

**Payment systems in
Germany**

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List of abbreviations

AZV	Cross-border payments procedure (via correspondent banks) - <i>Auslandszahlungsverkehr</i>
BaFin	German Federal Financial Supervisory Authority - <i>Bundesanstalt für Finanzdienstleistungsaufsicht</i>
BBankG	Bundesbank Act - <i>Bundesbankgesetz</i>
BLZ	Bank sort code - <i>Bankleitzahl</i>
BörsG	Stock Exchange Act - <i>Börsengesetz</i>
BSE	Paperless cheque collection procedure/cheque truncation - <i>Belegloser Scheckeinzug</i>
BSI	Federal Agency for Security in Information Technology - <i>Bundesamt für Sicherheit in der Informationstechnik</i>
DEA	Data input and output system - <i>Daten-Eingabe- und -Ausgabe-System</i>
DTB	German Futures and Options Exchange - <i>Deutsche Terminbörse</i>
EADK	Electronic order placing, data transmission and account information - <i>Elektronische Auftragserteilung, Datenauslieferung und Kontoinformation</i>
EAF	Euro Access Frankfurt - <i>Elektronische Abrechnung Frankfurt</i>
EDIFACT	Electronic Data Interchange for Administration, Commerce and Transport
EDM	Electronic data media
ELS	Euro Link System - <i>Elektronischer Schalter</i>
ELV	Electronic direct debit system - <i>Elektronischer Lastschriftverkehr</i>
EMZ	Retail Payment System (see RPS) - <i>Elektronischer Massenzahlungsverkehr</i>
Eurex	European exchange (common futures and options market of the German and Swiss stock exchanges) - <i>Gemeinsamer Terminmarkt für Finanzderivate der deutschen und schweizerischen Börse</i>
FWB	Frankfurt Stock Exchange - <i>Frankfurter Wertpapierbörse</i>
GSE	Large-value cheque collection procedure - <i>Großbetrag-Scheckeinzugsverfahren</i>
GZS	Payment transaction company for the German banking sector - <i>Gesellschaft für Zahlungssysteme mbH</i>
HÜST	Trading Supervision Authority - <i>Handelsüberwachungsstelle</i>
HVRZ	High-availability computer centre - <i>Hochverfügbarkeitsrechenzentrum</i>
ICS	Information and control system - <i>ISS; Informations- und Steuerungssystem</i>
KWG	Banking Act - <i>Kreditwesengesetz</i>
MaH	Minimum requirements for the trading activities of credit institutions - <i>Mindestanforderungen an das Betreiben von Handelsgeschäften</i>
MVS	Multiple virtual storage (mainframe operating system)
RPS	Retail Payment System - <i>Elektronischer Massenzahlungsverkehr</i> (see EMZ)
RTGS ^{plus}	Real-time gross settlement system of the Deutsche Bundesbank with liquidity-saving elements (also the German TARGET component) - <i>Das Bruttozahlungssystem der Bundesbank mit liquiditätssparenden Elementen (gleichzeitig deutsche TARGET-Komponente)</i>
RTS	Real-time settlement
SDS	Same day settlement
STD	Standard settlement
VPN	Virtual private network
WpHG	German Securities Trading Act - <i>Wertpapierhandelsgesetz</i>
XETRA	Exchange Electronic Trading (electronic spot trading system of Deutsche Börse AG) - <i>Elektronisches Kassa-Handelssystem der Deutsche Börse AG</i>
ZKA	Central Credit Committee of the German banking associations - <i>Zentraler Kreditausschuss</i>

1. Institutional aspects

1.1 The general institutional framework

1.1.1 Legal requirements and public bodies

According to Section 1 (9) of the German Banking Act (KWG) of 1961, last amended in 2001, the “provision of cashless payment and clearing operations (giro business)” is a banking activity. As such it requires a licence from the German Federal Financial Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht; BaFin), provided that the permission to conduct payment transactions is not based on special laws, as is the case for the Deutsche Bundesbank. A bank is a company which conducts banking transactions professionally or to an extent that requires a commercially organised business. Hence, non-banks are not allowed to handle cashless payment transactions.

The responsibilities and powers of the German central bank are laid down in the Bundesbank Act (BBankG) of 1957 (amended on 22 March 2002, entered into force on 30 April 2002). According to Section 3 of the BBankG, the Deutsche Bundesbank shall arrange for the execution of domestic and international payments. Furthermore, it is now explicitly stated that the Deutsche Bundesbank shall contribute to the stability of payment and clearing systems. In addition, the tasks of the ECB with respect to payment systems are mentioned in Article 105 (2) of the Treaty establishing the European Community (Treaty) as well as in Articles 3 and 22 of the Statute of the European System of Central Banks and of the European Central Bank (Statute).

Within the limits of antitrust law, the German banking sector coordinates the organisational and technical procedures through the Working Group of the Central Credit Committee of the German banking industry (Arbeitskreis des Zentralen Kreditausschusses; ZKA) in order to ensure the efficient, fast and secure handling of payment transactions. The handling of payment transactions between banks and networks is contractually regulated in various conventions and agreements.

The relationship between a bank and its customers is based on the General Business Conditions of the banks and/or of the Deutsche Bundesbank.

According to the Act against restraints of competition of 1966 (Gesetz gegen Wettbewerbsbeschränkungen), contracts or resolutions on the uniform regulation of the handling of payment transactions are to be reported to the Federal Cartel Office through the BaFin, stating reasons. Both of these offices have the task of ensuring that unwanted developments relating to banking supervision and excessive restraining effects on competition are avoided. In particular, they must ensure that the regulations do not unilaterally disadvantage other parties involved in payment transactions, namely the banks' customers. If no report is made, the relevant agreements or resolutions are invalid.

1.1.2 Credit Transfer Act and other specific regulations relating to payment services

With the Credit Transfer Act (Überweisungsgesetz), which came into effect on 14 August 1999 for cross-border credit transfers to countries of the European Community (EC) or the European Economic Area (EEA) and on 1 January 2002 for domestic credit transfers and credit transfers to third countries, Directive 97/5/EC was incorporated into German law and a new legal foundation was created in the German Civil Code (Sections 675-676g).

The regulation provides a new legal basis in the form of specific rules for credit transfers, payment and giro agreements. The law establishes three new legal relationships in the form of different contracts: between the originator of a credit transfer and the accepting credit institution there is the credit transfer agreement, between the processing credit institutions a payment agreement, and between the beneficiary and its credit institution a giro agreement.

According to the Act, a credit institution has transparency obligations to its customers, eg to provide information about the execution time, prices, other costs of each credit transfer and other relevant details. Also, credit transfers have to be effected within certain time limits: domestic in-house transactions have to be credited within one bank business day, domestic transactions to other credit institutions within three bank business days, and transactions within the EC and the EEA within five bank business days. The beneficiary's credit institution has another day to credit the customer's

account. Other international transactions have to be effected as soon as possible. This term is being used because of the various existing business relationships with third countries.

The Credit Transfer Act contains various regulations with regard to consumer protection. If a credit institution accepts a credit transfer and it is carried out late, the accepting credit institution has to pay interest which amounts to the base rate according to the German Civil Code plus 5%. If the transfer gets lost, a "money back guarantee" applies for amounts up to EUR 12,500 plus interests and charges. Other liabilities are unaffected by this Act. If the transaction is carried out as an "OUR" transfer (ie fees are to be borne by the originator of the payment only), the credit institution also has to refund any double-charging either to the originator or beneficiary. In Germany, the independent body dealing with customer complaints referring to the Credit Transfer Act is the Deutsche Bundesbank, which established the Arbitration Board for Credit Transfers.

Moreover, the Cheques Act of 1933 must be observed for the collection of cheques.

Of particular importance for electronic payments are the agreements relating to the conversion of paper-based transfers and the processing of electronic transfers (the Agreement on Credit Transfers, which came into force on 1 January 1999), cheques (the Agreement on Cheque Collection of 7 September 1998) and direct debits (the Agreement on Direct Debits of 1 January 1999), which regulate the relationships of banks with each other and with the Deutsche Bundesbank.

1.2 The role of the central bank

1.2.1 Oversight of payment systems

Oversight is an important role assumed by the Bundesbank in the field of payment transactions. This task is clarified with the latest amendment to Section 3 of the BBankG and is also recognised by the Treaty and the Statute as a basic task of the Eurosystem. Its aim is to ensure smooth payment transactions and encourage efficiency and security.

In practical terms, this function is exercised largely by means of the general agreements on procedures and standards jointly developed with the banking sector and via institutionalised dialogues in various official bodies. Moreover, the Deutsche Bundesbank itself offers services in the field of payments and processing and thus assumes an operational function. Additionally, the Bundesbank carries out a statistical survey on payment services every year, which has to a certain extent been of limited scope and on a voluntary basis so far. To improve the data - an important basis for the performance of the oversight role - the Bundesbank is considering implementing a statistical regulation in the near future. Such a regulation would entitle the Bundesbank to collect statistics from all credit institutions in Germany.

In exercising the oversight function, close cooperation between the bodies overseeing payments and the BaFin is of fundamental importance. In the field of electronic money the Deutsche Bundesbank also cooperates with the Federal Agency for Security in Information Technology (BSI) and takes advice from this body, as systems with electronically stored units of value are subject to a special security test.

The legal foundation for banking supervision is the KWG. The aim of this law is to safeguard the ability of the banking sector to function and protect creditors by monitoring the credit standing and liquidity of banks. The law aims to achieve this objective by respecting the principles of a market economy. Under the KWG, the supervision of banks is primarily the task of the BaFin, which, however, performs this task in cooperation with the Deutsche Bundesbank. The Deutsche Bundesbank is above all involved in the ongoing supervision of banks and in analysing reports and notices from banks. In addition, however, it is involved in quality control in connection with the minimum requirements for the trading activities of credit institutions (MaH) and internal risk models.

1.2.2 Payment systems of the Deutsche Bundesbank

Continuing the tradition of the former Reichsbank (ie its explicit mandate to handle payment transactions), the Deutsche Bundesbank is actively involved in processing payments, with the aim of achieving the following goals:

- an adequate share of cashless payments in general;

- the promotion of large-value payments in particular;
- subsidiary participation in retail payments;
- the provision of payment systems/services which are neutral with respect to competition;
- the promotion of safe and efficient procedures; and
- contributing to a reduction in processing times.

The Deutsche Bundesbank fulfils its statutory task of ensuring the processing of domestic and international payments by providing a neutral giro network available to the banks in the various banking groups and offering its services in the area of cashless payment transactions to holders of Deutsche Bundesbank accounts in 118 branches and seven computer centres and two payment transaction points (as at year-end 2002). Banks have the option of using the Deutsche Bundesbank's facilities instead of private giro networks or groups of banks.

Against the backdrop of the close connection between the implementation of monetary policy and the processing of payments through the central bank, the Bundesbank pays particular attention to the encouragement of large-value payments. These payments are processed through RTGS^{plus}, which at the same time provides a connection to the TARGET system. Together with the banking sector, the Deutsche Bundesbank developed this new liquidity-saving large-value euro payment system, combining the features of the two previous large-value payment systems, the Euro Link System (ELS) and the liquidity-saving hybrid system Euro Access Frankfurt (Elektronische Abrechnung Frankfurt; EAF), to form one single real-time gross settlement system, which can be used for both domestic and cross-border payments in euros. It went live on 5 November 2001. The EAF was closed at this time, whereas the ELS will still be operated mainly as a communication channel to RTGS^{plus} until the end of 2004. The new system is a means of gaining electronic access to the Deutsche Bundesbank, which has provided for this kind of access since 1990.

In addition, the Bundesbank also offers an electronic procedure intended specifically for the handling of mass payments (credit transfers, cheques and direct debits), namely the Retail Payment System (RPS).

(The principal features of the above-mentioned payment systems of the Deutsche Bundesbank are described in Section 3.)

Apart from operating national payment systems with a European linkage to TARGET, the Bundesbank also processes cross-border and cross-currency payments via AZV (Auslandszahlungsverkehr; Cross-border Payment Services). For this reason it holds bilateral accounts with credit institutions abroad. Since March 1995, banks have also been able to process incoming and outgoing cross-border payments via the correspondent banks of the Deutsche Bundesbank using data telecommunication and floppy disks. In Germany, cross-border payments are processed using the same technical components as those of the ELS. Additionally, the Deutsche Bundesbank provides the cross-border payment service MASSE, which is used for recurring payments especially on the part of the government to other countries, eg pension payments.

1.2.3 Settlement

A prerequisite for using the facilities offered by the Bundesbank for cashless payments is a current account with the Bundesbank.¹ The Bundesbank manages current accounts for banks and public authorities and, in exceptional cases - with a limited range of services - also for companies and private individuals. Apart from the minimum reserve balances, current accounts with the Deutsche Bundesbank do not bear interest and are run on a credit basis only. In accordance with the cover principle laid down in the BBankG, payment orders are only executed if sufficient cover is available.

In order to avoid a delay in the processing of payments in the course of the day, the current accounts may be overdrawn up to the amount of collateral existing within the framework of the marginal lending facility; in addition, cover for outgoing transfers may be provided through the crediting of credit notes for the collection of both cheques and direct debits.

¹ RTGS^{plus} remote participants only need an RTGS^{plus} account.

Debit balances at the end of a business day (resulting from intraday credit granted by the Deutsche Bundesbank) are not admissible and must therefore be settled by paying in the corresponding amounts using overnight facilities.

In addition to the settlement of payments processed through the Deutsche Bundesbank's payment systems, the accounts are also used for settling balances originating from clearing arrangements outside the Bundesbank, such as "bilateral clearing" (see also Section 1.3). Such settlement transactions are processed via RTGS^{plus}.

1.2.4 Pricing policy

Like all resolutions on business policy passed by the Deutsche Bundesbank, the principles for cashless payments are laid down by the Central Bank Council of the Deutsche Bundesbank to the extent set out in ECB Guidelines and Instructions.

Pricing is based on the cost covering principle. The Deutsche Bundesbank supports efficient procedures, for example by charging higher fees for the more complex exchange of data media than for submissions by data telecommunication. Non-banks are charged EUR 15 per month for account management (for further information on prices see Section 3). The current accounts of banks are managed free of charge.

Through its General Terms and Conditions of Business, its processing procedures, its debit and credit conditions and pricing, the central bank controls the extent to which its cashless payment systems are used. In addition, it exerts a certain influence on the terms and conditions applied by banks.

1.3 The role of other private and public institutions

In the Federal Republic of Germany, both banks and the Deutsche Bundesbank supply the economy and the public with cash and process cashless payments. At the end of 2001, banks maintained a total of 87.1 million current accounts for domestic non-banks. In addition, credit card companies process payments resulting from credit card transactions via their own networks.

Most of the 2,518 legally independent banks (with 52,737 branches as at the end of 2001, including 12,793 run by Deutsche Postbank AG) are actively involved in processing payments. Within the framework of the existing universal bank system, these banks belong, with a few exceptions, to one of the following three banking groups, each of which provides giro networks² specific to each group in the form of coordinated bilateral clearing and settlement arrangements:

- commercial banks, many of which have established important internal networks of their own;
- 534 savings banks, which form their own giro network together with their 13 central institutions; and
- 1,621 credit cooperatives, which form their own giro network together with their two central institutions.

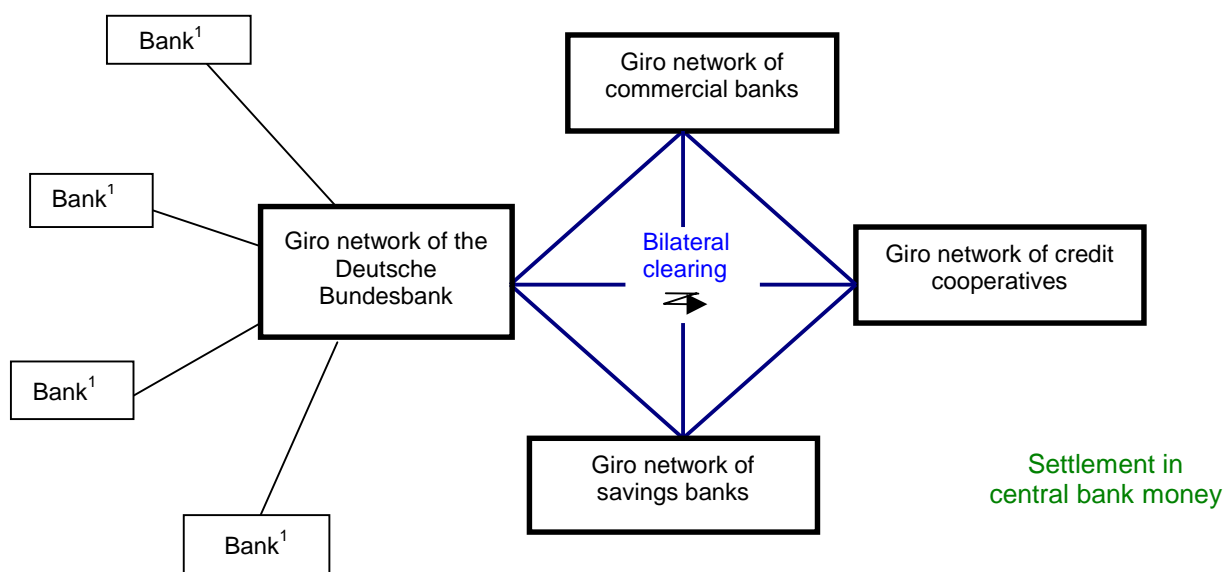
The Bundesbank is in practice the only means - other than relying on their competitors - for smaller private banks without a giro network of their own to execute payments intended for other banks on behalf of their customers.

Since 1982 a combined private national payment transaction company has existed for the German banking sector, Gesellschaft für Zahlungssysteme mbH (GZS). This is an independent processing company which ensures the low-cost handling of card-protected payments and develops new electronic payment systems. The main card systems involved are Eurocard, Visa and debit card systems. GZS customers are banks and trading firms, with commercial banks and savings banks each holding 40%, and cooperative banks 20%, of the company's equity capital.

² The term "giro network" refers to payment procedures which are used within one banking group or within a bank's branch network. Settlements are effected by one or more of the banking group's central institutions.

Giro networks in the Federal Republic of Germany

(for credit transfers, cheques and direct debits)



Note: This diagram provides only an overview of the connections between the various giro networks. Not all bilateral relationships are shown.

¹ Banks without a giro network of their own and/or not using private giro networks.

2. Payment media used by non-banks

2.1 Cash payments

The euro is the German currency and was introduced on 1 January 1999. At that time it only existed as book money or as electronically stored units of value, with banknotes and coins continuing to be denominated in DEM. After its introduction as cash on 1 January 2002 the euro became the only legal payment medium in Germany; nevertheless, the DEM, which was the only legal payment medium until then, could still be used until the end of February 2002 according to an agreement between the Deutsche Bundesbank, the ZKA and the German retailer association. The German banknotes and coins in circulation could be exchanged cost-free at banks at least until this date; thereafter the Deutsche Bundesbank guarantees the exchange of DEM to the new currency. Banknotes are available in seven denominations (EUR 5, 10, 20, 50, 100, 200 and 500) and the coins in eight (1, 2, 5, 10, 20 and 50 cents and EUR 1 and 2). The German 1, 2 and 5 cent coins have an oak leaf on the back, the other cent coins a picture of the Brandenburger Tor in Berlin, and the euro coins the eagle as the German heraldic animal. In addition, there are very small quantities of DEM 10 coins, although these are primarily for collectors and therefore rarely used in payment transactions. Banknotes and coins are legal tender, although there is no obligation to accept more than 50 coins, or in the case of commemorative coins no more than EUR 100. At the end of 2001 total currency in circulation - including cash in bank vaults - amounted to EUR 82.9 billion, of which EUR 76.5 billion was in banknotes (92.3%) and EUR 6.4 billion in coins (7.3%). Cash in bank vaults amounted to EUR 14.9 billion.

Although the share of card-based payments is rising continuously, cash payments still amounted to 68.8% of the value of all retail payments in 2001.

2.2 Non-cash payments

In Germany, cashless payments are effected by means of credit transfers (49.8% of the total number of cashless payment transactions in 2001), cheques (2.3%) and direct debits (36.4%). The usage of

debit and credit cards is steadily increasing, reaching in total a share of almost 11.3%. Other types of payment, such as special payment instructions via Deutsche Postbank AG, but also payments made with prepaid cards, are relatively insignificant (less than 1%).

2.2.1 Credit transfers

In Germany, credit transfers have traditionally been the predominant form of payment transaction. However, their share of the total volume of payment transactions has decreased in recent years because more suitable payment instruments, especially direct debits, are being used for certain purposes (eg for the collection of identical payments due on a regular basis).

For payments recurring on a regular basis (eg rent payments) the bank customer also has the possibility of giving his bank instructions to set up a standing order; this bank is then responsible for monitoring the timely execution of transfers (eg on the last day of the month).

Those customers who instruct their bank to make periodically recurring retail payments (eg salaries, wages, social benefits) are requested to submit their orders to the banks via electronic data media (magnetic tape or diskette). Increasingly, these payments are now being handled via data telecommunication, not only between banks but also between banks and their customers.

In 2001, as many as 7.0 billion credit transfers were processed by the German banking industry. 460.1 million of them were submitted via PC or terminal from customers to their bank. As the number of internet-linked accounts increases in Germany as well as customer acceptance of using the modern communication infrastructure for accessing their banks, this number is expected to increase further.

According to the Credit Transfer Agreement between the central associations of the German banking industry and the Deutsche Bundesbank, every credit transfer has to be processed in a fully automated and paperless form in interbank clearing and settlement by credit institutions. Thus, accepting institutions have the obligation to convert credit transfers from a paper-based to a paperless form.

2.2.2 Cheques

In Germany, the cheque has never become as important as it has in many other countries of the western world. In terms of numbers it accounts for a mere 1.3% of all cashless transactions, in terms of value just 2.7%. It is used for only 0.1% of all payments at retailers. On account of the increase in more efficient debit card payments, the importance of the cheque is steadily decreasing. A further decline in cheque payments in retail business can be expected as the eurocheque guarantee ceased at the end of the year 2001. Although the number and value of cheques have declined in the past years, they are nevertheless still active in business life.

Under the German Cheques Act, the drawee bank may not certify a cheque in such a way as to signify that it undertakes to honour it. The purpose of this prohibition is to prevent cheques acquiring a function similar to that of banknotes. An exception is made for "certified cheques", which are drawn on the Deutsche Bundesbank. On request by an issuer with sufficient cover, the Bundesbank will certify such cheques. The liability arising from the certification lapses if the cheque is not presented for payment within eight days of the date upon which it is drawn.

With the automation of cashless payment transactions, the fact that a cheque is a payment instrument which is payable at sight has proved to be one of its key disadvantages. In other words, cheques must always be collected and presented in paper-based form. In 1985, the central associations of the German banking industry and the Deutsche Bundesbank agreed on a paperless cheque collection procedure (formerly called the BSE Agreement, now part of the Cheque Agreement), while deliberately waiving the statutory obligation to physically present cheques. The handling of BSE cheques (since 2002 cheques below EUR 3,000) is fully automated and, in interbank transactions, entirely electronic, whereas GSE cheques (large-value cheques for amounts of EUR 3,000 or more since 2002) are still physically presented to the drawee banks.

2.2.3 Direct debits

The direct debit, introduced by the banking industry in 1963, has considerably simplified the collection of periodically payable monetary claims (subscriptions, fees, taxes, etc). Today around 36.4% of all cashless payments of non-banks in Germany are effected by direct debit. Its relative importance

compared with other payment instruments is increasing, especially as debit card payments (another 8.7%) are processed as direct debits as well.

Unlike credit transfers, direct debits are initiated by the payee, which thereby ensures that its claim on the payer is fulfilled on time. However, this presupposes that the payer preauthorises the payee to collect payment (collection authorisation) or, by agreement with the payee, authorises its bank to debit its account in accordance with direct debit requests issued by that particular payee (debit authorisation).

Bank customers who have IT systems are expected to submit their direct debits for collection to the bank in electronic form only, ie on magnetic tape or diskette. Any remaining direct debits which are still paper-based - collection of this kind is quite expensive for bank customers - are converted into data records by the first-collecting institution, eg by means of inputting via terminals or scanning systems. In November 1993, the direct debit became the first payment instrument to be fully automated as part of the general conversion obligation introduced on the basis of the Direct Debit Agreement, and since then it has been handled in wholly paperless form in interbank transactions.

2.2.4 Card payments

The use of cards for retail payments is increasing steadily. Debit card payments account for 21.2% (electronic cash 5.4%, electronic direct debit system (ELV) 11.9%, and point of sale without payment guarantee (POZ) 3.9%), credit cards for 4.5% and retailer cards for 1.4% of the total value of retail payments.

2.2.4.1 Debit cards

Payment cards in the form of debit cards are usually issued by banks as bank cards with which customers may also draw on their account balances outside their bank (eg cashless payments at automatic cashpoints, withdrawals at cash dispensers).

Bank cards as payment cards have evolved since their introduction as guarantee cards for eurocheques (ec cards) and their main function today is for electronic payments at payment terminals. With the rapid growth of card payments at payment terminals in shops, etc, the banking sector has also added the payment function to another kind of card issued by a bank or banking association itself in order to provide customers who could not obtain an ec card, for example on account of their credit rating, with a means of accessing electronic self-service media. The number of these cards which can be used at payment terminals grew rapidly in the past decade and today the majority have a payment function. With the abolishment of the eurocheque guarantee there is no longer a difference between the two kinds of bank cards.

In the recent past many card issuers have extended the range of tools available on debit cards. A chip on the card makes offline authorisation of guaranteed card payments possible. In addition, bank cards can be used as prepaid cards (the GeldKarte system of the ZKA).

As a consequence of the merger between the Europe-wide edc (European debit card) service and the worldwide Maestro system, since the beginning of 1998 many POS terminals and cash dispensers throughout the world have been available to holders of ec cards with the Maestro logo.

Recently, debit cards have been issued as Visa cards using the infrastructure provided by Visa. So far these Visa debit cards are not as widespread as bank cards.

No special system exists for the clearing and settlement of debit card transactions with bank cards. These payments are handled like direct debits.

The usage of debit cards for guaranteed payments and withdrawals is usually limited according to varying restrictions of the card-issuing institution. The limitation is usually weekly, including all tools and with various sub-limits for every tool, eg a limit for cash withdrawals per day.

Electronic cash

After many years of negotiations, the banking sector concluded the agreement on an interbank system of cashless payment at automatic cashpoints (electronic cash system) in February 1990. This makes it possible to have a uniform POS system on the basis of debit cards. Under this system cardholders can pay for goods and services by debiting their accounts at the corresponding acceptance points using cards issued by the German banking sector (ec card and bank customer card) and the

matching, confidential PIN. Once customers have entered their PIN, an authorisation request is directed to the authorisation centre through the network operator. The authorisation centre checks the confidential number, the credit balance and/or credit line and the entries in a blocking file. If the answer is positive, the card-issuing bank gives a payment guarantee for the amount requested. A charge is levied on merchants for these transactions.

The terminal networks of the various and competing network operators (of which there were 30 at year-end 2001) are connected to the banking industry's centres for the authorisation of electronic payment by debit card in the electronic cash system. By the end of 2001, following a continuous increase, about 306,000 electronic cash terminals had been installed (including electronic cash offline) - mainly in petrol stations and retail outlets.

Due to the fact that bank cards will become more and more alike, the retailer's risk of rejection of card payments by banks will increase as retailers will no longer be able to distinguish the creditworthiness of their customers, if the retailers use debit card systems other than the electronic cash system. For this reason, the banking industry expects a further increase in the usage of electronic cash.

Electronic cash offline

This system, designed in cooperation with the banking industry, is based on chipcard technology and corresponds to the electronic cash system above. The only difference is the possibility of offline authorisation. An authorisation up to a certain limit laid down individually by the issuing bank is stored on the bank card's chip. This amount decreases with each payment and, as long as the remaining amount is sufficient, transactions are authorised offline. In order to pay, the customers must enter their PIN, which is validated on the chip. Online authorisation will only take place if the amount remaining on the chip is no longer sufficient or if more than 90 days have elapsed since the last online authorisation. The fees paid to the banking industry are the same as the charges above, although in 80% of cases the retailer saves telecommunication costs through offline handling.

Electronic direct debit system

The retail trade has developed a system (without consulting the banking sector) which makes payments by bank card possible without any authorisation. This system is known as the electronic direct debit system (ELV). The customer's signature on the receipt or an additional document authorises the dealer to collect the cost of the purchase by direct debit. However, the risks of a direct debit being returned on account of an objection or lack of cover, or possibly because the card has been blocked, are borne solely by the retail outlet. This means that there is no payment guarantee in this system and no extra charges are incurred. So far the risk of payment failures could be minimised because of the distinction of ec and other bank cards which gave some information about the customer's creditworthiness. Because this distinction no longer exists, the proportion of ELV payments is expected to decrease in the future in favour of electronic cash payments. The electronic direct debit system is the most frequently used card-based payment system in Germany at the moment.

Point of sale without payment guarantee

In response to the success of the ELV procedure, the banking sector introduced a further system of electronic payment using the ec card at cash terminals in addition to the electronic cash procedure. In this alternative procedure, the customer signs a debit note produced using data from the magnetic stripe. In this system the banks do not give a payment guarantee, with the result that the retailer alone bears the risk. This POS system provides retailers with a simple and inexpensive payment system without the need to enter a PIN and with a simple, fee-based online blocking check for amounts of EUR 30.68 or above.

2.2.4.2 Credit cards

The use of credit cards³ has increased in the past few years but not as significantly as the usage of debit cards. The number of cards issued by the major card organisations (American Express, Diners

³ In Germany, the term Kreditkarte is used for both charge cards and credit cards. Most of the cards referred to as "credit cards" in this book offer no possibility of obtaining credit. Periodical unit invoices have to be settled immediately on receipt. Thus, these cards are generally designated as deferred charge cards.

Club, Eurocard in connection with MasterCard, Visa) has grown from approximately 10 million at the end of 1994 to more than 18.8 million at the end of 2001. At the same time, the number of acceptance points (especially in the retail sector and the hotel business) has increased substantially. In 2001, German cardholders made payments by credit card amounting to approximately EUR 37.2 billion. In spite of this, credit cards are still used far less than other payment instruments (eg debit cards) in the Federal Republic of Germany.

Owing to the commission charges (a deduction from the credit card turnover of the acceptor, which is payable by the latter only) and the amount of work involved in the authorisation and processing of payments, credit cards are not always popular in the retail trade. Thus their use tends to be restricted to more "upmarket" retail outlets. In addition, the ec card and customer cards issued by banks provide retailers with a less expensive payment option.

Whereas GZS issued the Eurocard credit card on behalf of banks until 1989, banks now have the possibility of issuing them themselves. More and more banks now also issue Visa cards. This means that banks and credit card organisations are increasingly competing with each other. Banks use credit cards to a greater degree for cross-selling or for developing customer relationships. Various additional services (eg insurance) and bonus programmes (eg card charges depending on purchase amounts) are aimed at achieving greater customer loyalty and increased card use.

2.2.4.3 Retail cards

Retail cards with a payment function, which are issued by some major stores with the aim of increasing customer loyalty, are now competing with traditional credit and debit cards. With the largest issuer in Germany, for example, the use of retailer cards is free of charge. Cardholders can usually take advantage of a payment period of between one and two months or pay in instalments. At the end of 2001 there were around 12.6 million retailer cards with payment functions in circulation. Retailer cards provide the retail trade with exact information on customer and purchasing profiles.

2.2.4.4 Prepaid cards

At the end of 1996 the first prepaid cards were issued in Germany by the German banking sector (ZKA-GeldKarte-System) and tested in a pilot project. Since the successful test phase the number of prepaid GeldKarte cards has increased to 67.3 million. There are cards linked to accounts, where the GeldKarte chip is integrated into an ec card, as well as cards not linked to an account ("white cards"), which have only an electronic purse function. The potential of these more than 67 million chipcards with the GeldKarte feature has not yet greatly developed due to lack of acceptance from suppliers of goods and services and customers, even though the number of transactions is increasing steadily and has reached more than 30 million per year. The average value per transaction has decreased to about EUR 2, showing that the aim of usage for low-value payments is being achieved. In addition to the GeldKarte system developed by the ZKA, there were other prepaid cards which, however, were relatively insignificant and unsuccessful and subsequently discontinued their operations.

2.2.4.5 Cash dispensers

In Germany, banks offer both their own customers and the customers of other banks the possibility of obtaining cash up to a certain limit from approximately 49,620 cash dispensers nationwide (as at the end of 2001) using bank, other debit or credit cards in combination with a PIN. Credit cards can also be used at cash dispensers. For all transactions at cash dispensers an online connection to the authorisation centre of the bank concerned is established and a block and limit check is made in order to prevent fraudulent or other inadmissible withdrawals. Settlement of transactions at cash dispensers is effected by direct debit.

2.2.5 Post office services

Deutsche Postbank AG is a privatised company offering both payment services and other services through its own branches and through post offices. In addition to handling credit transfer, cheque and direct debit transactions, Deutsche Postbank AG offers its customers the possibility of sending sums of money to the home of the payee by means of a payment instruction specific to this institution.

3. Interbank exchange and settlement systems

3.1 General overview

In Germany many of the commercial banks, savings banks and cooperative banks operate their own giro networks. In addition, the Deutsche Bundesbank runs its own payment systems, which are neutral in their effect on competition and available to all banks. In contrast to a payment system, a giro network has no system owner and there are no governance arrangements. Nevertheless, as in payment systems credit transfers, direct debits and cheques are cleared solely as electronic data using the same data record standards and common procedures which allow full straight through processing by the intermediary and the receiving banks.

The giro networks of the savings and credit cooperative banks are based on bilateral agreements between the banks of the respective banking groups using the agreed standards (domestic loro/nostro arrangements), whereas the giro networks of the commercial banks can nowadays be regarded as "internal networks". The networks have evolved over several years with the aim, on the one hand, of processing payments cost-efficiently and, on the other, of keeping the liquidity within the credit institution or at least the banking groups as long as possible.

Giro network of commercial banks

The four big banks and the Deutsche Postbank are the main participants in the giro networks of the commercial banks. Each of these banks operates an internal network of its own to process payments; this network is based on its branches or subsidiaries. The head office, the branch offices and/or, in some cases, subsidiaries are linked to special processing entities (service providers) or computer centres which process the transactions and carry out the accounting. Settlement in the internal giro network of a commercial bank takes place in commercial bank money in the books held at its headquarters.

Giro network of savings banks

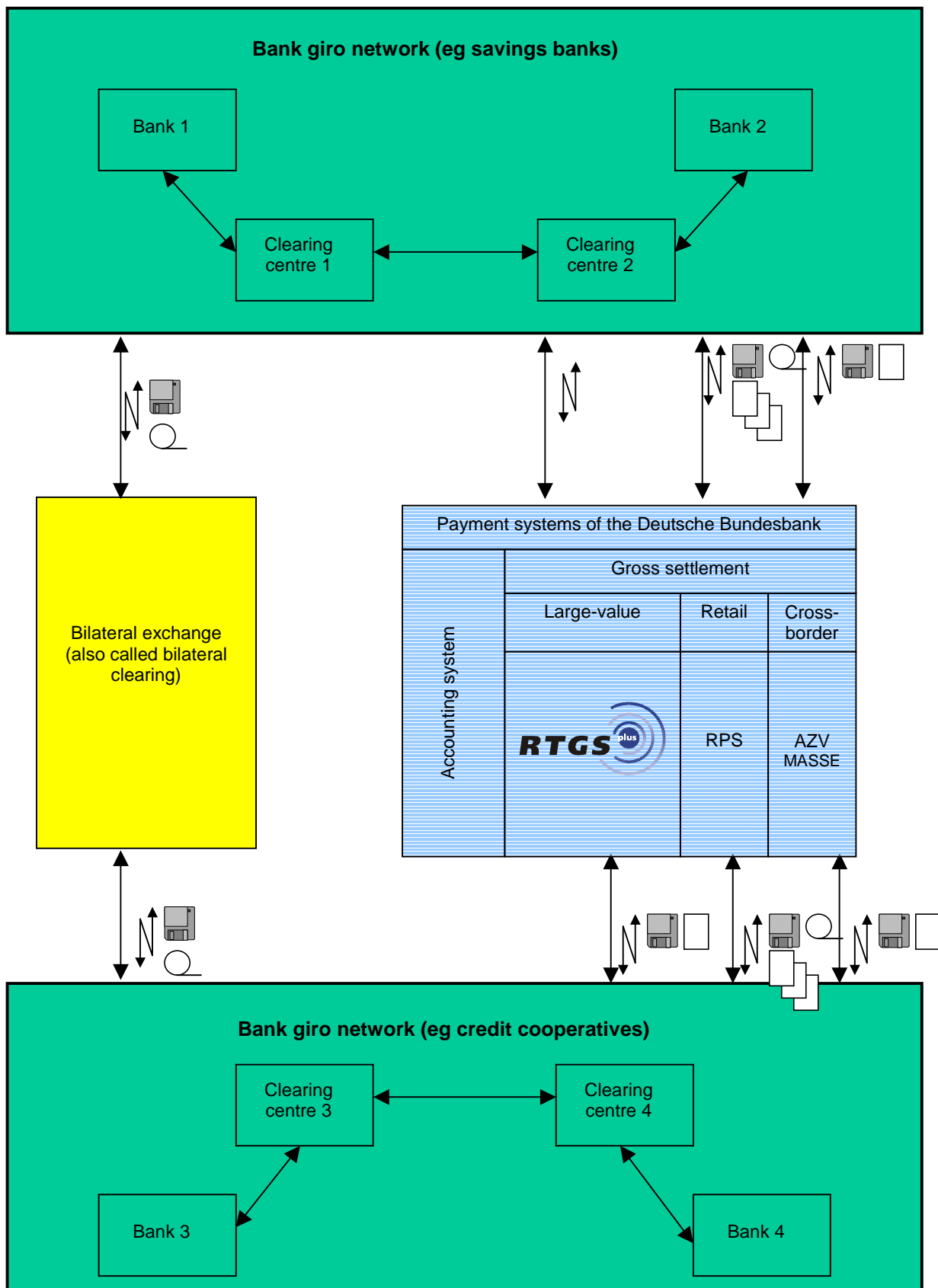
The giro network of the savings banks consists of about 530 savings banks, the Landesbanken and the central institution, DGZ DekaBank. Each savings bank maintains an account with its "regional"⁴ Landesbank (previously known as a "regional giro institution") for the purpose of exchanging payments. However, most savings banks also have direct access to the Bundesbank's payment systems via a clearing account of their own. In general, the payments are processed in special computer centres. Net positions resulting from the exchange of payments are transferred to the central institutions which then credit or debit the settlement accounts of each savings bank. The Landesbanken maintain settlement accounts for each other for the purpose of payment transfer, ie commercial bank money is used to settle on a regional basis with savings banks and nationally among Landesbanken. Cross-network payments are exchanged and cleared either bilaterally or via the Bundesbank, where settlement is always based on central bank money. It can also be assumed that urgent payments are always made via the Bundesbank's RTGS^{plus} system outside the giro network of the savings banks, since this banking group has made a commercial decision to this effect.

Giro network of credit cooperatives

The credit cooperatives sector also operates a giro network. This includes about 1,800 credit cooperative banks in Germany, one regional institution, the WGZ-Bank (Westdeutsche Genossenschafts-Zentralbank eG) and the central institution DZ Bank (Deutsche Zentral-Genossenschaftsbank). The technical processing of payments is carried out using a very similar approach to that of the savings banks.

⁴ With a few exceptions, there is one central institution per federal state in Germany.

Interbank funds transfers in Germany



RPS = Retail Payment System of the Deutsche Bundesbank.

AZV = Cross-border payments procedure (via correspondent banks) of the Deutsche Bundesbank.

All banks directly involved in payment transactions are identified either by eight digit bank sort codes (BLZ) or by their bank identifier codes (BIC codes). Branches of banks either have their own BLZ or a BLZ derived from that of their parent institution. The bank sort code is also the current account number with the Deutsche Bundesbank. Additionally, in the Bundesbank's new large-value system RTGS^{plus} (see Section 3.2), which is based on SWIFT standards for data formats, banks are addressed solely with BIC codes.

The following provisions apply to all systems operated by the Deutsche Bundesbank: the general provisions of the German Civil Code, the German Commercial Code, the Act governing General Terms and Conditions of Business (Gesetz über die Allgemeinen Geschäftsbedingungen), the General Terms and Conditions of Business of the Deutsche Bundesbank and the various payment agreements concluded between the banking industry and the Deutsche Bundesbank.

3.2 RTGS^{plus}

3.2.1 General overview

With the launch of the euro on 1 January 1999, the European payments scene underwent a substantial change, necessitating a reorientation of the range of large-value payment services offered by the Deutsche Bundesbank. In these circumstances, a consolidation of the two former large-value systems of the Bundesbank, the RTGS Euro Link System (ELS) and the hybrid system Euro Access Frankfurt (EAF) appeared necessary to improve the cost situation and to benefit from synergies. Moreover, recent developments in the area of communication technology as well as additional requirements, especially on the part of larger banks, called for a modernisation of the Deutsche Bundesbank's large-value payment systems of that time. For example, the need for comfortable and effective intraday liquidity management has become more and more important. For these reasons, between 1999 and 2001 the Bundesbank created RTGS^{plus}, an integrated, liquidity-saving real-time gross settlement system. RTGS^{plus} is also the German component within the TARGET system of EU central banks. The technical concept behind RTGS^{plus}, which was drawn up in close cooperation with banks, has the following main features:

- *European orientation through open access and use of domestic liquidity*

The system is open to all credit institutions and investment firms registered in the EEA. Moreover, RTGS^{plus} keeps its own intraday accounts for settling payments. There are various flexible options for the provision of liquidity to and the withdrawal of liquidity from these RTGS^{plus} accounts ("liquidity bridge").
- *Gross system with liquidity-saving elements*

The integration of liquidity-saving elements into the gross settlement procedure of an RTGS system makes it possible for the customer to individually organise payment processing from the point of view of throughput and liquidity savings.
- *Payment system with extensive options for controlling liquidity*

Every participant in RTGS^{plus} can precisely control the use of the liquidity it makes available in accordance with its needs.
- *Online information and interactive control*

RTGS^{plus} offers comprehensive real-time information and makes it possible to change all control parameters using modern internet technology with its information and control system (ICS).
- *Use of SWIFT standards and services*

RTGS^{plus} uses internationally established SWIFT standards for data formats and payment exchange. Moreover, the new, forward-looking SWIFTNet services, based on the latest internet technology, are used for online information and interactive control.

RTGS^{plus} went live on 5 November 2001; on this date the EAF was closed down. On an average working day in December 2002, RTGS^{plus} processed more than 117,000 domestic payments and more than 17,000 cross-border TARGET payments; average turnover is about EUR 400 billion.

Customers who do not yet participate in RTGS^{plus} can continue to use the ELS, albeit as a procedure for gaining access to the Deutsche Bundesbank's large-value payment system. However, for the Bundesbank as the operator and for banks as users it would be uneconomical to operate the ELS as a parallel system in the long term. Thus, the ELS will be closed down within a further three-year period at the latest. The Bundesbank undertakes to find a way for all ELS users to participate in RTGS^{plus} in a cost-effective way by the time the ELS closes down.

3.2.2 Participants

In order to ensure that access to RTGS^{plus} is as open as possible, the Bundesbank has dispensed with size-dependent criteria for participation in the system. It is possible to address about 8,400 credit institutions as direct or indirect participants (including branches of participants).

Only credit institutions and investment firms may participate directly in RTGS^{plus}. As at year-end 2002 there were 74 direct participants. The European central depository Clearstream and the futures exchange Eurex will also be linked to RTGS^{plus} for their cash settlement.

Banks may participate indirectly. In this case, clearing will be carried out via the selected direct RTGS^{plus} participant, which is either a credit institution or the Deutsche Bundesbank. Users participating via the Deutsche Bundesbank will use the ELS as their linkage to RTGS^{plus} until it closes in November 2004 at the latest.

3.2.3 Types of transaction handled

RTGS^{plus} is a system for credit transfers in euros. Domestic and cross-border TARGET instructions may be submitted, as required, in the form of either express or limit payments. In addition, RTGS^{plus} offers the possibility of submitting orders as timed payments.

Express payments

For express payments the participant uses their complete RTGS^{plus} liquidity. The express mode is therefore especially suitable for priority payments, eg time-critical and settlement payments.

Limit payments

Alternatively, the participant may systemically control the outward flow of liquidity by defining limits and submitting orders as limit payments. Such payments are only executed if the current credit balance in RTGS^{plus} is sufficient and the maximum amount of liquidity the sender is willing to use for limit payments has not been exceeded.

TARGET payments

RTGS^{plus} is the German access point to the TARGET system of the EU central banks. With the integration of the German TARGET component into RTGS^{plus}, its service quality has much improved and thus contributes to a more efficient liquidity flow in TARGET. TARGET payments may also be submitted as limit payments.

Timed payments

Participants can tag time-critical payments ("till" payments) with a due time. Nevertheless, the RTGS^{plus} participant is still responsible for the punctual execution of the payment. But the ICS enables simple and continuous monitoring via selective access to these instructions and provides a special warning feature. In RTGS^{plus} it is also possible to set up "from" payments. The participant defines the earliest processing time of the payment.

Banks make use of RTGS^{plus} on the one hand for interbank operations, such as money market transactions and liquidity management operations. On the other hand, due to its speed, its liquidity efficiency and favourable pricing, RTGS^{plus} is widely used for urgent customer payments (share of 60% in terms of volume).

3.2.4 Transaction processing environment and liquidity control parameters

RTGS^{plus} has the advantages of real-time gross settlement systems, which are the efficient and immediate processing of payments and the immediate finality of credit bookings in central bank money. However, the new system not only processes all incoming payments quickly and securely, but also handles them in such a way as to enhance liquidity with its efficient algorithms. In this way, the system combines uniquely the elements of gross, net and hybrid systems evading credit and liquidity risks.

RTGS^{plus} intraday accounts

RTGS^{plus} holds its own intraday liquidity. Therefore direct participants transfer liquidity from their home account, which may be held at a central bank or a credit institution within the euro area, to their RTGS^{plus} account in the morning. At the end of the day, the remaining liquidity is transferred back to their specified account. During the day, liquidity can easily be transferred between RTGS^{plus} and the respective home account. This structure allows, for example, comfortable participation of foreign customers by means of remote access. Liquidity transfers may be initiated by means of the ICS and are effected via the Bundesbank or via TARGET. Customers holding an account at the Deutsche Bundesbank may also set up a standing order via the ICS for the liquidity injection in the morning.

Liquidity-saving elements

The liquidity-saving processing of RTGS^{plus} is achieved by various coordinated mechanisms. These consist mainly in three measures: immediate real-time settlement, but with consideration of mutual cover dependencies for both express and limit payments, event-oriented optimisation of the express queue and ongoing resolution of the queues through sophisticated, differentiated algorithms with comprehensive consideration of offsetting transactions, which enables efficient payment processing with strong liquidity-saving effects. The algorithms lead to minimised queues and improved throughput as well as accelerated settlement with early finality due to the efficient use of the available liquidity. This allows participants to optimise their collateral deposits.

Limit control

Limits are the most important means of managing liquidity in RTGS^{plus}. By preventing unilateral losses of liquidity, sender limits ensure that - beyond a certain threshold - RTGS^{plus} participants can only receive final payments if they are ready to submit payments themselves ("payment versus payment philosophy"). Moreover, experience shows that sender limits encourage early submission of payments and help to synchronise payment flows. The participants have flexible options for controlling their liquidity. If they do not require any control at all, they can dispense with the use of limits entirely. The next level of control is to define a total limit. This restricts the use of liquidity available for limits as a whole and reserves the liquidity above for express payments. Additionally, fine control of liquidity can be achieved by defining bilateral sender limits, which is participant-related, and multilateral sender limits for other participants not being defined bilaterally.

Interactive information and control system (ICS)

Nowadays the flow of information is assuming central importance. For this reason RTGS^{plus} provides the ICS. By means of dynamic, rapid and comprehensive online provision of information the participants can monitor their liquidity position at all times and are able to plan it in a far-sighted manner. All essential RTGS^{plus} information can be called up in real-time, in a transaction-oriented and interactive way. The participants can call up their liquidity position in RTGS^{plus} and, if available, for their Bundesbank home account. They have targeted access both to detailed information on any RTGS^{plus} payment and to accumulated payment information, eg incoming and outgoing payment queues. The system also provides messages on current status and general information. Participants can control their payment processing according to their needs and circumstances at any given time. All essential action parameters can be changed interactively, as long as the payment is not final, like limits, the position of payments in the queues, the processing type (express or limit payments), the setting of execution times ("from" and "till" payments) or the revocation of payments. The ICS is also used for liquidity transfers from the RTGS^{plus} account to the home account and, if the participant has a home account at the Bundesbank, from the home account to the RTGS^{plus} account. Moreover, the ICS is equipped with a backup functionality. This permits participants to send important liquidity transfers to other RTGS^{plus} participants even if there are problems in the internal systems of the sender.

Euro Link System (ELS)

The ELS was the German RTGS system before RTGS^{plus} went live. Now it is the entry point for banks in RTGS^{plus} as indirect participants via the Bundesbank during a transitional period which will last no longer than three years in total. The ELS operates from the high-availability computer centre (HVRZ) in Düsseldorf. RTGS^{plus} payments, which are always rapid Prior1 payments executed immediately if sufficient cover is available, are processed via the Bundesbank converter to RTGS^{plus}. Additionally, if a payment in RTGS^{plus} is addressed to an ELS bank the Bundesbank forwards this payment to the receiving bank as an ELS Prior1 payment. Cross-border TARGET payments are always processed via RTGS^{plus}.

3.2.5 Operation of the transfer system

The communication infrastructure of RTGS^{plus} is geared to SWIFT services. The system accommodates the demand for secure, modern and international routes of access by exclusively following SWIFT standards. That allows for a rapid connection to RTGS^{plus} and the realisation of considerable synergy effects due to the fact that SWIFT interfaces are already employed in many banks. Foreign banks can thus easily participate in RTGS^{plus}.

Payments are processed using the FIN Y-copy service, developed by SWIFT especially for real-time gross settlement systems. RTGS^{plus} customers can use the innovative, particularly secure SWIFTNet Services, offering a high level of availability and ensuring a comprehensive supply of information and active control in real time. They can use a fully automated exchange of information between their back offices based on XML message types via SWIFTNet InterAct or have a dialogue-oriented access to all relevant RTGS^{plus} data via SWIFTNet InterAct Browse. Customers who do not wish to use SWIFTNet Services may communicate through a worldwide virtual private network (VPN).

RTGS^{plus} is friendly to straight through processing (STP) in many respects. It uses SWIFT data record formats and thus provides the basis for totally automated payment processing. RTGS^{plus} supports STP features like the SWIFT message type MT103+ and high standards regarding the quality of data. At the end of the day participants receive message types MT940/950, which enables them to automatically balance the payments cleared on that particular day against the payments entered in their internal processing systems.

RTGS^{plus} offers a high degree of availability and reliability by using the latest technology and a high degree of backup provision. RTGS^{plus} operates from the HVRZ in Frankfurt.

3.2.6 Credit and liquidity risk

RTGS^{plus} is the first system to overcome the barrier between gross and net settlement systems and integrates the advantages of both environments into a unique system. RTGS^{plus} accounts, which are run on a credit basis only, are the basis for any transaction processed in the system. All payments are characterised by secure processing in central bank money with early finality, which is typical of real-time gross systems. Payment instructions are handled immediately and checked for cover. If there is sufficient liquidity available, the payment is settled and central bank money transferred simultaneously and immediately. If not, the payment order will be placed in a queue. The credit booking to the RTGS^{plus} account of the recipient is final and irrevocable right away and the funds are available for disposal without any further restrictions. For this reason, RTGS^{plus} does not create any settlement, credit or liquidity risk. In contrast to other RTGS systems, the usage of offsetting payments as additional cover in RTGS^{plus} facilitates payment processing and reduces liquidity needs. Moreover, smooth and fair behaviour among the participants is supported by the liquidity management features provided in RTGS^{plus}.

3.2.7 Pricing

Only transaction fees fully recovering the costs are charged in RTGS^{plus}, ie there are no entry fees or periodical fixed fees. The price model takes the interest of both large and small banks into account. Participants with a low number of transactions profit from a favourable, transparent transaction price, being valid for all participants, whereas banks with larger volumes benefit from a scaled discount system:

Submission per month	Transaction fees
For the first 4,000 orders	EUR 0.24
For the following 16,000 orders	EUR 0.22
For the following 40,000 orders	EUR 0.205
For the following 40,000 orders	EUR 0.19
For orders beyond that	EUR 0.17

3.3 The retail payment system RPS

3.3.1 General overview

The electronic RPS is used both for the routing of credit transfers and for the collection of cheques and direct debits. Banks and other Deutsche Bundesbank account holders (eg public authorities) can participate in the RPS. As a matter of principle, orders must be presented by banks in paperless form. Cheques for amounts of EUR 3,000 or above (so-called "GSE" cheques) are an exception to this rule. In general, retail payments without a need for priority treatment are submitted to the RPS and are batch-processed "overnight". Incoming and outgoing payments can be handled both on electronic media (magnetic tapes or diskettes) and, since 17 March 2000, via data telecommunication. In 2002, the share of payments processed via telecommunication reached more than 50%. The processing time for RPS payments within the giro network of the Deutsche Bundesbank is one working day. Since 5 February 1999, the booking of entries of credit transfers to the accounts of the submitter and of the receiving credit institution has been effected on the business day after submission; the RPS is therefore float-free - as has already been the case in the Deutsche Bundesbank's collection procedures for some years. The RPS is based on a number of agreements between the central associations of the banking industry and the Deutsche Bundesbank. The content of these agreements relates both to technical requirements and to certain conversion requirements.

In addition to the General Terms and Conditions of Business of the Deutsche Bundesbank, both the "Special terms of the Deutsche Bundesbank for the Retail Payment System" (RPS conditions) and the "Special terms and conditions of the Deutsche Bundesbank governing electronic order placing, data transmission and account information" (EADK conditions) are applicable with regard to clearing in the RPS procedure; moreover, remote access is subject to the "External specifications for electronic access to the Deutsche Bundesbank".

3.3.2 Participants

Each credit institution with an account at a Deutsche Bundesbank branch which meets the technical requirements of the RPS is entitled to submit credit transfers or cheques and direct debits to the Bundesbank on electronic media or by data telecommunication (cf the special case of the GSE above). The branches and the Central Office of the Deutsche Bundesbank use this system to execute orders of their customers (eg public authorities) by paperless transfer.

3.3.3 Types of transaction

The RPS is utilised to process paperless credit transfers and direct debits of any value. By contrast, cheque truncation items (BSE cheques) can only be submitted if their face value is below EUR 3,000 and if they meet special formal requirements. In this case, they are collected on a paperless basis and without presentation of the original cheques to the drawee credit institution, as laid down in the Agreement on the collection of cheques within the German banking industry. In principle, these cheque data need to be recorded by the first collecting institution. However, the conversion can also be effected by a bank instructed or commissioned to do so by the first collecting institution. The first collecting institution is obliged to examine the cheques to establish their compliance with formal and legal requirements. Cheques that are formally incorrect must be collected within the GSE procedure. GSE cheques, ie cheques with a value of EUR 3,000 or more, and other collection papers not capable of being processed within the BSE procedure are transformed into data records, too, and are collected

via the RPS. In addition, all GSE vouchers are presented physically to the drawee credit institution. The conversion of cheques for the GSE procedure is performed exclusively at the Bundesbank's computer centres and payment transaction points.

3.3.4 Processing environment

The payments are channelled to the central multiple virtual storage (MVS) application (at an HVRZ) via decentralised input/output stations in the regional computer centres. The payments converted in the branches of the Bundesbank using the data input and output (DEA) systems are channelled directly to the central MVS application, where the incoming and outgoing payments by data telecommunication are processed and then executed directly via a central gateway.

The electronic data media (EDM) and GSE cheques must be submitted to the Deutsche Bundesbank branches by 2.30 pm or, in the case of direct submissions, to the relevant regional computer centre by 6.30 pm. Submissions by remote data telecommunication must be concluded either by 8 pm in the case of credit transfer files or 9 pm in the case of direct debits and/or BSE items. Banks have the possibility of joining a service centre or clearing institution and having their submissions and deliveries effected by this institution; in such cases the payments will be settled via the clearing institution. The EDM are read in at the computer centres and routed to the central MVS application. This is where the actual data processing, ie the sorting of payment orders, takes place. After processing, the computer centres receive pre-sorted files to be forwarded via EDM exchange to the recipient credit or clearing institution, or to the recipient branches of the Deutsche Bundesbank. Participants using remote data communication are supplied with the files directly by the MVS application using a central gateway interface.

Credit transfers are executed on a gross cumulative basis, with sufficient cover being a vital condition for execution. On the date of submission the level of cover required is ascertained by blocking an amount equivalent in value to the payment orders submitted in the submitter's current account. The following business day, the account of the submitting bank is debited and the blocked funds are released. The value of cheques and direct debits is credited on the business day following submission ("subject to collection") and is also settled on a gross cumulative basis. Crediting and debiting of accounts always takes place at the same time on the working day after submission.

3.3.5 Credit and liquidity risk

Since each (single or collective) payment is booked on a gross basis and revocation of the transaction with the Deutsche Bundesbank is no longer possible once automatic processing has been launched, there is no credit risk - and generally no liquidity risk - for the recipient bank. The latter can make the incoming funds available to the final beneficiary without reservation.

For cheques and direct debits, there is some credit and liquidity risk as the items are credited "subject to collection".

3.3.6 Pricing

The following prices are charged (as from 1 July 2002). Data records submitted on EDM or by data telecommunication are subject to a transaction fee of EUR 0.0015 per data record. No minimum fee is charged any more. Additionally, the EDM is subject to a fee of EUR 7.50 per item, the delivery of paper-based items (eg direct debits) EUR 0.25 per item. Paper-based credit transfer orders of non-banks and paper-based cheques submitted are billed EUR 0.30 per item; the sorting and delivery of GSE cheques for credit institutions is charged with an additional fee of EUR 0.30 per item.

3.3.7 Future trends

Plans are under way in close cooperation with the German banking industry to allow data records to be submitted until the morning of the next business day by the end of the first quarter of 2003 and to introduce further data telecommunication standards. In addition, discussions are in progress with a view to using the international SWIFT data exchange standards in RPS and to use the system as a German entry point to STEP2, a future clearing and settlement system for European retail payments of the Euro Banking Association (EBA).

3.4 Bilateral interbank clearing

For the interbank clearing of retail payments beyond the entity's own network, there is an additional procedure, known as bilateral interbank clearing ("garage clearing"). It consists of the bilateral exchange of files or data media between the main clearing institutions of the giro networks containing data for banks which can be reached via the respective receiver. Historically these bilateral exchanges of data (eg via tapes) were executed on the premises of the branches of the Deutsche Bundesbank and/or in a "garage/car park" of a commercial bank. Nowadays payment transaction data are increasingly exchanged via data telecommunication channels. The Bundesbank's RTGS system (= central bank money) is used only to effect gross settlement of the bilaterally exchanged data (transfer of the total of the data files or carriers exchanged bilaterally). The banks have only to pay a Bundesbank fee for the settlement rather than for huge numbers of individual retail payments. The decision to operate in this bilateral manner is based on purely commercial reasons.

3.5 Innovative payment procedures

3.5.1 E-banking and e-money

The German banking sector is currently undergoing a process of fundamental change, caused by, among other things, the possibilities offered by home banking. Here a distinction must be made between electronic banking in closed networks - as offered, for example, by the online service provider T-Online AG (a subsidiary of Deutsche Telekom AG) - and internet banking (open network). In addition to providing payment transaction services, home banking can also be used both for account management and securities transactions and for obtaining information. It was estimated that there were 19 million online accounts in Germany in 2001. It is further estimated that at the end of 2001 there were 29 million internet users, and it is reckoned that at the end of 2005 there will be 43 million. During the stock boom period (in the years 1998 to 2000) the number of customers conducting stock exchange business online doubled. The growth rates have decreased since the stock markets dropped off in 2000. Nevertheless, the increase in new online accounts is unbroken and is expected to continue as confidence in the usage of the technology increases as well.

Given the rapid increase in internet use, the share of electronic commerce⁵ (e-commerce) in the total volume of trade will grow even further. Secure and efficient payment systems are prerequisites for the projected growth of e-commerce, since e-commerce will only be of interest to companies and private individuals if fast, simple and, above all, secure payment systems are available.

It is becoming evident that in e-commerce between companies and private households, debit and credit cards are being used for the payment of larger amounts and e-money is being used for very small to small amounts. Here the borderline between e-money based on hardware and e-money based on software is becoming blurred, as card money can also be used for remote payments via the internet.

Major banks and other institutions working in cooperation with banks have developed e-money schemes besides GeldKarte, such as PayCard, CyberCash and eCash. So far none of them has been playing a pivotal role. Indeed, CyberCash and eCash have now discontinued their operations. The expectations of rapid growth in these markets have been shattered by the fact that suppliers of goods and services and consumers have so far not accepted those payment methods.

3.5.2 Other developments

With EDIFACT a uniform global format for the processing of electronic business and trade was created.

In 1997, in step 1, both the conditions for the exchange of EDI messages between the parties named in the contract and the requisite technical accessories were established with a view to handling business transactions between customers and banks via remote data transfer. In the second step,

⁵ Electronic commerce is the handling of business processes of all kinds via electronic networks.

mandatory EDIFACT acceptance was introduced on 7 February 1998, a uniform global format for the processing of electronic business and trade. Since then, all banks have had to be in a position to receive EDIFACT payments. In addition, there is no longer any need to convert EDIFACT messages into a national format. The Deutsche Bundesbank accepts EDIFACT payments in the ELS within the framework of electronic access to the Deutsche Bundesbank. Because of the very small number of payments in that format the Bundesbank deliberately does not accept such payments in RTGS^{plus}.

4. Securities settlement systems

4.1 Trading

4.1.1 *Legal foundations of stock exchange trading*

The legal principles governing stock exchange trading are not embodied in a single act dealing with all issues relating to the stock exchange system. The Stock Exchange Act (BörsG) and the German Securities Trading Act (WpHG), the scope of application of which extends to stock exchange trading, provide the public law framework. Moreover, stock exchange trading is based on a further system of legal provisions of varying legal quality. These are based to some extent on public law (eg the Stock Exchange Rules), and to some extent on private law (eg the terms and conditions of trading on German stock exchanges). The provisions vividly reflect the characteristic legal traits of the stock exchange structure: on the one hand, there are stock exchange organs and supervisory bodies with sovereign powers, and on the other hand there are trading activities based on private and public law between licensed stock exchange participants, which include the intermediary services performed by brokers.

4.1.2 *Financial intermediaries engaged in the various securities markets*

Permission to trade officially on the stock exchange is granted only to representatives of banks and to official exchange and independent brokers.

Third parties not licensed to trade on the stock exchange must utilise the services of banks, since only the latter are allowed to act as brokers for third parties, while intermediary services between banks are performed by official exchange and independent brokers.

4.1.3 *Trading segments*

The stock exchanges are divided into several segments which are in turn subdivided into various categories according to the rules and requirements governing the securities being traded. A distinction can be drawn between a regulated market set out in the European Investment Services Directive (ISD) and the regulated unofficial market. The official market, the regulated market and the Neuer Markt segment comply with the requirements for a regulated market in the ISD. The listing requirements and subsequent obligations in relation to securities vary according to the market segments concerned.

In Germany, shares are currently order-driven and floor-traded by brokers on eight stock exchanges. The stock exchanges are located in Berlin, Bremen, Düsseldorf, Frankfurt/Main, Hamburg, Hanover, Munich and Stuttgart. In addition, stock market participants use the electronic trading system XETRA operated by the Frankfurt Stock Exchange (FWB), which generates the highest turnover.

4.1.3.1 *Official market*

The German stock exchanges' official market segment is the segment with the strictest requirements for companies in search of capital and where the lion's share of transactions in shares and bonds is carried out. When a company is listed on the stock exchange, a detailed prospectus must be supplied giving precise information on the company. In addition, interim reports and an annual balance sheet must be published in a stock exchange gazette. Exchange prices for securities listed for the official market will continue to be fixed by officially appointed, sworn brokers until July 2005. With the new Stock Exchange Act from July 2002 the link between the listing of securities in a market segment and a single form of price determination by official and independent brokers was discontinued. After a

transitional period of three years (up to July 2005) it will be left to the stock exchanges to decide on the configuration of the trading systems they use (floor trading with brokers, computer-assisted or fully computerised trading).

Clients have the right to have their orders carried out at the fixed price. Orders on an unlimited basis are given preference when prices are fixed.

The regulated market

The regulated market provides companies with easier access to trading on the stock exchange than is the case with official trading. The market is characterised by simplified listing requirements and disclosure rules which are intended to offer medium-sized companies in particular an inexpensive way of having their shares traded on a market that is regulated by law and under the supervision of a stock exchange. Under the new Stock Exchange Act, stock exchanges now have the opportunity to introduce additional requirements for certain areas of the regulated market in special segments, or market segments in general, with the consent of the supervisory authorities.

The stock exchange introduction prospectus (company report) can be shorter. It must be published, but not necessarily in the stock exchange press. In addition, fixed interest securities are also traded on the regulated market. Prices are fixed by brokers commissioned and supervised by the stock exchange management in accordance with the same regulations that will apply in future to the official market.

The Neuer Markt

The Neuer Markt (New Market) created by Deutsche Börse AG in the first quarter of 1997 is designed to operate as an additional stock market segment to strengthen the share capital market for young high-tech companies. The Neuer Markt segment was introduced on the Frankfurt Stock Exchange and is operated by Deutsche Börse AG. Key features are the high degree of transparency offered by companies to investors in this market and the strict listing requirements. Research reports and information on its clients' companies help to bridge the information gap between the issuer and the investor.

The Neuer Markt does not constitute a separate segment on the stock exchange. In terms of stock exchange legislation it belongs to the regulated market segment.

Access to the Neuer Markt is such that permission for a listing must be obtained in the regulated market while the listing is entered in the Neuer Markt segment. Owing to its admission to a public law market segment, the Neuer Markt is subject both to public law monitoring by the Trading Supervision Authority (Handelsüberwachungsstelle) and the Stock Exchange Supervisory Authority (Börsenaufsichtsbehörde) as well as to the Securities Trading Act (WpHG). Trading is carried out continually via designated sponsors who secure the purchase and sale of securities by providing the bid and offer prices. The Neuer Markt also procures additional liquidity for an asset through its duty to provide purchase and sales prices on request.

4.1.3.2 The regulated unofficial market

The regulated unofficial market is an unofficial securities trading segment operating on the stock exchange floor during trading hours. It provides for trading in securities (shares, bonds, warrants) which have not been listed either in the official or regulated market. It also serves as a market segment for regional and foreign securities. Inclusion in unofficial trading on the stock exchange is approved after application from "a company authorised to trade on the exchange", usually a bank. The listing requirements are limited; there is no obligation to publish a prospectus, but a brief exposé must be prepared for every public offer for sale. Public offers generally require publication of a full prospectus that is approved by the Federal Financial Supervisory Authority (BaFin) in accordance with the Securities Prospectus Act. However, the mere inclusion of the securities of an issuer in the regulated unofficial market as such does not constitute a public offer under German law. The brokers are responsible for setting the prices for securities and for the listings.

4.1.4 XETRA

XETRA is Deutsche Börse AG's electronic trading system for spot trading and coexists with floor trading. XETRA is conceived as an order-driven trading system with automatic transaction matching

which consolidates all orders in a central order book that is open to inspection by all XETRA participants. Since October 1998 issuers have been able to assign credit institutions, brokers and securities trading houses as designated sponsors (formerly "Betreuer") to XETRA. There may be one or more designated sponsors for a given security. However, a designated sponsor may look after several securities even without an assignment from the issuer. Designated sponsors create a higher degree of liquidity in XETRA trading by giving binding prices on both the bid and ask sides (quote-driven trading system). Securities are transferred with the help of designated sponsors from daily auctions to continuous trading. With the exception of Dax stocks, the scope of securities for which designated sponsors can be appointed comprises all shares listed at the Frankfurt Stock Exchange.

4.1.5 Eurex

Eurex was conceived jointly by Deutsche Börse AG and the Swiss Stock Exchange in December 1996 and established in 1998 through a merger between Deutsche Terminbörse (DTB) and SOFFEX. It is thus the common futures and options market of the German and Swiss stock exchanges. Eurex is an independent, fully electronic market for forward exchange transactions, ie both futures contracts and listed options are traded.

Eurex offers a cross-border market featuring a uniform range of standardised products on the basis of a harmonised body of rules and regulations. A distinction is drawn between participants who transact own-account and customer business and those who also perform market-maker functions. The task of market-makers is to provide binding bid and offer prices for the base instruments which they manage.

The futures exchange operates in four phases of daily trading. In the pre-trading period, orders and quotes can be submitted and information retrieved. On the basis of the orders and quotes entered up to this point, a preliminary opening price is displayed in the opening period, which is subject to revision as further orders and quotes are received. A final opening price is determined within the scope of the subsequent compensation process. Trading continues throughout the trading period. Market participants can enter orders and quotes in the system for about two hours after the trading period ends, ie in the post-trading period.

Moreover, since 27 August 2000 Eurex has been cooperating with the Chicago Board of Trade (CBOT) in the area of electronic derivatives trading on a jointly developed platform based on Eurex technology. The joint venture company a/c/e (alliance/cbot/eurex), in which each partner holds an equal share, provides access to the products of both stock exchanges via one trading screen.

4.1.6 European Energy Exchange

The European Energy Exchange represents the first integrated spot and futures market for electricity in central Europe. The spot market was launched on 8 August 2000, and the futures market followed in the fourth quarter of 2000.

The European Energy Exchange unites the technology of the XETRA and Eurex stock exchange trading systems. Its aim is to enable European market participants to trade freely in energy.

4.1.7 Recent developments

Founded in October 2000, Eurex Bonds is a joint initiative of Eurex Frankfurt AG and leading financial institutions. Eurex Bonds is an electronic trading system for bond trading within the Deutsche Börse Group. Participants are able to combine bond trading on Eurex Bonds with basis trading (the arbitrage between futures contracts and bonds) and since July 2001 repurchase agreement trading (repo) electronically on Eurex. In addition, basis trading is offered for all bonds which are deliverable through Eurex's capital market futures. All fixed income debt instruments issued by the Federal Republic of Germany and by the Treuhandanstalt, jumbo Pfandbriefe and bonds issued by the European Investment Bank, Kreditanstalt für Wiederaufbau and the German federal states are available for trading. Twelve market-makers provide for liquidity in these products, too, and transactions are cleared via Eurex Clearing AG and settled via Clearstream Banking AG Frankfurt (CBF), Clearstream Banking S.A. Luxembourg, and Euroclear Bank Brussels.

The idea is to achieve, by limiting the circle of participants, more flexibility than the traditional stock exchange structure has been able to provide, which is why the group is to be confined to 14 banks with market-maker functions. Trading is based on a model in which quotes and orders are entered into

a central quote book. During trading hours, orders entered into the system are executed against the best available bid or asked prices. Trading on Eurex Bonds can be done via the Eurex Bonds trading system or via the internet. There are currently 23 European banks connected to Eurex Bonds. Participation in the system is available to all banks and financial services firms which fulfil the trading and clearing admission requirements.

The Bundesbank, with its special status that does not include market-maker functions and a capital holding, has been trading on Eurex Bonds for the account of the Federal Government since October 2000. The operators of Eurex Bonds introduced in 2001 a repo trading facility via the internet-based platform "Eurex Repo". Now the participants are able to conduct cash trading, basis trading and repo trading on one platform. The German Finance Agency joined Eurex Bonds at the beginning of 2002. The Agency has been the central service provider for the Government of the Federal Republic of Germany since 2001 in all matters relating to debt management. Eurex Bonds has enlarged the list of instruments to include "Jumbo Pfandbriefe" (asset-backed securities), agency bonds (such as "Kreditanstalt für Wiederaufbau") and regional government (Länder) bonds.

4.1.8 Supervision of trading in securities and derivatives and exchange supervision

Trading of securities and derivatives in Germany is supervised on three levels:

- the BaFin;
- supervisory authorities of the Länder;
- trading supervision authorities of the stock exchanges.

Moreover, anyone wishing to provide commercial securities services needs a banking licence from the BaFin.

The supervision of securities and derivatives trading by the BaFin serves the objectives of market transparency, market fairness and investor protection. The tasks of the BaFin are as follows:

- surveillance to prevent and detect illegal insider and price and market manipulation activities;
- monitoring ad hoc disclosure requirements of listed companies and disclosure requirements regarding directors' dealings;
- monitoring the disclosure requirements in the event of a change in the voting rights held in companies whose shares are admitted to trading on an organised market within the European Union or the European Economic Area;
- monitoring compliance with German rules of conduct relating to customer transactions;
- depository for prospectuses;
- international cooperation with regulatory and supervisory authorities responsible for securities exchanges, securities and derivatives trading in matters relating to the supervision of securities trading;
- authorisation of foreign organised markets in Germany; and
- monitoring takeovers in Germany.

As a rule, the stock market supervisory authorities of the Länder are responsible for legal and market supervision, ie:

- supervision of compliance with stock exchange regulations;
- regulation of stock exchange trading and the processing of stock market transactions;
- tasks relating to approval;
- the issuing of necessary orders for the exchange and the trading participants which are designed to prevent violations of exchange law provisions and orders, or to eliminate or prevent irregularities which could impair the orderly conduct of exchange trading, the settlement of exchange transactions and the supervision thereof; and
- authorisation of Alternative Trading Systems (ATs) domiciled in Germany.

The Trading Supervision Authority (HÜST) is an independent organ of the stock exchange and exercises direct market supervision. It systematically and meticulously records all data relating to trading and processing on the stock exchange and checks them for conspicuous features and irregularities. In this manner, it controls pricing and price fixing. In addition, it performs transaction checks among official exchange brokers and independent brokers and investigates suspect cases.

4.2 Clearing

The clearing house for the Eurex exchanges is Eurex Clearing AG. Eurex Clearing AG serves as the central counterparty for derivatives traded on Eurex. As a central counterparty, the clearing house interposes itself as buyer to every seller and as seller to every buyer (netting by novation). Counterparty risk is reduced since each clearing member will have the clearing house as its counterparty in place of other market participants, which in most cases will not have the same credit quality as Eurex Clearing AG. By consolidating exposures under Eurex Clearing AG as the central counterparty, members receive the maximum benefits arising from the correlation between risk positions and portfolio diversification. A risk-based margining system based on value-at-risk methodologies allows for the maximum benefit to members, while maintaining the clearing house's financial soundness at the levels targeted by the risk-carrying community.

In addition, Eurex introduced a remote clearing system on 1 August 2000. This enables participants from each country in the European Union or Switzerland not only to participate directly in trading, but also to handle the clearing and settlement themselves.

Eurex Clearing AG also has plans to expand its central counterparty clearing services to securities. As a first step, it has taken over this role in the Eurex bond and repo trading system. A further step will be the introduction of a central counterparty for equities announced for the first quarter of 2003.

4.3 Settlement

4.3.1 *Legal foundations for custody operations by banks*

The Safe Custody Act of 1937 constitutes the legal basis for the safe custody and administration of securities by banks. This Act serves to protect the owners of securities who deposit them with banks. In particular, it ensures that purchasers acquire proprietary rights to their securities as soon as possible and that they do not lose these proprietary rights if the depository bank should encounter financial difficulties.

Banks may, in their own names, give custody of their customers' securities to some other (third-party) custodian. This is not a violation of the rights of the depositor since the third-party custodian must assume, in principle, that the securities delivered are the property of the customers of the submitting bank (principle of non-property presumption). In particular, without special permission, no securities belonging to customers may be used to cover the liabilities of the banks involved. Institutions involved in custodian operations are by definition banks pursuant to the KWG and are thus within the ambit of banking supervision. In particular, this sector of business is subject to a special audit each year.

The Safe Custody Act (a special item of legislation for the banking sector) deals with the custody of securities by banks, as a rule in the form of collective safe custody or - at the request of the owner or if only individual certificates are issued - in the form of individual safe custody. Owing to rationalisation and cost factors and the general benefits of the book-entry system, only collective safe custody of immobilised or dematerialised securities is of significance today. Dematerialisation of securities is by law restricted to government issues. Legally dematerialised securities are treated in the same way as securities in collective safe custody.

In line with the possibilities laid down by the Safe Custody Act for custody of securities, the securities acquired by an investor are as a rule kept and administered, via a bank (intermediate custodian), at Clearstream Banking AG Frankfurt⁶ (third-party custody). For dematerialised securities, Clearstream is

⁶ Referred to as Clearstream unless otherwise specified.

entered as fiduciary in the collective debt register administered by the Federal (or Länder) Debt Administration, or else registration is effected in the individual debt register also administered by the Federal (or Länder) Debt Administration.

4.3.2 Germany's central securities depository

4.3.2.1 Legal and organisational framework

Clearstream Banking AG Frankfurt is Germany's *Wertpapiersammelbank*, or central securities depository (known informally as the CSD). It received permission from the BaFin to operate a bank in 1949. This banking licence was a restricted one, in line with Clearstream's past functions as a specialised institution, which has been extended recently. Until end-1999, Clearstream Banking AG Frankfurt - under its former name, Deutsche Börse Clearing AG, Frankfurt - was a wholly owned subsidiary of Deutsche Börse AG. On 1 January 2000, in the course of a capital increase, Deutsche Börse AG transferred its shares in Deutsche Börse Clearing AG to Clearstream International SA, Luxembourg. In return, Deutsche Börse AG received half of the shares in this newly established holding company. With regard to the ownership structure of Clearstream Banking International SA, Deutsche Börse successfully took over the remaining 50% stake held by Cedel International SA. Thus, Deutsche Börse has control of both a national (Clearstream Banking AG Frankfurt) and an international CSD (Clearstream Banking S.A. Luxembourg).

Customers of Clearstream can be domestic or foreign credit and financial service institutions or specialised public institutions. In addition, foreign CSDs and clearing organisations or supranational financial organisations can open securities and cash accounts with Clearstream. A requirement for admission as a customer of Clearstream is, among other things, that the respective institution be subject both to the provisions governing statutory auditing of securities deposits under the KWG and the laws of the country of origin in question, or voluntarily allow its safe custody accounts to be audited. Almost all banks engaged in securities trading or in custody operations maintain accounts with Clearstream. Institutions without a direct link to Clearstream can make use of the services offered by Clearstream indirectly via Clearstream customers.

Unlike many other national CSDs, Clearstream - one of the founding members of the European Central Securities Depositories Association - has a long history of establishing links with other countries with regard to the custody of foreign securities, even prior to the launch of European economic and monetary union.

Ownership of securities is transferred by book entry in the case of instruments in collective safe custody, or by physical delivery of the certificates in question. In the case of collective safe custody, the standard form of custody in Germany, the investor receives co-ownership - on the basis of the nominal amount or the number of securities it holds - measured in fractions of the collective inventory of a class of securities. Ownership passes once the booking entry has been completed (in the case of FOP - free of payment - settlement) or the bookings of securities as well as the appropriate cash positions have been processed (in the case of DVP - delivery versus payment). The settlement system of Clearstream is a "designated securities settlement system" governed by the Settlement Finality Directive.

Owing to the vast number of instruments it holds in custody and the number of transactions concluded each day, Clearstream has been providing cost-effective services for years. The transparent price structure is based on the principle that costs are borne by the party which creates them, giving incentives to customers to utilise the automated services available.

4.3.2.2 The settlement procedures of Clearstream Banking AG Frankfurt

Settlement of exchange-traded and OTC trades

All business transacted on stock exchanges, whether on the floor or via the electronic trading system of Deutsche Börse AG, XETRA, is automatically forwarded for processing to Clearstream Banking AG Frankfurt via appropriate IT facilities. On each banking day, the IT system generates a delivery list containing the specific data on the stock market transactions in question for checking purposes. Discrepancies have to be reported before the beginning of the next trading session. If no discrepancy is reported within a certain time, the underlying transaction will be deemed to have been accepted on a conclusive basis. Accordingly, confirmations among the business partners are not provided for. According to the stock exchange rules and regulations, all transactions have to be settled on the

second stock exchange day following the day of trading (T+2). Settlement lists are generated by the system as on the day of settlement, reflecting all securities account movements for the day in question along with the respective countervalues.

OTC transactions can be settled free of payment. Transactions against payment are only effected following a prior matching based on certain matching criteria. These transactions are entered by the parties concerned, and the system performs the settlement of the transactions. The settlement day can vary between T+0 and T+40. If the settlement day is T+0, same day processing and real-time settlement are possible (see below).

Basic settlement model

At Clearstream, securities transfers against payment are generally effected only on the basis of DVP, ie simultaneous delivery of securities and payment of the relevant cash equivalent. A precondition for DVP settlement, therefore, is that Clearstream customers have both adequate securities cover in their custody accounts and cash cover in their Deutsche Bundesbank accounts.

In technical terms, using the batch mode described below, the securities transfers are arranged in advance (provisional bookings) but only become final, from a legal point of view, once the Clearstream cash settlement procedure has been successfully concluded. Payments are processed in euros via accounts with the Deutsche Bundesbank. The cash clearing for standard settlement (STD) and the first same day settlement on the settlement day (SDS 1) take place between approximately 10.30 am and 11.30 am. The corresponding time of the cash clearing for the second same day settlement (SDS 2) is roughly between 1.30 pm and 2 pm.

In real-time settlement (RTS), simultaneous processing is also used in order to ensure that the final booking entries relating to the securities and payments are effected at the same time. RTS with DVP functionality takes place continuously between 7 am and 4.30 pm. The operating times of free of payment RTS deliveries, from 6 am to 6 pm, are even longer.

By adhering to the DVP principle, the settlement or principal risk is avoided, ie neither of the two trading partners needs to unilaterally render payment or delivery in advance. If customers do not have an adequate number of securities in their custody accounts, they can use Clearstream's automatic securities lending facility. Cash requirements can be covered through the usual central bank lending facilities, since the amounts are settled via central bank accounts.

Technical handling of processes (three batch processes, one real-time process)

The settlement of securities transactions within the scope of standard and same day settlement cycles (STD and SDS) is performed on a gross basis (provisional bookings only). Cash settlement is performed on a net basis. Instructions for the transfer of securities are processed in three batch-mode cycles. The batches are intended to maximise by iteration the number of settlement orders effected on the basis of the securities available in the participants' accounts. Account is taken of the priorities stipulated by customers when placing their orders with regard to the date of settlement (older, outstanding orders being processed first) and the scope of trading (large transfers are dealt with before processing smaller ones). At the end of a batch, each participant will have a single net cash position, since all incoming and outgoing payments are netted against one another.

The first batch, STD, takes place in the evening preceding the settlement day (S-1). The second (SDS 1) is effected in the morning of the settlement day (S). For standard settlement (STD), which as a rule takes place as of 7 pm, orders must be entered on S-1 by 7 pm at the latest. For the same day settlement cycle, SDS 1, the cutoff time for booking entries is 10 am on S. At the end of each batch run, ie at about 9 pm and 10.30 am respectively, Clearstream makes both a list of processed transactions (settlement list) and the net cash position (debit or credit balance) arising in the process available to the participants. If no securities are available on the participants' accounts, the instructions for delivery will not be carried out. Orders not executed are automatically transferred to the next processing period (ie scheduled either for the next standard or same day processing run).

Participants who have a negative net cash position at the end of SDS 1 (which includes the cash results of the standard settlement cycle) must arrange for the necessary cover to be made available in their Bundesbank accounts in due time. This cover can consist of a credit balance or available overdraft facilities. At 11 am, the Deutsche Bundesbank - via its various branches - debits the accounts of all banks with a net debit position, on instruction by Clearstream. Once all debit balances are covered, Clearstream disburses the amount in question to those participants who have a positive

net position. As a result of this disbursement, the preliminary securities transfers executed in the batches also acquire final status. If a participant with a debit position is unable to provide the necessary cover, the worst case scenario is that the settlement for that particular batch cycle will need to be unwound. However, this has never been necessary in the past, since Clearstream has additional means in place to contain this risk.

From about 10.45 am to 2 pm SDS 2 takes place, operating along the same principles.

Apart from standard and same day settlement, Clearstream provides a real-time DVP settlement service. Securities transfer orders can be forwarded to Clearstream on-screen between 6 am and 4.30 pm by both parties involved. The Clearstream system matches the orders, blocks the securities to be sold in its own system and electronically instructs the Deutsche Bundesbank to debit the cash account of the buyer. Once the debit entry has been made, ownership of the blocked instruments passes to the buyer, and the seller receives the cash amount in question.

4.3.2.3 Outlook

As part of its corporate integration plans, Clearstream Banking AG Frankfurt has transferred its global business (international bonds and equities) to the Creation settlement platform of its ICSD sister company Clearstream Banking S.A. Luxembourg (see also the Eurosystem chapter). The next step in this framework will be carried out by transferring the domestic securities business into a new settlement model designed in cooperation with Clearstream's participants. The main goals to be achieved by introduction of the new settlement model are pooling of liquidity, efficient cash clearing with maximum flexibility as well as elimination of the unwinding risk. The new settlement model, comprising both night-time and daytime processing, will provide the following specific features:

- technical netting, continuous finality and multiple batches;
- provisioning of liquidity prior to each batch in which securities transactions are to be settled - "pre-funding" will be performed solely through central bank money;
- achievement of DVP settlement by simultaneous settlement of cash and securities;
- transfer of cash credit balances without delay upon receipt of a request for payout by the customer;
- combination of mandatory and optional batches during daytime processing.

4.4 The use of the securities infrastructure by the Deutsche Bundesbank

Like any commercial bank, the Deutsche Bundesbank uses Clearstream for its customer business, ie for securities trading activities for the public sector, foreign central banks and international organisations as well as for associated services in the area of custody accounts.

In addition, Clearstream plays an important role in implementing the monetary policy of the ECB and granting intraday credit for payment system purposes. These credit operations are to be collateralised in accordance with Article 18 of the Statute of the ESCB. To this end, the Deutsche Bundesbank's counterparties hold a pledge pool with the Bundesbank, which consists of four parts:

- (1) securities in custody accounts kept with the Deutsche Bundesbank and pledged to the latter (these are known as "operational safe custody accounts" (Dispositionsdepots));
- (2) securities in custody accounts held with Clearstream and pledged to the Deutsche Bundesbank (pledge accounts in the collateral management system Xemac® of Clearstream Banking AG Frankfurt);
- (3) securities delivered via correspondent bank accounts with other central banks and pledged to the Deutsche Bundesbank (correspondent central banking model; see also Section 4.3.1 of the euro area chapter); and
- (4) non-marketable debt instruments (Tier 2 assets; eg pledged bank loans) which are directly held by the Deutsche Bundesbank.

In the case of Deutsche Bundesbank operational safe custody accounts, Clearstream assumes the role of delivering agent, and securities are delivered "free of payment" from a custody account of a Bundesbank counterparty with Clearstream to the Bundesbank's custody account with Clearstream for

crediting to the respective counterparty's custody account with the Bundesbank. The Deutsche Bundesbank assumes the daily valuation of collateral inventories according to the uniform Eurosystem criteria on its own responsibility. Clearstream has no further tasks; the Deutsche Bundesbank is largely independent of Clearstream in the day-to-day operation of the operational safe custody accounts and does not require an online interface for each single monetary policy operation or each single intraday credit for payment transactions in the course of a business day.

However, Clearstream does assume additional functions within the scope of its Xemac© pledge account system. In Xemac©, lump sums determined on a long-term basis are, as a rule, pledged. These are reported to the Bundesbank as an overall total. In addition, any changes to these lump sum amounts are reported to the Deutsche Bundesbank. By means of the direct links between Clearstream and other CSDs, non-German government bonds can also be pledged via Xemac© in favour of the Deutsche Bundesbank. Clearstream assumes the daily valuation of the securities in accordance with the Eurosystem criteria and automatically arranges for subsequent deliveries of securities which may be necessary in the event that the lump sum amount should be undermined due to price fluctuations.

