order book prices. Euronext discloses the direct deal turnovers to the market to promote fair pricing in the retail segment.

The Euronext Amsterdam Stock Exchange opens at 09:00 and closes at 17:30.

Financial intermediaries

Securities trading is conducted through admitted institutions, intermediaries authorised by Euronext Amsterdam to perform certain functions. Two main categories of intermediaries can be distinguished: brokers and dealers. Brokers trade exclusively on account of third parties, which can be other members. Dealers are allowed to trade on their own account only and certain dealers act as liquidity providers. Liquidity providers take positions against buyers or sellers, where necessary by entering buy and sell prices in the electronic order book for a range of securities assigned to them by Euronext Amsterdam. Apart from this functional difference, a distinction is made between securities credit institutions and non-securities credit institutions, the difference being registration at the Netherlands Bank. As the latter are not under the Netherlands Bank's supervision, they need the cooperation of a bank for the settlement of both their cash and their securities positions.

Trading systems

The NSC system is essentially an order-based system, which means that buy and sell orders are placed in the electronic order book and prices are determined by matching of corresponding orders. In the NSC system two different trade procedures exist: continuous trading and auction trading. The more liquid securities are continuously traded, whereby orders are directly matched in the electronic order book and price determination is a continuous process. Less liquid securities are traded in auctions. All incoming orders are collected in the electronic order book and auctioned twice a day. To enhance liquidity, Euronext Amsterdam has introduced a liquidity providing system (ELPS). For certain securities, traders act as liquidity providers, which means that they are obliged to quote prices in these securities when liquidity is low. This introduces a quote-driven element into the system. In a quote-driven system prices are determined by the quotations made by market-makers or dealers.

4.1.3 Derivatives trading

Derivative markets

Euronext Amsterdam Derivative Markets N.V. is responsible for organising trading in derivatives, a category which includes options on shares, bonds, precious metals and currencies, as well as financial

and agricultural futures. Options and futures are also traded on a number of indices, such as the AEX index, which measures the performance of 25 leading Dutch companies.

Financial intermediaries

Three main categories of intermediaries can be distinguished: brokers, traders and public order correspondent members (the last mentioned only exist on the option market). Brokers can be divided into introducing brokers and executing brokers. An introducing broker trades derivatives on account of third parties and on its own account. The orders of an introducing broker are carried out through the services of an executing broker, which executes trades on its own account or for other members. Public order correspondent members trade options through the services of an introducing broker, on their own account or on account of third parties. Traders only trade on their own account and some traders act as liquidity providers. Their main function is to ensure that quotes, in option classes assigned to them, are continuously available.

Trading systems

Contrary to the Euronext Amsterdam Stock Exchange, Euronext Amsterdam Derivative Markets is still not fully screen-based. Trading is conducted centrally either on the exchange floor on an open outcry basis or via the screen-based system, with a high level of computerisation in the area of order routing. In order to ensure that investors are always able to trade, the derivative markets require that liquidity providers provide continuous bid and offer prices, or quotes. The order routing system on Euronext Amsterdam Derivative Markets, Switch, is a system with a fully computerised order book. Orders are submitted electronically and completed transactions are confirmed in the same way. Limit orders which cannot be executed immediately can be placed in the electronic order book.

On 26 November 2001, Euronext launched a pilot project with some options categories migrating to fully screen-based trading. Due to the success of this pilot, full migration to electronic trading will be achieved three months earlier than originally planned; by the end of 2002, all the products that are quoted on Euronext Amsterdam Derivative Markets will be traded electronically. At a later date derivatives trading on Euronext Amsterdam will migrate to LIFFE CONNECT.

Trading in financial futures takes place between executing brokers and traders. Brokers and traders quote their prices and conclude transactions. Traders and brokers also specify the number of contracts covered by the prices they quote. Prices are quoted in competition with other traders. Trading in financial futures is fully screen-based.

Trading on the agricultural futures market also takes place (since August 2002) through a fully screen-based system. Investors can buy and sell futures on potatoes and pigs, or trade options having potato futures as their underlying instrument. In terms of volume, the Amsterdam agricultural futures market was Europe's second largest exchange for agricultural products in 2000.

Euronext Amsterdam Derivative Markets also allows professional parties to conclude options contracts outside the central market and still present them for settlement at the Exchange. These are referred to as OTC (over-the-counter) transactions. In the Euronext Amsterdam Derivative Markets these OTC transactions are referred to as professional (or "Prof") transactions. These contracts must fully comply with the Exchange's standard specifications with regard to maturity, underlying instrument and exercise price. In the "Prof" system, transactions are settled in the same way as Exchange transactions. Contracts on the OTC market are negotiated by the market participants in bilateral consultations. On the OTC market, there is more choice and flexibility.

4.2 Clearing

4.2.1 Integrated clearing in Clearnet

Since 1 February 2001, the clearing functions of the three Exchanges have been centralised at Clearnet SA, the clearing house of Euronext Paris, with branches in Brussels and Amsterdam (Clearnet Amsterdam Branch).

Assets and liabilities of the national clearing systems have been transferred to Clearnet SA, which became the central counterparty (CCP) to all transactions on all Euronext exchange floors. The software (Clearing21) combines clearing functions for equities and bonds with clearing functions for

derivatives (integrating positions and risks on different markets). Clearing21 is used in Brussels and Paris and has been in use in Amsterdam for the securities market since 25 October 2002. Prior to that date, the national clearing system was in use. With regard to the options market, Euronext plans to complete the integration of the clearing institutions by the end of 2003.

4.2.2 Securities clearing

In Amsterdam, there are separate clearing institutes for securities and derivatives. These are subsidiaries of Euronext Amsterdam Clearing & Depository and are called Euronext Amsterdam Stock Clearing and Euronext Amsterdam Derivatives Clearing (since 1 February 2001 operating as Clearnet Amsterdam Branch). In both cases, Clearnet acts as the CCP and guarantees the settlement of transactions. Settlement of securities takes place on a net basis at Necigef, which is now a subsidiary of Euroclear. OTC transactions can be settled immediately on a gross basis, either through the clearing institute or through the Trade-for-Trade facility offered by the Netherlands Bank and Necigef.

Clearnet organises the clearing and settlement of all retail transactions and part of the wholesale transactions on the Stock Exchange.

Through the trading day (since October 2002), trades are automatically entered into the securities clearing systems. Clearnet becomes the counterparty to both parties to a transaction as soon as the trade has been processed and transaction confirmation reports have been sent to the clearing members. By placing itself between the two parties, Euronext Amsterdam Stock Clearing guarantees the completion of every transaction.

Clearing member structure

Clearing is based on a layered clearing member structure: the clearing organisation forms the top layer, the clearing members are in the layer below, followed by the admitted institutions and by their customers. In principle, the clearing organisation deals with the clearing member only and the clearing member in turn deals with the admitted institution, and the institution with its customers, etc. This is also referred to as the principal-to-principal relationship.

Participating clearing members may become a general clearing member or direct clearing member. Direct clearing members are only permitted to clear transactions for their own customers or for themselves. General clearing members can also settle transactions on behalf of other exchange seaholders, which in turn have their own customers.

4.2.3 Options clearing

Clearnet organises the clearing and settlement of all derivatives transactions.

At the end of the trading day, trades are transmitted via an automatic link from the options market systems to the derivatives clearing system. As soon as options clearing has processed the trades and sent transaction confirmation reports to clearing members, it automatically becomes the clearing member's counterparty. The clearing member's position with Clearnet is held by an affiliated bank or stockbroker. Clearing members acting for market-makers hold a position on behalf of their affiliated market-makers.

Clearing members

Similarly to securities clearing, options clearing is based on a system of clearing members. Clearing members are exchange seaholders and must meet special requirements in the areas of expertise, risk management and capitalisation. Their responsibility is to settle transactions for their own account and for third parties. Seaholders which are not clearing members have to make arrangements with a clearing member for the settlement of their transactions.

Clearnet guarantees that every transaction it accepts will be completed (by virtue of its principal-to-principal relationship with clearing members). It acts as the counterparty to every buyer and seller. Clearing members give their customers the same guarantee. Clearnet requires collateral for positions in options and futures, as stipulated in a set of risk management rules. Margin requirements are a vital aspect of this system, providing a buffer against the risks involved in options and futures trading.

Professional parties qualify for special arrangements, which are geared to the specific needs of the OTC market in options. Under the terms of the "Prof" regulation, for example, contracts with the same

specifications as exchange-traded contracts can be traded OTC and still be presented to the Exchange for clearing.

Clearing and settlement of commodities market transactions takes place through the EA Commodity Clearing, formerly known as NLKKAS, which combines a clearing house function with a clearing member function.

4.3 Settlement

4.3.1 Integrated settlement in Euroclear

Settlement involves the transfer of ownership of securities. For the time being, Euronext settles securities at the local CSDs. Furthermore, cash settlement takes place in central bank money in the country where the clearing member involved is headquartered.

In order to create a single platform for both clearing and settlement, a joint venture is planned between Euronext and Euroclear aimed at centralising all settlement and depository functions for cash, equities, bonds and derivatives, in a single system within the Euroclear corporate structure. Euroclear is an ICSD which has taken over the national CSDs and which settles transactions involving international and domestic securities using a network of local correspondents for both money and securities settlement. Euroclear does not act as a CCP. Euroclear is to provide settlement in central bank as well as in commercial bank money.

The French CSD, Sicovam, merged with Euroclear at the beginning of 2001. Since 30 April 2002, 100% of Necigef's shares have been in Euroclear's hands. The Belgian CSD, CIK, has concluded an agreement with Euroclear as well.

4.3.2 Securities settlement

Transactions in securities can be settled in two different ways: via the netting system or via the Tft facility.

Exchange settlement

The vast majority of all settlements at Clearnet are processed using the netting system. Settlement consists of the delivery of the relevant securities to the Stock Clearing, which delivers the securities to the designated recipient. The Stock Clearing determines the amount of the different securities that each clearing member should deliver or receive and determines the countervalue in euros of every delivery or receipt. At the end of the day, all positions held at the Stock Clearing are netted. Transactions are settled on a net basis on T+3, ie on the third trading day after the transaction. The Stock Clearing also initiates cash settlement between the deliverer and recipient. Settlement vis-à-vis the common counterparty takes place on a DVP basis. Money transactions in euros are handled by the Netherlands Bank. In 2001, the volume of these settlements amounted to 10,426 for the Stock Clearing and 1,409 for the Derivatives Clearing. The exchange transactions can be conducted from 21:00 until 17:30.

Off-exchange settlement

In addition to the settlement of on-exchange transactions and free-of-payment transfers, Necigef offers a facility for DVP settlement of off-exchange transactions, called Tft (Trade-for-Trade), in cooperation with the Netherlands Bank. Each transaction is settled individually. Securities are transferred between accounts kept at Necigef, while funds transfers are made in real time via the accounts held by the relevant Necigef participants at the Netherlands Bank. As transfers made in Necigef and in TOP are final and irrevocable, there is no counterparty risk. In 2001, the Netherlands Bank settled 1.5 million Tft transactions with a total value of EUR 890 billion. Tft transactions can be made between 20:30 and 22:00 and 7:00 and 15:30.

4.3.3 Central securities depository - Necigef

The Dutch CSD, Necigef, is a part of Euronext Amsterdam's operations. The depository is responsible for book-entry transactions and the custody, management and administration of all kinds of securities

on behalf of Necigef participants. When banks deposit securities held by their customers with the depository, book-entry positions appear which make it possible to settle securities transactions by book-entry transfer. When the depository declares that securities have been admitted to the book-entry transfer system, these securities are governed by the Dutch Securities Giro Act. This means that the investors in those securities are joint owners of the securities in the system and their ownership rights will not be affected if their bank or the depository goes into receivership. Consequently, there is no counterparty risk in this settlement system.

The vast majority of all Dutch securities are registered at Necigef. In December 2001, the total number of issuers registered was 2,884. Securities and bonds in custody accounted for a total value of EUR 820 billion (securities valued at market price and bonds at nominal value). The sharp fall in physical securities movements and the need to improve efficiency have led many issuers to eliminate physical certificates (dematerialisation). This is often done by replacing the original certificates with a single global note. The adaptation of the Securities Transfer Giro Act in November 2000 made full dematerialisation possible for the first time. The shift from bearer securities to book entry-type securities now has a legal basis.

Necigef is linked to CSDs in Austria, Belgium, Finland, France, Germany, Switzerland and the United Kingdom.

4.3.4 Credit and liquidity risk management

Credit and liquidity risks are mainly controlled by margin requirements applicable to the participants and by the involvement of the Netherlands Bank as collateral manager, liquidity provider and settlement bank.

Collateral requirements

In order to secure the settlement of transactions, Clearnet requires clearing members to provide collateral for the fulfilment of margin obligations and as a contribution to the clearing fund.

The clearing organisation acts as the CCP in transactions. In the event of default by one of the parties, it may itself have to purchase the securities to be delivered by the defaulting party or, in the case of an obligation to purchase, to sell the purchased securities. Consequently, it is also exposed to market risk arising from unexpected price movements. To that end, it obliges clearing members to provide collateral to equalise the margins required to fulfil the financial obligations. These margins are calculated on the basis of the obligations ensuing from positions taken (initial margin) and from non-realised profits and losses (variation margin). The collateral may consist of underlying instruments (cover on Euronext Amsterdam), domestic or foreign securities, or debt instruments.

In addition to margin requirements, a clearing fund has been established, which serves as a supplementary form of guarantee. It provides a joint guarantee to the clearing members in return for which they are required to pledge securities as collateral (Tier 1 and Tier 2 assets). The clearing fund's size is computed on the basis of contributed risk.

The total clearing fund of the Stock Clearing should at least cover the price risk that arises for the clearing member with the largest position. This fund amounts to a minimum of EUR 70 million. The total clearing fund of the Derivatives Clearing is calculated on the basis of clearing members' average number of open options in a certain option fund or option series multiplied by a fixed amount per contract. The clearing fund of the Options Clearing has no minimum level and currently stands at EUR 300 million.

The Netherlands Bank's involvement

Settlement bank

The Netherlands Bank acts as a settlement bank for Euronext Amsterdam Stock and Derivatives Clearing. Every working day, early in the morning, the Netherlands Bank settles the outcome of both clearing processes in TOP. As mentioned above, off-exchange transactions are settled on a gross basis at the Netherlands Bank as well.

Management of collateral

The Netherlands Bank manages the collateral for both Euronext Amsterdam Stock Clearing's and Derivatives Clearing's margin obligations as well as for both clearing funds. Clearing members meet their margin requirements by means of a guarantee based on collateral deposited at the DNB in the form of book-entry securities. Banks keep their collateral - which can be used for exchange-related purposes, but also for Eurosystem monetary policy operations and intraday credit for payment purposes - on a collateral account at the Bank.

Guarantee model

The Netherlands Bank, in collaboration with Clearnet, introduced the so-called "DNB offer" or "guarantee model" on 22 January 2002, as an extension to its collateral management function. Under this model, clearing members with branches in other Euronext countries can meet their collateral requirements by a guarantee based on collateral deposited centrally in one of the Euronext countries. This enhances the efficiency of their liquidity management, as they do not have to allocate collateral for the exchange under different jurisdictions. The information about the respective amounts of the Margin and Clearing Funds are transmitted to Clearnet Paris. The Netherlands Bank differs from the other central banks involved in that the Bank freezes every morning exactly the amount it receives from Paris for the trades of the coming day.

Liquidity arrangement

In the event that a clearing member can no longer meet its settlement obligations, a liquidity problem arises at Clearnet, which has to be resolved as though it were a potential systemic risk. Although Clearnet has sufficient collateral - under the margin and clearing fund structure - to bear the financial consequences, it would need a large amount of cash at short notice in order to complete the settlement of funds transfers with clearing members before the exchange opens. To that end, the Netherlands Bank provides intraday liquidity, one of the fundamental requirements set by the overseer in the context of risk management, up to a maximum value of EUR 68 million. In the event that overnight liquidity were required, this would be provided by Clearnet.