

**Payment, clearing and
settlement systems in
Germany**

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List of abbreviations

ACH	automated clearing house
ATM	automated teller machine
ATS	Alternative Trading Systems
BaFin	German Federal Financial Supervisory Authority – Bundesanstalt für Finanzdienstleistungsaufsicht
BBankG	Bundesbank Act – Bundesbankgesetz
BCM	business continuity management
BGB	German Civil Code – Bürgerliches Gesetzbuch
BIC	Business Identifier Code
BLZ	bank sort code – Bankleitzahl
BörsG	Stock Exchange Act – Börsengesetz
BSE	paperless cheque collection procedure – Belegloses Scheckeinzugsverfahren
CAM	Customer Access Mechanism – Hausbankverfahren
CBOT	Chicago Board of Trade
CCorp	Clearing Corporation
CCP	central counterparty
CPSS	Committee on Payment and Settlement Systems
CSD	central securities depository
DGS	German ATM System (Deutsches Geldautomaten-System)
DK	Die Deutsche Kreditwirtschaft (formerly Zentraler Kreditausschuss, ZKA)
DTB	Deutsche Terminbörse
DVP	delivery versus payment
EACHA	European Automated Clearing House Association
EADK	electronic order placing, data transmission and account information – Elektronische Auftragserteilung, Datenauslieferung und Kontoinformation
EBA	Euro Banking Association
EBICS	Electronic Banking Internet Communication Standard
ECB	European Central Bank
ECC	European Commodity Clearing AG
ECN	electronic communication networks
EEA	European Economic Area
EEX	European Energy Exchange
EGBGB	Introductory Act of the German Civil Code – Einführungsgesetz zum Bürgerlichen Gesetzbuch

ELV	electronic direct debit system – Elektronisches Lastschriftverfahren
EPC	European Payments Council
ESCB	European System of Central Banks
FOP	free of payment
FWB®	Frankfurt Stock Exchange – Frankfurter Wertpapierbörse
GSE	large-value cheque collection procedure – Großbetrag-Scheckeinzugsverfahren
GRM	Group Risk Management
HÜSt	Market Surveillance Office – Handelsüberwachungsstelle
ISE	image-based cheque collection procedure – Imagegestützter Scheckeinzug
KWG	Banking Act – Kreditwesengesetz (Gesetz über das Kreditwesen)
PE-ACH	Pan-European ACH
PIN	personal identification number
POS	point of sale
PSD	Payment Services Directive – Directive 2007/64/EC on payment services in the internal market
RPS	Retail Payment System (Deutsche Bundesbank)
RTGS	real-time gross settlement
RTS	real-time settlement
RVP	receipt versus payment
SEPA	Single Euro Payments Area
SFD	Settlement Finality Directive – Directive 98/26/EC on settlement finality in payment and securities settlement systems
SSP	Single Shared Platform of TARGET2
SSS	securities settlement system
TARGET2	Trans-European Automated Real-time Gross settlement Express Transfer system, second generation
T2S	TARGET2-Securities
WpHG	German Securities Trading Act – Wertpapierhandelsgesetz
Xetra®	Exchange Electronic Trading (electronic spot trading system of Deutsche Börse AG)
ZAG	Payment Services Supervision Act – Zahlungsdiensteaufsichtsgesetz

Introduction – main recent developments

Payment and securities settlement systems in Germany include various institutional and infrastructure arrangements and processes for initiating and executing payment and securities transactions. Detailed information is provided in the sections below on institutional aspects, payment media used by non-banks, payment systems and systems for post-trade processing, clearing and securities settlement. The development of these systems is an ongoing process aimed at improving their safety and efficiency.

Large-value payment systems

When the euro was introduced in 1999, the Eurosystem implemented the Trans-European Automated Real-time Gross settlement Express Transfer (TARGET) system for the settlement of individual payments in euros (as a rule, large-value or urgent payments). Primarily, TARGET was developed to serve the needs of the Eurosystem's monetary policy and to ensure a smooth and efficient settlement of euro payments, particularly as regards – but not restricted to – inter-member state payments within the euro area. In November 2007 TARGET was replaced by its successor system, TARGET2, which provides further functional and technical enhancements, based on a single technical platform (Single Shared Platform, SSP) and legally structured as a multiplicity of RTGS systems. The name of the Deutsche Bundesbank's RTGS system is TARGET2-Bundesbank. As part of the further concentration of processing of individual euro payments on the SSP, banks established in the European Economic Area (EEA) ceased to be able to participate indirectly via the Bundesbank or be registered as an addressable BIC holder by the Bundesbank in January 2011. As a consequence, these banks now either participate directly in TARGET2 or are registered by a commercial bank which participates directly. In November 2011, the Bundesbank connected its retail payment system to TARGET2 and thereby moved the related cash settlement from the Bundesbank home accounts to the accounts on the SSP.

Retail payment systems

There is no privately owned or operated automated clearing house (ACH) in Germany. Thus, the Bundesbank fulfils its statutory task by operating its own Retail Payment System (RPS). This provides nationwide coverage for non-urgent legacy customer payments – that is, credit transfers, direct debits and electronic collections of cheques denominated in euros. Financial institutions may participate directly or indirectly via a direct participant in the RPS on an open and non-discriminatory basis. Other Bundesbank account holders (mainly non-financial institutions, eg public authorities) benefit from the service offering of the RPS through the Bundesbank as their customers. In January 2008, the service offering of the Bundesbank was extended to encompass the processing of Single Euro Payments Area (SEPA) Credit Transfers. Since November 2009, financial institutions can also submit SEPA Direct Debits to the RPS for clearing and settlement. The RPS has been connected to other SEPA-compliant ACHs on a bilateral basis to optimise reachability for SEPA payments.

Securities trading, clearing and settlement

The last few years have been marked by – amongst other things – the work in connection with TARGET2-Securities (T2S). With T2S, the Eurosystem aims to offer a new, harmonised and central settlement of securities in central bank money with the objective of overcoming the current fragmentation of the European settlement market, improving cross-border settlements and strengthening competition in the post-trading sector. Participation in T2S is voluntary for all central securities depositories (CSDs). T2S does not aim to serve as a new pan-European CSD, but merely offers settlement services. The concept of T2S is based on the integrated model, which is an amalgamation of central bank money and securities

settlement into one platform with a delivery versus payment (DVP) mechanism. Aside from the euro, it will be possible to carry out settlements in other currencies too – provided the central bank in question gives its consent. Four central banks have been entrusted with the development and the future operation of the platform: Deutsche Bundesbank, Bank of France, Bank of Italy and Bank of Spain.

1. Institutional aspects

1.1 The general institutional framework

1.1.1 Legal requirements

In Germany, the transposition of the Payment Services Directive 2007/64/EC (PSD) into national law by 1 November 2009 has led to a significant expansion of existing provisions regarding payments. The regulatory aspects of the Directive are implemented in the Payment Services Supervision Act (Zahlungsdiensteaufsichtsgesetz or ZAG), while the civil law provisions have been incorporated into the German Civil Code (Bürgerliches Gesetzbuch or BGB) and its Introductory Act (Einführungsgesetz zum Bürgerlichen Gesetzbuch or EGBGB).

Until 1 November 2009 payment services could only be provided in the German market by credit institutions that were permitted to conduct their business pursuant to the German Banking Act (Gesetz über das Kreditwesen or KWG). Furthermore, payment orders (money transmission services) were executed by financial services institutions according to the KWG. To promote competition, a new group of payment service providers was defined in the PSD known as payment institutions. They are allowed to offer payment services without being a credit or a financial services institution, and do not have to cover the entire range of requirements to be fulfilled by a credit institution. In contrast, the collection of cheques and bills of exchange is still defined as banking business in the Banking Act and therefore still permitted only to banks.

The provision of payment services requires a licence as a credit institution or a payment institution from the German Federal Financial Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht – BaFin), except where permission to conduct payment transactions is based on special laws, as the case is for the Bundesbank.

The responsibilities and powers of the Bundesbank are laid down in the Bundesbank Act (Bundesbankgesetz or BBankG of 1957) with its latest amendment that entered into force on 30 April 2002. In accordance with Section 3 of the BBankG, the Bundesbank shall arrange for the execution of domestic and international payments and contribute to the stability of payment and clearing systems. In addition, the tasks of the European System of Central Banks (ESCB) with regard to payment systems are mentioned in Article 105(2) of the Treaty establishing the European Community, as well as in Articles 3 and 22 of the Statute of the ESCB and of the European Central Bank (ECB).

In accordance with 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 and substantiated to the Federal Cartel Office through BaFin. Both of these offices are responsible for ensuring that undesirable 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. Where no report is provided, the relevant agreements or resolutions are deemed invalid.

1.1.2 Rules governing payment services

The rules governing payment services in Germany are mainly influenced by and based on the following framework:

- European legislation and international standards;
- national legislation, in particular the general rules of the Civil Code;
- the statutory provisions for the Bundesbank as an integral part of the ESCB;
- contractual agreements signed by the federal associations of the German banking industry and the Bundesbank; and
- the respective current versions of the European Payments Council documentation (Rulebooks and Implementation Guidelines).

In addition to the general rules of the Civil Code, the Insolvency Code and the ZAG establish the main statutory framework for domestic and cross-border payment services.

With the PSD transposition the rules pertaining to the execution of transactions have been clearly defined. For example, the maximum execution time (between receipt by the instructed payment service provider and crediting of the payee's account) for non-paper-based payments was reduced from up to three business days to one business day. For a transitional period until 1 January 2012, payment service providers could still agree with their customers on a period of no longer than three business days. With regard to the calculation of charges, payment amounts must, without exception, be passed on without deduction.

The legal provisions for value dating and availability of funds have led to a further tightening of the regulations for the processing of transactions. Accordingly, credit transfers have to be placed at the payee's disposal immediately. While the value date for credit transfers is the day on which the amount is credited to the payee's payment service provider, the debit value date may not be earlier than the date on which the payer's account is debited.

In the event of customer complaints in Germany, reference is made to the ZAG by independent bodies at the banking association level and the Bundesbank level.

Special legal requirements for cheque-based transactions are established by law, too. The provisions of the Cheques Act of 1933 (which fully transpose the Geneva Cheque Convention) must be observed for the collection of cheques. In 2007 the regulation on the cheque clearing system was amended to allow for the processing of computer-scanned cheque images.

The (technical, organisational and even some legal) details of payment transactions between credit institutions are laid down in contractual agreements signed by the federal associations of the banking industries and the Bundesbank, making such agreements binding for all credit institutions, payment institutions that are party to the agreements, and the Bundesbank.

In addition, and complementary to the aforementioned statutory rules and agreements, the legal relationship between payment service providers and their customers is based on the general (and some more specific) terms and conditions of the payment service providers. Similarly, the legal relationship between credit institutions and the Bundesbank is governed by the latter's General Terms and Conditions.

1.2 The role of the Deutsche Bundesbank

The Bundesbank's activities in the field of payments can basically be divided into three pillars: payment systems policy, oversight, and operation of its own systems. In accordance with its statutory mandate, the Bundesbank's activities in this field are not of a commercial nature and, in particular, do not pursue the intention of making profit. Rather, the main reason for its involvement in payment issues is that cashless payments are of great

importance in modern economies. Although neither the BBankG nor the Statute of the ESCB expressly mentions responsibility for securities clearing or settlement, the Bundesbank has a vital interest in these issues, given that securities markets play a central role in the economy. Moreover, the central bank's monetary policy depends, to a great extent, on efficient securities markets, as central bank credit is granted only against reliable collateral. There is a consensus at both European and international level that securities clearing and settlement are likewise matters of key concern for central banks.

1.2.1 Cooperative nature of payment systems policy

The Bundesbank is actively involved in shaping developments in cashless payments. By means of a cooperative approach, it attempts to coordinate the interests and decisions of the parties involved in cashless payments and – if necessary – to facilitate decision-making, as well as fostering developments with regard to increased efficiency and security of payments. This function is often likened to the role of a catalyst.

The Bundesbank's payment policy does not only focus on the developments at national level. Against the background of European integration and globalisation in the financial industry, activities have increasingly shifted to the European and international levels.

In the domestic and the European context, one of the Bundesbank's tasks is to work towards the realisation of the SEPA, shortening processing times, reducing settlement costs and increasing security. Given the large number of credit institutions in Germany, it is particularly important that agreements on procedures and standards in the field of payments be binding for all parties concerned. Germany consciously took a decision to avoid going down the route of sovereign regulation by parliament or the central bank. Instead, the agreements take the form of multilateral agreements concluded by common accord by all the central associations of the banking industry. In this respect, Die Deutsche Kreditwirtschaft (DK), which was established in 1953 and consists of representatives of the central associations of the German banking industry, plays a prominent role. The Bundesbank is also involved in the DK's payment activities. For example, the Working Party on Automation, which was established in 1959 and discusses general aspects of payment automation, is chaired by the Bundesbank. Consequently, the Bundesbank has been involved in the creation of most of these agreements and is, in many cases, also a contractual party, which means that it must enforce and comply with the provisions in its own operations.

At European level, the Bundesbank is involved in the ongoing development of the European payment and securities settlement environment, particularly as part of the ESCB. In addition, the Bundesbank actively follows the relevant legislative initiatives of the European Commission, including, for example, the current creation of the Regulation establishing technical requirements for credit transfers and direct debits in euros. With regard to the creation of SEPA, the Bundesbank also participates in the national SEPA working groups set up by the German banking industry, which enables it to actively influence the debate in the European Payments Council (EPC). Furthermore, the Bundesbank helps to push forward the national implementation and migration of the SEPA.

At national level, the Bundesbank has also been actively involved in the dynamic development process in the field of securities settlement. The key concern alongside efficiency is to continuously enhance the security of clearing and settlement procedures. In particular, the Bundesbank has promoted settlement systems in which the clearing of the securities leg is dependent upon the successful booking of the cash leg. This also responds to the need for DVP in securities transactions. Thus, together with Clearstream, the German CSD, the Bundesbank developed a concept where cash is blocked at the TARGET2 account of participants with their national central bank (including Bundesbank) and in a legally safe way dedicated for the processing of securities, achieving finality of processed securities transactions intraday and intranight.

1.2.2 Oversight function regarding payment and securities settlement systems

Oversight is generally – and thus also by the Bundesbank – understood as an activity in the public interest, aimed primarily at promoting the safety and efficiency of payment and securities settlement systems and, in particular, at reducing systemic risk. The Bundesbank's oversight activities are based on the provisions of the BBankG and the Statute of the ESCB and the ECB as part of the Treaty establishing the European Community, as well as internationally recognised standards and Eurosystem standards. Traditionally, the Bundesbank takes a market-oriented approach. So far there has been no need for regulatory intervention. For reasons of transparency and to avoid any conflict of interest, the areas of oversight and operation are kept separate within the Bundesbank.

As a member of the Committee on Payment and Settlement Systems (CPSS) and an integral part of the ESCB, the Bundesbank is actively involved in developing oversight standards and principles on both a global and a European level.

Furthermore, the Bundesbank oversees and monitors the security and efficiency of payment systems, securities clearing and settlement systems (including central counterparties (CCPs)) as well as payment instruments. For this purpose, the systems' compliance with the relevant standards and principles as well as the smooth functioning of payment instruments based on special oversight frameworks is monitored.

The Bundesbank's specific oversight activities in the context of payment systems include, for example, the oversight of the German TARGET2 component as well as participation in cooperative oversight activities of TARGET2 and the EURO1 system of the Euro Banking Association (EBA). In addition, an analysis of the German correspondent banking business is carried out in the framework of a European survey every two years. With regard to payment instruments, the Bundesbank oversees the German card payment scheme *girocard* and participates in the cooperative oversight of international card schemes. It will also take part in the oversight of the SEPA instruments (SEPA Credit Transfer and SEPA Direct Debit), which is expected to start during 2012.

The Bundesbank is also involved in the cooperative oversight of payment systems and infrastructures that are of major importance for the security and efficiency of payment operations in Germany because of the nature of their services, such as SWIFT, CLS and Warehouse Trust LLC.

For securities clearing and settlement systems, specific oversight activities include Eurex Clearing AG (CCP) and Clearstream Banking AG (CSD). Both entities are licensed as credit institutions, subject to the German Banking Act and therefore also supervised by the German regulator BaFin. The general conditions for this domestic cooperation are laid down in a guideline for the cooperation between BaFin and the Bundesbank. The internal cooperation of BaFin and the Bundesbank is based on memoranda of understanding with other relevant regulators and central banks. In order to institutionalise cooperation and the exchange of information regarding large-value payment systems in the EU, banking supervisors and payment system overseers from all EU member states concluded a memorandum of understanding, which came into force on 1 January 2001. An exchange of information between banking supervisors and payment system overseers in Germany also occurs on a case by case basis in respect of retail payment systems and the monitoring of new developments in the payments market.

1.2.3 Payment systems of the Bundesbank

The third pillar of the Bundesbank's activities in the field of payment systems comprises the operation of its own systems. The Bundesbank plays a greater role in individual or large-value payments than in retail payments because of their significance for monetary policy. The Bundesbank is actively involved in processing payments, with the aim of achieving the following goals:

- obtaining an adequate share of cashless payments in general;
- having, in particular, a vested interest in the processing of individual payments;
- participating in retail payments in a complementary manner;
- providing payment systems/services which are neutral with regard to competition;
- promoting safe and efficient procedures; and
- contributing towards a reduction in processing times.

The Bundesbank fulfils its statutory task of ensuring the processing of domestic and cross-border payments by providing clearing and settlement services available to the credit institutions in the various banking groups and offering its services in the area of cashless payment transactions to holders of Bundesbank accounts in 47 branches (as at year-end 2011). Credit institutions have the option of using the Bundesbank's facilities instead of private giro networks, bilateral clearing arrangements or other clearing options. Since the Bundesbank's payment systems are designated under the Settlement Finality Directive (SFD), payment institutions are not given access to the Bundesbank's payment systems as direct participants. However, for the processing of credit transfers the Bundesbank offers them a kind of indirect access to TARGET2 and the Retail Payment System including SEPA Credit Transfer.

Owing to its relevance for monetary policy and financial market stability, the Bundesbank pays particular attention to the processing and settlement of individual payments. These payments are processed through the Bundesbank's RTGS system "TARGET2-Bundesbank", which, therefore, is of key importance to the German financial sector. Together with the Bank of Italy and the Bank of France, and in coordination with the banking sector, the Bundesbank, in its role as providing central bank, developed and now operates the liquidity-saving real-time gross settlement system TARGET2. It went live on 19 November 2007 and replaced its predecessor system, TARGET, with a step by step approach, organised in three country windows between November 2007 and May 2008. Compared to TARGET, TARGET2 provides further functional and technical enhancements. It is based on the SSP, but legally structured as a multiplicity of RTGS systems. Each participating central bank operates its own so-called TARGET2 component system. The Bundesbank, in its role as participating central bank, moved to TARGET2 in November 2007 and started operating its TARGET2 component system TARGET2-Bundesbank, which accounts for roughly half of the payments in terms of volume and around one third in terms of turnover of the whole TARGET2 system. By that time, the Bundesbank's former RTGS system, RTGS^{plus}, which was also part of the decentralised TARGET system, had been closed. In TARGET2-Bundesbank, banks established in the EEA may participate directly or indirectly via a direct participating commercial bank. Banks worldwide may also be registered as addressable BIC holders by direct participants. In addition, ancillary systems may settle their cash transactions in TARGET2 by using a harmonised set of dedicated cash settlement services.

The Bundesbank also offers an electronic procedure intended specifically for the handling of mass payments (credit transfers, cheques and direct debits), the RPS. The Bundesbank's operational role in this field is solely motivated by public interests. It is not designed to replace private sector activity, but rather to complement it where necessary and correct any market inefficiencies. It gives the traditionally heavily decentralised German banking industry access to euro clearing services that is neutral in terms of its effect on competition. All German banks can be directly accessed via the RPS, since they hold accounts at the Bundesbank. As Germany has no domestic ACH, and in line with the mandate in the Statute of the ESCB (which allows for an active provision of services to the market) it still appears necessary for the Bundesbank to maintain its range of services in retail payments in order to ensure complementary and open access to European retail payments, particularly for small and medium-sized credit institutions.

In addition to its clearing systems TARGET2-Bundesbank and RPS, the Bundesbank operates the Customer Access Mechanism (CAM). The CAM provides access for non-banks to TARGET2 as well as the liquidity bridge for banks between their Bundesbank home accounts (held eg for minimum reserve purposes) and their TARGET2-Bundesbank accounts. In addition to this service, the CAM carries out the Bundesbank's correspondent banking service as regards the processing of euro and foreign currency payments. The service is provided to all account holders of the Bundesbank, ie to banks and non-banks. Additionally, the Bundesbank provides the cross-border payment service MASSE, which is particularly used for recurring payments, especially by the German government, eg pension payments in favour of beneficiaries outside Germany.

1.2.4 Settlement and account services

A prerequisite for using the facilities offered by the Bundesbank for cashless payments is to keep a current account with the Bundesbank.¹ The Bundesbank primarily manages current accounts for banks, payment institutions and public authorities. In accordance with a decision by the Board of the Bundesbank on 31 December 2003, the Bundesbank closed the accounts held by corporates and left this activity exclusively in the hands of the private sector. Subject to authorisation from BaFin pursuant to Section 8 (1) of the ZAG, cash-in-transit companies as a payment institution can also hold accounts. Apart from minimum reserve balances, current accounts held with the Bundesbank do not bear interest. 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 any delay in the processing of payments in the course of the day, credit institutions may overdraw their current account up to the amount of collateral existing within the framework of the marginal lending facility. Debit balances at the end of a business day (resulting from intraday credit granted by the 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 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 TARGET2.

1.2.5 Pricing policy

The pricing policy and the concrete pricing schemes for the Bundesbank's cashless payment services are laid down by the Executive Board of the Bundesbank. Actual pricing is generally based on the cost recovery principle. Furthermore, the Bundesbank supports efficient procedures, for example, by charging higher fees for paper-based orders.

1.2.6 General Terms and Conditions

The general provisions of the BGB and the German Commercial Code, as well as the various payment agreements concluded between the banking industry and the Bundesbank, also apply to the Bundesbank with regard to its role in operations. The relationship between the Bundesbank and the user of its services is described in the General Terms and Conditions.

Through its General Terms and Conditions, 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, by actively providing services of its own, it may exert a certain influence on the terms and conditions offered by payment service providers.

¹ TARGET2-Bundesbank remote participants only require an RTGS account in TARGET2-Bundesbank.

1.3 The role of other private and public sector bodies

Both payment service providers and the Bundesbank supply the economy and the public with cash and process cashless payments. At the end of 2009 payment service providers held a total of 95 million current accounts for non-banks. In addition, credit card companies process payments resulting from credit card transactions via their own networks.

In Germany there are, overall, 1,919 credit institutions with about 40,083 branches (as at end-2010). The predominant type of bank in Germany is the universal bank which is engaged in several or all types of financial business. In addition, there are specialised institutions including, for example, mortgage banks, building and loan associations, and the promotional KfW banking group. At the end of 2010 there were 11 payment institutions in Germany that were permitted to conduct payment services pursuant to the KWG before the transposition of the PSD into national law took place. Banks in Germany can be classified into three main groups – often referred to as the three-pillar structure of the German banking system: commercial banks, public sector savings banks and Landesbanken as well as cooperative banks.

The DK, which was formed as the umbrella organisation of the credit sector associations of the German banking industry, assumes an important role in German payments. The DK and the Bundesbank draw up various payment agreements, which are the most important basis for interbank payments. This also includes the creation of new technical standards and the adoption of existing standards (eg data formats). The agreed procedures and standards are binding for all credit institutions which are members of the associations forming the DK. Institutions which are not members of a credit sector association and payment institutions must accept the various agreements by specific contractual arrangement before taking part in the interbank clearing. The DK is also leading the implementation and migration efforts for SEPA in association with the Bundesbank.

2. Payment media used by non-banks

2.1 Cash payments

The euro is the currency used in Germany and was introduced on 1 January 1999. At that time it only existed as deposit money or as electronically stored units of value, with banknotes and coins continuing to be denominated in Deutsche Mark (DEM). Following its introduction as cash on 1 January 2002, euro banknotes and coins became legal tender in Germany, but there is no obligation to accept more than 50 coins or in the case of commemorative coins no more than EUR 200. Moreover, the Bundesbank still exchanges Deutsche Mark for euros.

Euro banknotes are available in seven denominations (EUR 5, 10, 20, 50, 100, 200 and 500) and coins in eight denominations (1, 2, 5, 10, 20 and 50 cents, EUR 1 and EUR 2). The German 1, 2 and 5 cent coins have an oak twig on the back, the other cent coins a picture of the Brandenburg Gate in Berlin, and the euro coins the federal eagle as the German heraldic animal. Furthermore, in 2006 the Ministry of Finance started to issue a series of EUR 2 commemorative coins with the same technical features as the normal EUR 2 coins in Germany. In addition, there are very small quantities of EUR 10 coins, although these are primarily for collectors and therefore rarely used in payment transactions.

Although the share of card-based payments is rising continuously, cash payments still accounted for 58.4%² of the total turnover at retailers in 2010.

2.2 Non-cash payments

2.2.1 Non-cash payment instruments

In Germany, cashless payments are mainly effected by means of direct debits (50.2% of the total number of cashless payment transactions in 2010) and credit transfers (33.9%). Card payments (except for e-money cards) account for around 15.5% of the total. The use of cheques has decreased continuously to 0.3%, and e-money payment transactions are still insignificant (less than 1%).

2.2.1.1 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 slightly in recent years, as more convenient 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 rental payments), bank customers also have the possibility of providing their bank with instructions to set up a standing order; in this case the bank is then responsible for monitoring the timely execution of transfers (eg on the last day of the month).

In 2010 more than 5.8 billion credit transfers were processed by the German banking industry. Of these, 4.9 billion were submitted to banks by customers via a PC or terminal. As the number of internet-linked accounts increases in Germany and customers accept the use of internet and mobile infrastructure for accessing their banks, this number is expected to increase further. Moreover, customers who are willing to keep their account online may also profit from lower account administration charges.

In accordance with the Credit Transfer Agreement between the central associations of the German banking industry and the Bundesbank, every credit transfer is to be processed within the interbank relationship between credit institutions in a fully automated and paperless form. Thus, accepting institutions are obliged to convert credit transfers from a paper-based to a paperless form, ie to electronic files to be forwarded, to a very large extent, via data telecommunication or, in some cases, via data media.

In the light of the creation of SEPA, the SEPA Credit Transfer (see the descriptive Red Book chapter on the euro area) was introduced on 28 January 2008. More than 1,800 German banks have adhered to the SEPA Credit Transfer, so almost full reachability is ensured. Since its introduction, the use of the SEPA Credit Transfer has steadily increased; in the second half of 2010 it accounted for 0.8% of the total volume of credit transfers processed in Germany.

2.2.1.2 Direct debits

The direct debit, introduced by the German banking industry in 1963, has considerably simplified the collection of periodically payable monetary claims (subscriptions, fees, taxes, etc).

² Figures collected by the German Retail Institute (EHI) based on a data collection about the usage of payment instruments in the German retail sector (narrow sense, ie excluding car and mineral oil retail companies, pharmacies, mail order).

In Germany the direct debit is the most widely used payment instrument. In 2010 as many as 8.4 billion direct debits were processed by the German banking industry.

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

In November 1993 the direct debit became the first payment instrument to be processed fully electronically between banks as part of the general conversion obligation introduced on the basis of the Direct Debit Agreement. Since then it has been handled in a wholly paperless form for interbank transactions.

On 2 November 2009 the SEPA Direct Debit (see the descriptive Red Book chapter on the euro area) was launched in Germany. Currently, around 1.700 German banks have signed the corresponding EPC adherence agreements. However, the use of the SEPA Direct Debit procedures is still insignificant.

2.2.1.3 Cheques

With the trend towards paperless payment processing and on account of the increase in more efficient debit card payments, the importance of the cheque is steadily decreasing. In 2010, in terms of volume it accounted for a mere 0.3% of all cashless transactions, and in terms of value just 0.4%.

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 cheques drawn on the Bundesbank. Where requested 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 on which it is drawn.

With the automation of cashless payment transactions, the fact that a cheque needs to be physically presented (payable at sight) has proved to be one of its key disadvantages. However, in 1985 the DK and the Bundesbank agreed on a paperless cheque collection procedure (formerly called the BSE Agreement, now part of the Cheque Agreement). The paperless cheque collection procedure (BSE procedure) is used solely for cheques for less than EUR 6,000 owing to the inherent risk stemming from not physically presenting the cheque. Under this procedure, the countervalue of truncated cheques is collected in paperless form; the original cheque does not need to be presented. In principle, the first collecting institution is responsible for truncating the cheque data into electronic data records. It should also examine these cheques for compliance with formal and legal requirements. Credit institutions can collect the countervalues of BSE cheques either through the Bundesbank's RPS or through other channels, eg their own giro networks.

The DK and the Bundesbank have modernised and simplified the collection procedure for large-value cheques (ie for an amount of EUR 6,000 or more as well as other collection items which do not meet the BSE criteria). On 3 September 2007 the former large-value cheque collection procedure with separate presentation of the original cheque (GSE procedure) was replaced by the image-based cheque collection procedure (ISE). In ISE the paper-based cheque is replaced by an electronic image of the cheque, which is submitted together with the associated payment transaction to the Bundesbank as the clearing house according to Article 31 of the Cheques Act. The ISE significantly reduced the costs and also the time required for collection.

The German Ministry of Justice (Bundesministerium der Justiz) established the legal requirement for the ISE method with the amendment to the Regulation concerning clearing houses for cheque payments (Abrechnungsstellenverordnung) in October 2005. This

equates the submission to the clearing house of an electronic image that displays the entire front and reverse of a cheque with submission of the original cheque. The Bundesbank forwards the image and clearing data record of a correctly submitted cheque to the relevant credit institution, which then checks the image to decide whether the cheque should be honoured. Settlement reversals for cheques that were not honoured must also be cleared by the Bundesbank, which issues a declaration within the meaning of Article 40(3) of the Cheques Act to determine that the cheque has been delivered in due time and has not been paid. The Bundesbank delivers this declaration to the cheque submitter, upon request, so that cheque proceedings can be held.

2.2.1.4 Payment cards

The use of cards at retailers is increasing steadily. Debit card payments accounted for approximately 20.2%, credit card payments for 5.2% and payments via the electronic direct debit system (ELV) for 12.3% of the total turnover at retailers in 2010.³

Debit cards

Debit cards are usually issued by banks to the cardholder in combination with an account opening. In general, they can be used for withdrawals at cash dispensers of the issuing bank or at other banks, and for making cashless payments at point-of-sale terminals (in shops, at vending machines etc). Furthermore, they can be employed at banks' self-service terminals (eg to initiate credit transfers) and statement printers. The number of these cards has grown rapidly over the past decade. Today, more than 102 million cards have been issued in Germany with a population of approximately 82 million.

For the cards described above, the German banking community in 2007 introduced the brand name "girocard", which is the superordinate and neutral umbrella brand for both debit schemes, electronic cash (POS) and the German ATM System (Deutsches Geldautomaten-System – DGS, see Section 2.2.2). It guarantees the secure and easy use of debit cards using a PIN. The intention of the new branding was not only to simplify recognition of the scheme but also to facilitate the international acceptance of German debit cards in the SEPA region. To enable customers to make cross-border transactions, girocards are generally co-branded with one of the international debit card schemes Maestro or V-Pay.

The migration to chip technology that took place in the course of SEPA also allows for offline authorisation of guaranteed card payments. In addition, most girocards today also feature the chip-based e-money function GeldKarte established by the DK.

A new type of debit card is the loyalty card with a payment function. The major difference is that such cards are not issued by a customer's account holding bank under the girocard brand but by a loyalty programme in cooperation with a chosen bank. Customers have to indicate a reference bank account from which all card transactions will be deducted, so that no extra account has to be opened in conjunction with this card. The market share of these decoupled debit cards is, however, comparatively low.

There is no special system for the clearing and settlement of electronic cash transactions with banks. The respective payments are processed using the same standards and infrastructures as for direct debits.

Girocard – electronic cash

In February 1990 the banking sector drew up an agreement on an interbank system of cashless payments at automatic cashpoints (electronic cash). The system was introduced to

³ Figures collected by the German Retail Institute (EHI).

the market in 1991. Under the electronic cash 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 and the matching, confidential PIN. Once customers have entered their PIN, an authorisation request is directed to the authorisation centre of the issuing bank through the network operator. The authorisation centre checks the confidential PIN, the credit balance and/or credit line and whether the card is listed in a blocking file. If the answer is positive, the card-issuing bank guarantees the merchant payment of the amount requested. A charge of 0.3% of turnover (minimum EUR 0.08) is levied on merchants for these transactions. However, in light of negotiations between certain retailers and the banking community, there has recently been a tendency towards lower fees.

In 2010 electronic cash reached 1,926 million transactions according to the DK. The banking industry expects a further increase in the use of electronic cash owing to the high level of security and the guaranteed execution of payments at the point of sale.

A further variant of the electronic cash scheme is the electronic cash offline system, which was designed in cooperation with the banking industry and is based on chip technology, allowing for the offline authorisation of transactions. Here, the PIN entered in the course of a transaction is validated in the card's chip. Issuing banks may determine optional limits stored in the chip up to which offline authorisation is acceptable. The first limit relates to the maximum time period and the second to the maximum aggregated value of transactions without online authorisation. For their decision on using one or both of these limits the issuing banks will mainly take into consideration their own risk assessment and the costs related to online authorisations.

Currently, the electronic cash system is working to adapt to the SEPA. Furthermore, since September 2005 the DK has offered electronic cash for Europe-wide issuing and acquiring. Electronic cash has joined the "EAPS initiative" in order to establish an interlinking between national debit card schemes in Europe.

Electronic direct debit system

Independently of banks' electronic cash debit scheme and without involving the banking sector, the retail industry has developed the electronic direct debit system (ELV) as an alternative for payments by debit card. ELV builds on the availability of the customer's bank data on the bank card's magnetic stripe. These data are read out at the POS terminal and used to generate a direct debit, which the customer mandates by a signature. A major advantage for the retailer in the ELV system is that no scheme-related fees are due for such payments. However, there is a risk of a financial loss for the merchant because direct debits might be returned on account of a refusal, a lack of cover, or possibly because the card has been blocked. These risks are basically borne solely by the retail outlet as ELV does not provide a payment guarantee. For an extra fee, service providers offer insurance for merchants to mitigate the risk of financial losses.

Credit cards

The usage of credit cards⁴ has increased over the past few years, but still remains significantly lower than that of debit cards. The number of credit cards issued by banks and licensed by the major card organisations (MasterCard and Visa) grew from approximately 24.2 million at the end of 2009 to 25.3 million at the end of 2010. At the same time, the

⁴ 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 text 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.

number of acceptance points (especially in the retail sector, e-commerce and the hotel business) has also increased. In 2010 the value of credit card payments made by German cardholders amounted to a total of roughly EUR 44 billion.

Notwithstanding the upward trend in the usage of credit cards, their relevance is still limited compared to other payment instruments, eg debit cards. Owing to the commission charges, which are calculated based on the total amount of the bill and payable by the merchant, credit cards are not always popular in the retail trade. Debit cards, issued by banks and available to nearly all customers, provide retailers a less costly alternative to credit cards. Thus, the use of credit cards tends to be restricted to more upmarket retail outlets.

Prepaid cards

Among the multifunctional prepaid card products in Germany, only the GeldKarte system of the DK has so far achieved any significance in terms of use and the number of points of acceptance.

GeldKarte is a chip-based, prepaid rechargeable electronic purse scheme operated by the DK. It has, since its introduction in 1996, shown a slow but steady rise in points of acceptance (about 600,000 acceptance points⁵) and in use (5.5 million recharging transactions in 2010). At the beginning of 2011 around 88 million cards with the GeldKarte feature had been issued, not all of them, however, being actively used. The GeldKarte function is currently integrated into more than 96% of debit cards with the girocard brand issued by the participating credit institutions. Furthermore, the GeldKarte function is also supported by a small number of white cards, which are not linked to a bank account. The range of acceptance points is diverse. The most important acceptance points are public transport ticket machines, parking ticket machines and vending machines for cigarettes. The average value per transaction has decreased, to around EUR 3.02 in 2010.

To increase the still low transaction volumes, the GeldKarte chip was equipped with additional features such as age verification and contactless technology. The age verification via GeldKarte is now mandatory at cigarette vending machines in Germany. A first pilot of the upgraded contactless GeldKarte was introduced in 2009.

Other prepaid payment services have been introduced based on eg scratch-cards (Paysafecard, Deutsche Telekom Micromoney) and also on existing debit and credit card products. These cards might also be offered as gift cards or as an electronic form of traveller's cheques etc.

Retailer cards

Retailer 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 cards. With the largest issuer in Germany, 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 present, there are around 10 million⁶ retailer cards with payment functions in circulation. Retailer cards provide the retail trade with exact information on customers and their purchasing profiles.

⁵ Figures for GeldKarte collected by EURO Kartensysteme GmbH.

⁶ Figures are collected by PaySys GmbH.

2.2.1.5 Innovative payment procedures

Online banking-based internet payments

The number of internet/PC-linked overnight deposit accounts in Germany has grown further, to around 45 million (or 48% of the total) at end-2010. The number of online credit transfers in 2010 amounted to 12.5% of all payment transactions (15.9% of the total value of transactions). Based on the widespread acceptance of online banking, German credit institutions launched an internet payment service called giro pay in 2006. When customers choose to pay for their online purchases via giro pay they are directed from a retailer's website to their own bank's internet banking domain. After logging into their account with account number and PIN, giro pay automatically presents a remittance slip filled in with all relevant transaction information, so that the customer simply needs to confirm the transaction by means of the usual authorisation procedure. The payment is immediately guaranteed to the retailer. The use of giro pay has been growing steadily over recent years.

Other internet payment services

The strong growth of e-commerce during the last decade has motivated various new payment services on the internet. Most of these services have evolved in relation to the payment of online merchants. In Germany two basic types can be distinguished. The first model requires a registration of potential users. Some of these services assign customers their own personal account. To use this account customers first have to load it with funds which is usually possible via common payment methods such as credit transfers or card payments. The funds stored on the customer's account can be used not only for person-to-business but also for person-to-person payments. A variant of this model does not include a personal (prepaid) account, as the users only need to lodge their chosen payment method and data (eg data of bank account, credit card number, etc) with the provider. The service provider will use these data to collect the funds from the customer according to the payments the latter initiated via the service. Prominent examples of such services are eg PayPal, ClickandBuy and moneybookers.

The second model does not require a registration and users therefore remain anonymous vis-à-vis the payment service. Customers have to buy prepaid value in the respective schemes and will receive an e-voucher, a virtual card or a physical card in return. These usually hold a PIN number that is required for the initiation of payments via the internet. Two examples for this kind of service are the Paysafecard and MicroMoney.

Although the services described enjoy a growing popularity among German customers, their practical relevance is still limited. This is mainly because even in the online environment people tend to prefer established payment instruments like direct debits, credit transfers or credit cards.

Cumulative collection procedures

Apart from payments on the internet, innovative payment services have also evolved in relation to mobile commerce, ie the download of mobile content such as ring tones or video clips. These services can be purchased just by dialling a specific telephone number. The fees amount to only a few euros and hence fall into the micropayments domain. Because telecommunication companies already have an established customer relationship and the necessary billing solutions, they have also developed procedures for paying for mobile content. Depending on the customer's individual contract with the telecommunication company, the countervalue might be charged in different ways: in the case of a prepaid account it will be deducted from the preloaded funds on the customer account, and in the case of a post-paid contract the service charge is added to the regular telephone bill and collected via direct debit accordingly. As a result, virtually all mobile phone users in Germany can use these services spontaneously and without any further registration requirements.

2.2.1.6 *Mobile payments*

Mobile payments so far only play a minor role in the Germany. Several initiatives have emerged in recent years, but many of these have ceased operation in the meantime. The lack of success owes to a number of reasons related to both the German payments market and the innovations themselves. A basic characteristic of the German payments market is that almost all people hold a bank account and thereby have access to the well established and efficient payment landscape in Germany. As regards the mobile payment services, many initiatives failed because they did not offer customers additional benefits such as increased usability and comfort. Closely related to this, the initiatives did not succeed in reaching a critical mass of acceptance points. Thus usage remained restricted to some niche scenarios and customer attention rather limited.

Nevertheless, a small number of mobile payment solutions for various purposes are offered or under development. The largest German railway operator Deutsche Bahn AG, for example, runs a pilot for a mobile ticketing service, which builds on near field communication (NFC) technology and should become fully operational in 2011–12. The three major mobile network operators in Germany, Vodafone, O2 and Deutsche Telekom, jointly offer a mobile payment service usable for payments related to e-commerce. And finally, a number of municipalities in Germany have implemented mobile parking services.

Despite the fact that no significant usage exists so far, the increasing performance of mobile phones, particularly smartphones, and communication infrastructures are a promising basis for new convenient services offerings and a wider acceptance among customers.

2.2.2 *Non-cash payment terminals*

2.2.2.1 *German ATM System (Deutsches Geldautomaten-System – DGS)*

The DGS of the German banking industry offers customers of participating banks and savings banks the possibility to obtain cash up to a certain limit from approximately 60,000 cash dispensers nationwide (as of end-2010) using debit or credit cards in combination with a PIN. For all transactions at cash dispensers, an online connection to the authorisation centre of the issuing bank is established and a block and limit check is made in order to prevent fraudulent or other inadmissible withdrawals. Settlement of the transactions at cash dispensers is effected using the technical standards and infrastructures for direct debits.

Currently, the ATMs of the German banking industry are being upgraded step by step from magnetic stripe to EMV chip application as the preferred execution method. Fees for ATM withdrawals depend mainly on who is the owner of the ATM and who is the issuer of the card. Usually, banks do not charge their own customers any fees for the usage of their ATMs. If, however, the cardholder does not have an account with the bank operating the ATM concerned, the bank will most likely levy a fee for cash withdrawal. This fee has to be made transparent to the customer, so that the withdrawal procedure can be interrupted if the customer regards the fee as excessive. In order to extend the possibility for customers to obtain cash without incurring costs, banks in Germany have established four ATM networks within the DGS. The members of each network have agreed not to charge any fees to customers of banks in the same network.

2.2.2.2 *Terminals of the electronic cash system*

The DK – as the manager of the electronic cash scheme – licenses the network operators permitted to process the card transactions in the scheme and also approves the eligible terminals according to specific functional and security requirements. The licensed network operators are responsible for the installation of the electronic cash terminals with merchants, for their connection to the banking industry's authorisation centres for the electronic cash system, and for the technical support. Currently, 20 network operators are approved by the

DK. By the end of 2010, following a continuous increase, more than 670,000 POS terminals had been installed – mainly in petrol stations and retail outlets.

2.2.2.3 Cash Back

With the transposition of the PSD into national law, German retailers are now able to offer payouts in cash to their customers, without receiving a dedicated permission from BaFin. Currently, two big German supermarket chains have introduced this service as an alternative to cash withdrawals at ATMs. However, in order to ensure that customers do not exclusively use the Cash Back service, it is usually only provided under certain conditions, eg a purchase of goods for a fixed minimum sum. Although it is left to the retailer to charge fees for this service, it is in most cases free of charge for customers.

3. Payment systems (funds transfer systems)

3.1 General overview

In addition to TARGET2-Bundesbank, the Bundesbank operates a retail payment system for the clearing and settlement of both domestic and SEPA payments transactions.

3.2 Large-value payment systems

3.2.1 TARGET2

3.2.1.1 Institutional framework

The second generation of the Eurosystem's real-time gross settlement system for payments in euros with settlement in central bank money, TARGET2 (Trans-European Automated Real-time Gross settlement Express Transfer), was introduced in 2007. It replaced its predecessor system TARGET and in Germany the domestic system RTGS^{plus}. While TARGET2 is based on a single technical platform, it is legally structured as a multiplicity of RTGS systems, and each participating central bank operates its own so-called TARGET2 component system. TARGET2-Bundesbank is the Bundesbank's TARGET2 component system. As the TARGET2 service is harmonised for all central banks (see the descriptive Red Book chapter on the euro area), in this chapter we will focus only on aspects of the Bundesbank's part of the TARGET2 system.

3.2.1.2 Participation

At the end of December 2011, 241 direct participants held accounts in TARGET2-Bundesbank. Via these direct participants, roughly 17,900 further institutions worldwide were addressable. This number represents around one third of all addressable institutions in TARGET2.

As in previous years, in 2011 TARGET2-Bundesbank was the biggest TARGET2 component system of the TARGET2 single shared platform. In terms of volume, the share amounts to roughly 50%, and in terms of value around one third.

3.2.1.3 Types of transactions

TARGET2-Bundesbank processes domestic and cross-border euro payments between credit institutions located in Germany, but also those located abroad (eg the United Kingdom, Sweden).

In addition, different ancillary systems are connected to TARGET2-Bundesbank in order to settle the cash leg of their business. Amongst these systems is one of the biggest securities

settlement systems (Clearstream Banking Frankfurt) as well as one of the most important CCPs (Eurex Clearing) in Europe.

3.2.1.4 Risk management

In addition to the common risk management procedures in TARGET2, the Bundesbank has agreed individual contingency arrangements with critical participants (including banks and ancillary systems) in order to further mitigate operational risks.

3.2.1.5 Major ongoing and future projects

Currently, and in addition to their accounts in TARGET2-Bundesbank, banks hold accounts in a proprietary home accounting system of the Bundesbank for purposes of minimum reserves, standing facilities and the settlement of Eurosystem open market operations. These accounts, and the business cases they are used for, will be migrated to TARGET2-Bundesbank.

3.3 Retail payment systems

The majority of payments are cleared within giro networks operated by each of the three banking groups (commercial banks, savings banks and cooperative banks) in Germany. In addition, the Bundesbank runs its retail payment system available to all banks (see Section 3.3.1) and complements the service offerings of the private banking sector. 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 commercial banks can nowadays be regarded as internal networks. The networks have evolved over time with the aim of processing legacy retail payments cost-efficiently and of keeping the liquidity within the credit institution or at least the banking groups as long as possible. With the advent of the SEPA, considerations are under way to enhance the existing networks for the processing of SEPA payments.

For the interbank clearing of retail payments beyond an 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 Bundesbank and/or in a garage/car park of a commercial bank. Nowadays, the payment transaction data is mainly exchanged via data telecommunication channels and the settlement of the bilaterally exchanged data is effected in central bank money on TARGET2 accounts.

3.3.1 Retail Payment System (RPS)

The RPS, owned and operated by the Bundesbank, is used both for the processing of credit transfers and collections (including direct debits, card payments and cheques) denominated in euros. The RPS complements the giro networks and the bilateral interbank clearing arrangements within the German banking industry with a cost-effective and reliable system ensuring nationwide coverage. As a contribution to the implementation of the SEPA, the RPS also clears and settles SEPA transactions. To ensure a maximum reach for SEPA transactions, the RPS is interconnected with other SEPA-compliant ACHs across Europe on a bilateral basis. In addition, the Bundesbank is a direct participant in the STEP2 system of EBA CLEARING.

In general, retail payments not requiring priority treatment are submitted in files to the RPS and batch-processed either intraday or overnight, depending on the time of submission. Currently, the RPS processes, on average, over 10 million transactions a day. The majority of these transactions (59%) are collection items (direct debits and cheques), leaving a share of 41% for credit transfers. Peak volumes amount to nearly 35 million transactions a day.

The electronic cheque collection in the RPS follows either a paperless or an image-based procedure. The processing time for RPS payments is, in general, one working day (a shorter time is possible, depending on the time of submission).

The settlement is done in central bank money on dedicated TARGET2 accounts of the submitting and the receiving party on the same day; the RPS is, therefore, float-free.

3.3.1.1 Institutional framework

The RPS is owned and operated by the Bundesbank. The legal basis for the processing of retail payment transactions in Germany is provided by different public law regulations (eg BGB, BBankG, KWG, tax code), private law regulations (such as legal standards as well as agreements and arrangements between the central associations representing the banking industry and the Bundesbank) and international legal acts and standards (such as EC regulations, EC directives and industry standards). The rules under which the RPS operates are laid down in the General Terms and Conditions of the Bundesbank as well as the various Procedural Rules for individual components and services of the RPS. The RPS is subject to payment systems oversight of the oversight section of the Bundesbank. It has furthermore been notified as a designated payment system within the meaning of Article 10 of the SFD.

3.3.1.2 Participation

Financial institutions that hold an account with the Bundesbank and meet the technical requirements can participate in the domestic legacy clearing service of the RPS on an open and non-discriminatory basis. Currently, more than 220 banks in Germany actively use this service. Direct participation or indirect participation via a direct participant is possible. Other Bundesbank account holders (mostly public authorities) may also use the RPS. From a legal point of view, these are customers of the Bundesbank and participate via the Bundesbank.

A total of 156 financial institutions participate directly in the SEPA services of the RPS, some of them being banks that are incorporated in other SEPA countries. About 2,400 financial institutions participate indirectly, that is, via a direct participant, in the SEPA services of the RPS. The Bundesbank itself – in its capacity as a bank – participates in the SEPA services of the RPS to facilitate the processing of SEPA payments received from its own customers (the aforementioned other account holders that are mostly public authorities).

3.3.1.3 Types of transactions

As an active contribution of the Bundesbank to the implementation of the SEPA, RPS has offered the processing of SEPA Credit Transfers and SEPA Direct Debits since the respective start dates of the payment schemes. To achieve efficient reachability of other participating financial institutions, several links to other clearing infrastructures (clearing and settlement mechanisms) have been established, such as to the STEP2 system of EBA CLEARING, CS.I of the Austrian central bank (OeNB), EKS of the Bank of Latvia, Spain's Iberpay, Equens and BISERA7-EUR of BORICA-BANKSERVICE BULGARIA. The Bundesbank is not only connected via its RPS as a technical facilitator to the STEP2 system of EBA CLEARING for the purpose of maintaining an interoperability link, but is also registered as a direct participant in the STEP2 system and thereby offers its own participants the possibility to connect via the Bundesbank indirectly to the STEP2 system.

In the domestic context, the RPS is used to process paperless legacy credit transfers and direct debits of any value. With regard to domestic cheque collection items, both paperless and image-based collection items can be processed electronically via the RPS.

3.3.1.4 Operation of the system and settlement procedures

From a technical point of view, the RPS supports SWIFTNet FileAct as a globally used communication channel and the Electronic Banking Internet Communication Standard (EBICS) as a communication procedure based on an internet protocol (IP) for the electronic submission and delivery of retail payments. Banks are only allowed to use one of the aforementioned communication channels for their connection to the RPS and the transmission of retail payment messages.

In addition to electronic communication channels (EBICS as well as an online banking interface), non-banks (eg public authorities) are allowed to use a paper-based procedure for submitting payment orders to the Bundesbank.

The RPS processes submitted payment orders according to batch-processing procedures:

The payment messages corresponding to submitted payment orders are cleared in several same-day and overnight processing windows. Each window has a cutoff time for receiving payment messages and the processing begins directly after the cutoff time. This means that the output payment messages for the receiving banks are prepared and transmitted to them. In parallel, the settlement of the amounts corresponding to the processed payment messages is executed on the TARGET2 accounts of the banks involved. Payment messages are submitted to and received from the RPS in batches (physical files containing logical files) and the total amount of each logical file (incoming or outgoing) is settled (gross-settlement batch-orientated principle).

There is one exception to the settlement procedure described above: SEPA Direct Debits are processed by separating the clearing and settlement according to the respective business rules. The clearing is done on the business day of the submission of the SEPA Direct Debit payment message. However, the settlement of the corresponding amounts is executed at the determined due date, ie a certain number of days after the clearing of the related payment messages depending on the type of direct debit.

3.3.1.5 Risk management

Each (single or collective) domestic legacy payment is booked on a gross basis and revocation of the transaction is no longer possible once automatic processing has been launched; there is no credit risk – and generally no liquidity risk – for the receiving bank. The latter can make the incoming funds available to the final beneficiary without reservation. For legacy direct debits and cheques, the items are credited – in accordance with standard practice in the German banking industry – subject to collection. SEPA Credit Transfer transactions are booked according to the procedure used for domestic legacy payments. For the processing of SEPA Direct Debit transactions new monitoring tools have been devised. Banks that hold accounts at the Bundesbank are furthermore obliged to provide collateral in accordance with their respective credit line.

3.3.1.6 Pricing

As of 1 February 2011, payment files from banks, submitted via data telecommunication, are subject to a fee of EUR 0.0025 per transaction. This applies to SEPA transactions as well as domestic legacy collections and credit transfers. Banks may register as indirect STEP2 SEPA service participants of the Bundesbank. The Bundesbank passes on the respective registration and annual fees that are charged by EBA CLEARING for indirect STEP2 SEPA services participation.

For payments of non-banks that are processed via the RPS of the Bundesbank, domestic and cross-border payments submitted on paper or by data telecommunication are subject to a fee of EUR 0.08, EUR 0.05 or EUR 0.03 per transaction depending on whether those participants submit up to 100,000, up to 250,000, or more than 250,000 payments per month. As is the case for banks, these fees apply to all payments submitted by the participant. Additionally, paper-based orders are billed at EUR 3.00 per item.

Paper-based cheques are billed at EUR 0.60 (EUR 1.00 if the cheque does not conform to the cheque rules) per item. The sorting and delivery of image-based cheques is subject to a fee of EUR 0.05 per item, payable by the drawee of the cheque.

3.3.1.7 Major ongoing and future projects

Plans are under way to connect the RPS to other European SEPA-compliant ACHs in order to increase direct reach and to establish further efficient and reliable processing channels. The connections are envisaged to be created on the basis of interoperability standards as defined by the European Automated Clearinghouse Association (EACHA).

Furthermore, the Bundesbank closely monitors developments regarding a possible technical and business standardisation for the clearing of SEPA card payments.

4. Systems for clearing and securities settlement

4.1 General overview

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 markets regulated by the EU (EU-regulated markets) and markets regulated by the stock exchanges themselves (regulated unofficial markets). At the FWB® Frankfurter Wertpapierbörse (Frankfurt Stock Exchange), a listing on the *Regulated Market* leads to the *General Standard* or its *Prime Standard* segment. A listing in the *Open Market (Regulated Unofficial Market)*, on the other hand, can lead to the *First Quotation Board* or *Entry Standard*. Issuers in General Standard or Prime Standard fulfil the highest European transparency requirements. The Entry Standard is a segment of the Open Market with slightly higher reporting standards (see diagram below). Generally, the listing requirements and subsequent obligations in relation to securities vary according to the market segments concerned.



Source: Deutsche Börse Group 2011.

In Germany, shares are currently order-driven and floor-traded by brokers on seven stock exchanges. The stock exchanges are located in Berlin, Düsseldorf, Frankfurt/Main, Hamburg, Hanover, Munich and Stuttgart.

In addition, stock market participants use the electronic trading system Xetra operated by the FWB®. 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.

The *Regulated Market*⁷ is an organised market within the meaning of § 2 paragraph 5 of the Securities Trading Act (Wertpapierhandelsgesetz or WpHG). Prior to trading, the issuer of the securities must file an application for admission to the Regulated Market together with a bank, a financial service provider or a company which operates in accordance with § 53 paragraph 1 sentence 1, or § 53b paragraph 1 sentence 1 of the Banking Act, to the Admissions Office of FWB®. The bank or company must be admitted to a domestic stock exchange with the right to participate in trading and submit proof of a liable capital of EUR 730,000. If the issuing company itself fulfils these conditions, it may file the application for admission alone.

The details governing an admission and the follow-up obligations are regulated in the Stock Exchange Act, the Stock Exchange Admission Regulation, the Prospectus Act and the Exchange Rules.⁸

Prior to its first listing, the issuer company must fulfil certain criteria: the company must have existed for at least three years and have issued at least 10,000 shares; 25% of the shares must be owned by diversified holdings. In addition, the company must provide an admission prospectus with information about the actual and legal circumstances which are essential for the assessment of the issuer and the security. The listing prospectus must be accurate and complete and provide details of the balance sheet, the profit and loss account, and the capital stream from the past three years. The management report of the last fiscal year must also be included. The language of publication is German and, for foreign issuers, English. The decision-making body is the Admissions Office of the FWB®.

General Standard is the stock listing segment of Deutsche Börse AG for companies fulfilling the transparency requirement prescribed by German law. Admission to General Standard does not require any action on the issuers' part; it occurs automatically in connection with the listing on the Regulated Market. General Standard is basically the initial listing segment for smaller companies and is the segment with the minimum legal requirements of the Regulated Market.

General Standard is appropriate for companies which target national investors and opt for a cost-effective listing. German issuers are automatically included in CDAX.

Prime Standard is the listing segment for companies that fulfil especially high international standards on transparency. Admission to the prime standard segment requires the fulfilment of the following transparency criteria: quarterly reports, international accounting standards according to IAS or US GAAP, submission of a company calendar and ad hoc disclosures also in English. Companies that want to be listed in this segment must apply for admission. A prime standard listing is a prerequisite for inclusion in the selection indices of the FWB®. This segment is for companies wishing to position themselves vis-à-vis international investors.

In addition to the requirements of General Standard, which represent the statutory minimum requirements of the Regulated Market, Prime Standard Companies must comply with high

⁷ The division of the regulated markets into the market segments Official Market and Regulated Market has been removed. Since 1 November 2007, admission to Frankfurter Wertpapierbörse is solely to the so-called Regulated Market (General Standard), or a section of the regulated market with further follow-up mandatory reports (Prime Standard).

⁸ For further details regarding the main admission criteria and follow-up obligations, see Deutsche Börse Listing Guide.

international transparency standards. Admission to Prime Standard is a prerequisite for inclusion in the selection indices DAX®, MDAX®, TecDAX® and SDAX®.

The *Regulated Unofficial Market* organised by Deutsche Börse AG at FWB® was renamed *Open Market* with effect from 10 October 2005. In addition to the Regulated Market, the Open Market, structured in First Quotation Board and Second Quotation Board, represents the second German market segment regulated by law.

However, in contrast to the Regulated Markets, the Open Market is not an official market segment, but governed by private law. A stock exchange may choose to provide this type of segment in accordance with article 48 of the Stock Exchange Act, if the securities included herein are neither listed nor included in the Regulated Markets and as long as orderly trading and business conduct can be guaranteed.

Besides German shares, mainly international shares, bonds of German and international issuers, certificates and warrants are traded on the Open Market. Shares from more than 60 countries are listed on the Open Market.

According to article 2, paragraph 5 of the WpHG, the Open Market does not represent an organised or regulated market. The inclusion of securities in the Open Market is governed by the Directives for the Regulated Unofficial Market of Deutsche Börse AG.

The inclusion of securities in exchange trading on the Open Market represents one of the easiest and fastest ways to the stock exchange. A registered trading member of the FWB® files the application for inclusion in exchange trading (by E-Listing via internet). As the organising body of the Open Market, Deutsche Börse AG decides on inclusion.

The issuer must fulfil only a few formal inclusion requirements and no follow-up obligations. Besides the order-driven and floor-traded stock exchanges and the electronic trading system Xetra, Eurex⁹ acts as an independent, fully electronic market for forward exchange transactions, ie both futures contracts and listed options are traded.

Eurex is a public company and is wholly owned by Deutsche Börse AG.¹⁰ It 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 and SOFFEX.

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 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.

⁹ Eurex is a derivatives exchange operating a fully electronic trading platform. Aside from this, Eurex provides an automated and integrated joint Clearing House (Eurex Clearing AG). Eurex Clearing AG offers central counterparty services for instruments traded on the Eurex exchanges, Eurex Bonds and Eurex Repo as well as the FWB and the Irish Stock Exchange.

¹⁰ SIX Group has sold its holding in the Eurex joint venture to Deutsche Börse AG. Before, the SIX Group had a 50% holding in the share capital and a 15% share in the financial result of Eurex.

Eurex Repo, which is a separate segment, is the electronic trading solution for repos (sale and repurchase agreements). This Eurex segment is one of the leading electronic repo market providers, and operates the Swiss Franc and Euro Repo Markets. Eurex Repo offers the entire value chain from trading through clearing and settlement. Eurex Repo GC Pooling® was developed jointly by Eurex Repo, Eurex Clearing AG and Clearstream Banking and launched in March 2005 with the purpose of delivering all the advantages of electronic trading, clearing through a CCP in combination with a centralised collateral management system. GC Pooling® is a cash-driven general collateral market of Eurex Repo® for euro and US dollar and offers a combination of collateralised money market trading with the efficiency and security of Eurex Clearing's CCP services. Trades are possible in different maturities. They are based on baskets of general collateral and can be seamlessly completed and then processed automatically in Eurex Clearing AG and Clearstream Banking. A further advantage of GC Pooling® is the possibility of reusing received collateral for further money market transactions and refinancing within the framework of Bundesbank credit operations.

In addition, the European Energy Exchange (EEX) 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 EEX 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.

Supervision of trading in securities and derivatives and exchange supervision in Germany is performed by BaFin, the supervisory authorities of the Länder¹¹ and the trading supervision authorities of the stock exchanges.

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

The supervision of securities and derivatives trading by BaFin serves the objectives of market transparency, market fairness and investor protection. As regards the ongoing supervision the main tasks of BaFin include checking that credit institutions have adequate own funds (Section 10 of the Banking Act). In addition, BaFin checks whether institutions have adequate liquidity, ie whether they invest their funds in such a way as to ensure that adequate liquidity for payment purposes is guaranteed at all times (Section 11 of the Banking Act) and supervises those risks which do not require capital backing under the Solvency Ordinance. Moreover, banking supervision implies monitoring compliance with German rules of conduct relating to customer transactions, international cooperation with regulatory and supervisory authorities responsible for securities exchanges, securities and derivatives trading in matters relating to the supervision of securities trading and the authorisation of foreign organised markets in Germany.

As a rule, the stock market supervisory authorities of the Länder are responsible for legal and market supervision. This includes mainly the supervision of compliance with stock exchange regulations, regulation of stock exchange trading and the processing of stock market transactions, 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. They are also responsible for authorising the authorisation of Alternative Trading Systems (ATs) domiciled in Germany.

¹¹ Germany is a federal state that consists of 16 Länder.

The HÜSt (Handelsüberwachungsstelle or Market Surveillance Office) 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 systems

4.2.1 Eurex Clearing AG

The clearing house for the cash, repo and derivatives trading systems is Eurex Clearing AG (Eurex Clearing). Eurex Clearing serves as the CCP for those transactions. As a CCP, the clearing house interposes itself as buyer to every seller and as seller to every buyer.

4.2.1.1 Types of assets and products cleared

Eurex Clearing clears for several trading facilities under the roof of the Deutsche Börse Group, but also for off-exchange trades (OTC). Products cleared comprise a wide range of cash, repo and derivative products.

4.2.1.2 Institutional framework

The German CCP Eurex Clearing is registered and operates under German law by which central counterparty clearing is defined as banking business. Thus, Eurex Clearing has a banking licence according to § 1 Section 1 (12) and Section 31 of the Banking Act.

As a credit institution, Eurex Clearing is licensed and supervised by BaFin and the Bundesbank. Supervision is carried out according to the general principles of allocation of supervisory tasks between BaFin and the Bundesbank laid down in the Banking Act and complementary agreements among those authorities. As a clearing and settlement system for financial instruments, Eurex Clearing is overseen by the Bundesbank based on § 3 of the Bundesbank Act. Furthermore, BaFin as an integrated financial supervisory authority takes into account the special role of the CCP for financial markets. The Bundesbank and BaFin apply the overall risk management provision of the Banking Act to require Eurex Clearing to meet the CPSS/IOSCO and ESCB-CESR Recommendations.

Since January 2012 the Eurex Group has been wholly owned by the German exchange holding. Until then, it was owned by the German and Swiss exchange holdings in equal parts following the merger of Deutsche Terminbörse and SOFFEX in 1998. As Eurex Clearing still clears for the German and the Swiss market, a Memorandum of Understanding has been signed by BaFin, the Bundesbank, the Swiss National Bank and the Swiss financial market supervisory authority FINMA. Eurex Clearing also provides clearing for the Dublin stock market. Eurex Clearing has obtained the status of a Recognised Overseas Clearing House (ROCH) from the UK FSA (Financial Services Authority). Eurex Clearing is also subject to supervision by the US Commodity Futures Trading Commission (CFTC) as a Multilateral Clearing Organization (MCO) as well as by the US Securities and Exchange Commission (SEC).

4.2.1.3 Participation

Eurex Clearing has objective and risk-based access and exit criteria which are publicly disclosed. Requirements for participants' financial resources and operational reliability are defined according to membership category and the types of services selected by the participants. All members must be regulated entities and must satisfy a minimum capital requirement. Eurex Clearing also reviews the external credit ratings of the applicants before approval and assesses participants' operational capability. The criteria for participation, such

as minimum capital requirements, contribution to clearing fund, financial information disclosure and rating, and location, are based on credit and legal risk considerations.

A clearing member can be either a general clearing member (which clears operations for its own account and on behalf of brokers) or a direct clearing member (which clears only its own trades or trades of its clients). Capital requirements are higher for general than for direct clearing members.

Compliance with financial and operational access criteria is reviewed before an applicant is granted participant status. Moreover, there is ongoing monitoring of continued compliance by participants with the access criteria.

4.2.1.4 Clearing process and arrangements for money settlements

Eurex Clearing acts as a CCP for the instruments admitted to its operations, ie a wide range of cash, repo and derivatives products. As Eurex Clearing's risk management system is closely connected to the trading platforms, a trade that has been agreed on the Eurex trading platforms is automatically accepted for clearing and Eurex Clearing becomes the counterparty of both the seller and the buyer (open offer). For OTC transactions, Eurex Clearing becomes the counterparty after agreeing to clear that trade (netting by novation).

The guarantee provided by Eurex Clearing contributes to the reduction of credit and liquidity risks associated with the trading and delivery of financial instruments traded on cash and repo markets as well as on derivatives markets.

Eurex Clearing has procedures in place for the delivery of securities. This is systematically used in the case of the clearing for the cash and repo markets where securities have to be delivered to both parties to the trades. It is also used in the derivatives markets if a transaction is not cash-settled, ie if the trade is not settled via an opposite trade. Eurex Clearing delivers the security to the buyer after it is received from the seller. This process is supported by a DVP and receipt-versus-payment (RVP) settlement eliminating principal risk.

4.2.1.5 Basic features of risk management

Eurex Clearing has a comprehensive risk management framework composed of objectives, measures and tools defined at the level of Eurex Clearing and that of the Deutsche Börse Group. Eurex Clearing's business continuity arrangements are developed at the level of the holding company and cover all sites, network control centres and business sites. At the Deutsche Börse Group level, there is a Group Risk Management (GRM) that defines the overall objectives and monitors the overall risk profile of DBG, including a comprehensive Business Continuity Management (BCM) policy, which defines the organisational roles and responsibilities, and the guiding principles to ensure operational resilience. The BCM arrangements also address the unavailability of systems, workspace or suppliers and the loss of significant numbers of staff in order to ensure the continuity of the critical operations in case of catastrophe scenarios.

The BCM policy ensures that the risk framework is implemented group-wide so that all risks are identified, centrally recorded and systemically assessed. Contingency plans and backup facilities are regularly tested with market participants and relevant parties, and maintained to ensure the resilience of Eurex Clearing.

Eurex Clearing monitors its participants' exposure on a real-time basis, and conducts intraday calls for margins. Eurex Clearing employs different tools to limit its exposures to potential losses from defaulting participants. Major measures include a high level of required capital, margin requirements and contributions to the clearing fund. The levels of margins are verified via back testing and stress testing calculations. Eurex Clearing can also require additional financial resources/margins from participants in situations when unusual trading activity is detected. The stress testing policies, assumptions and scenarios are discussed with market participants and the regulating authorities, and mitigating actions are available on the Eurex

website. Eurex Clearing default procedures are clearly stated in the system's rules and published on its website. Eurex Clearing accepts highly liquid collateral such as cash and government and covered bonds.

Initial margins are used to cover Eurex Clearing's risk on open positions of its clearing members, whereas variation margins are collected and paid out to reflect current exposures resulting from actual changes in market prices. To calculate variation margin, open positions are marked to current market prices and funds are paid to (or received from) a counterparty to settle any gains or losses on those positions. In addition, intraday margins are called if the positions of a clearing member change significantly owing to price variations or new trades. Margin payments are settled mainly in central bank money (via TARGET2 or the Swiss RTGS payment system). A limited number of margin payments are settled in commercial bank money in the United States in order to be able to collect intraday margins during the longer operating hours of the Eurex exchanges (up to 22:00 CET) and after the closure of the European payment systems (TARGET2 closes at 18:00).

Securities are settled on a DVP basis, in Clearstream Banking Frankfurt for the cash market and additionally in Clearstream Banking Luxembourg and Euroclear Bank Brussels for repos and derivatives.

Eurex Clearing's securities and cash associated with its clearing activities are held in national and international CSDs. Cash collateral is placed according to the Eurex Treasury and Credit Policy, which describes standards for approving market counterparts and treasury limits. Some private banks are used for the deposit of non-euro currencies, generally in the form of repos. Eurex investments in US dollars are carried out through repo transactions and the major US banks act as triparty agents.

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 CCP, 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.

4.2.1.6 Connection to trading systems

Eurex Clearing has currently two links with other CCPs, one with the Clearing Corporation (CCorp) and one with the European Commodity Clearing AG (ECC). ECC is a subsidiary of the EEX. Eurex Clearing has a sub-CCP relationship with the ECC. Where a counterparty is clearing a transaction conducted at the EEX via Eurex Clearing, Eurex Clearing simultaneously steps into the transaction in addition to ECC. The contractual relationship is simultaneously extended by Eurex Clearing as counterparty of ECC and the clearing member. Eurex Clearing has specific rules for linked CCPs in its clearing conditions.

In addition, Eurex Clearing has a special link to the CCorp. This so-called Global Clearing Link provides the US clearing community with direct access to European trading. It facilitates low-cost clearing access to Eurex Clearing from the United States and substantially reduces costs through margin offsets and collateral pooling between US dollar- and euro-denominated products.

4.2.1.7 Pricing

Eurex Clearing charges fees for clearing licences, connection fees as well as transaction fees. Transaction fees for derivative transactions relate to the consolidation/collection, administration and regulation of transactions on Eurex Deutschland and Eurex Zürich as well as OTC options and futures transactions. They include inter alia fees for matching of exchange transactions and recording of derivative transactions (Trade), cash settlement and

delivery. These fees are charged on a monthly basis. Parts of the fees may also be refunded on a monthly basis. In this respect, market-making and volume rebates are granted.

In addition, the clearing activities of Eurex Clearing may also be part of other services provided by other entities of Deutsche Börse Group. For these services Eurex Clearing also charges its customers.

Further details can be found in the price list on the Eurex Clearing website.

4.2.2 European Commodity Clearing AG (ECC)

ECC is a clearing house whose range of services comprises clearing and settlement for exchange and OTC transactions in energy and related products.

4.2.2.1 Types of assets and products cleared

Currently, ECC clears for the EEX, the British-Dutch exchange APX-ENDEX, the Hungarian HUPX, the French Powernext SA and EPEX SE, and the Austrian Central European Gas Hub (CEGH). ECC also clears OTC trades which are registered via those exchanges.

4.2.2.2 Institutional framework

ECC is registered and operates under German law, by which central counterparty clearing is defined as banking business. Thus, ECC has a banking licence according to § 1 Section 1 (12) and Section 31 of the Banking Act. As a credit institution, ECC is licensed by BaFin and supervised by BaFin and the Bundesbank. Supervision is carried out according to the general principles of allocation of supervisory tasks between BaFin and the Bundesbank laid down in the Banking Act and complementary agreements among those authorities.

ECC is a subsidiary of EEX. EEX was founded in 2002 as a result of the merger of the two German power exchanges Leipzig and Frankfurt. EEX itself provided the clearing services until the establishment of ECC in 2006.

4.2.2.3 Participation

ECC has objective and risk-based access and exit criteria which are publicly disclosed. Requirements for participants' financial resources and operational reliability are defined according to membership category and the types of services selected by the participants. All members must be regulated entities and must satisfy a minimum capital requirement. ECC also reviews the external credit ratings of the applicants before approval and assesses participants' operational capability. The criteria for participation, such as minimum capital requirements, contribution to clearing fund, financial information disclosure and rating, and location, are based on credit and legal risk considerations.

A clearing member can be either a general clearing member (which clears operations for its own account and on behalf of brokers) or a direct clearing member (which clears only its own trades or trades of its clients). Capital requirements are higher for general than for direct clearing members. ECC also has a licensing regime for non-clearing members.

Compliance with financial and operational access criteria is reviewed before an applicant is granted participant status. Moreover, there is ongoing monitoring of continued compliance by participants with the access criteria.

ECC can permit exceptions to the preconditions of paragraph 1 above in the case of central banks, CCPs or state-owned development banks with registered offices in a member state of the European Union, another contracting member state of the Agreement on the European Economic Area or Switzerland provided these companies or institutions are not banned from taking part in the ECC clearing procedure according to the legal provisions applicable to them.

4.2.2.4 Clearing process and arrangements for money settlements

ECC acts as a CCP for the instruments admitted to its operations, ie a wide range of energy and commodity contracts. The guarantee provided by ECC contributes to the reduction of credit and liquidity risks associated with the trading and delivery of those financial instruments. ECC has procedures in place for the delivery of the underlying instrument via its subsidiary European Commodity Clearing Luxembourg S.a.r.l (ECC Lux).

4.2.2.5 Basic features of risk management

ECC has a comprehensive risk management framework composed of objectives, measures and tools. ECC monitors its participants' exposure on a real-time basis, and conducts intraday calls for margins. ECC employs different tools to limit its exposures to potential losses from defaulting participants. Major measures include a high level of required capital, margin requirements and contributions to the clearing fund. The levels of margins are verified via back testing and stress testing calculations. ECC can also require additional financial resources/margins from participants in situations when unusual trading activity is detected.

Initial margins are used to cover ECC's risk on open positions of its clearing members, whereas variation margins are collected and paid out to reflect current exposures resulting from actual changes in market prices. To calculate variation margin, open positions are marked to current market prices and funds are paid to (or received from) a counterparty to settle any gains or losses on those positions. In addition, intraday margins are called if the positions of a clearing member change significantly owing to price variations or new trades. Margin payments are settled in central bank money via TARGET2.

4.2.2.6 Connection to trading systems

In cooperation with ECC, the primary CCP of EEX, Eurex Clearing provides clearing services for transactions in certain markets and in certain products (cooperation products) as a central counterparty (Sub-CCP) on the basis of a separate agreement (CCP-Sub-CCP Agreement). Physical settlement of all transactions for which ECC has assumed clearing is provided through European Commodity Clearing Luxembourg S.a.r.l. (ECC Lux), a subsidiary of ECC. ECC has a link with Eurex Clearing. ECC has specific rules for linked CCPs in its clearing conditions.

4.2.2.7 Pricing

ECC charges annual, technical, clearing and connection fees.

The annual fee, payable in advance, is charged for the use of the clearing and settlement systems by ECC.

The technical fee is charged for technical access to the clearing system Eurex Clearing. The fee has three components: a one-off setup fee for the technical establishment of the access, an annual connection fee and a one-off cancellation fee when the technical access is cancelled. The amount of the technical fees depends on the type of access chosen. The systems are accessible via internet access (iAccess), dedicated lines (Combined or Premium) or WebAccess. Different types of access for the settlement system Eurex Clearing can be chosen.

Setup fees are due for the provision of a new technical access and in case of a change of the type of access. Cancellation fees are due for the cancellation of a technical access and in case of a change of the type of access. Connection fees are due annually from the setup till the cancellation of a technical access. Connection fees are due quarterly in advance and are due already from the time the order is placed. The connection fee for a technical access is not charged if technical access already exists within the scope of the exchange membership at EEX, FWB® or Eurex or within the scope of its clearing membership with Eurex Clearing. The technical fees for the access types iAccess and dedicated lines (Combined or Premium)

are due per access to the settlement system Eurex Clearing. The technical fees for the access type WebAccess are due per user to the settlement system Eurex Clearing.

The clearing fees are charged for the clearing and settlement of trades. The clearing fees depend either on the executed volume in megawatt hours, tons of carbon dioxide or metric tons, respectively. Electricity tax, energy tax, grid usage fees and other taxes and levies are not included in the clearing fees. They are charged monthly. While clearing fees for the clearing and settlement of spot trades and physical deliveries from due futures positions are charged by ECC Lux, the clearing fees for clearing and settlement of futures and option trades are charged by ECC.

Further details on the current price list (as of 1 January 2011) can be found on ECC's website.

4.3 Securities settlement systems (SSS)

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.

4.3.1 Clearstream

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, Frankfurt¹² (third-party custody). For dematerialised securities, Clearstream is 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.

¹² Referred to as Clearstream unless otherwise specified.

4.3.1.1 *Types of assets and products cleared*

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 (partly via interposition of Eurex Clearing AG as the CCP) to Clearstream via appropriate IT facilities. 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).

OTC transactions can be settled FOP. 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).

4.3.1.2 *Institutional framework*

Clearstream is Germany's CSD. It received permission from BaFin to operate as 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 – 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 AG has control of both a national (Clearstream Banking AG, Frankfurt) and an international CSD (Clearstream Banking S.A. Luxembourg).

4.3.1.3 *Participation*

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 Banking Act 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.

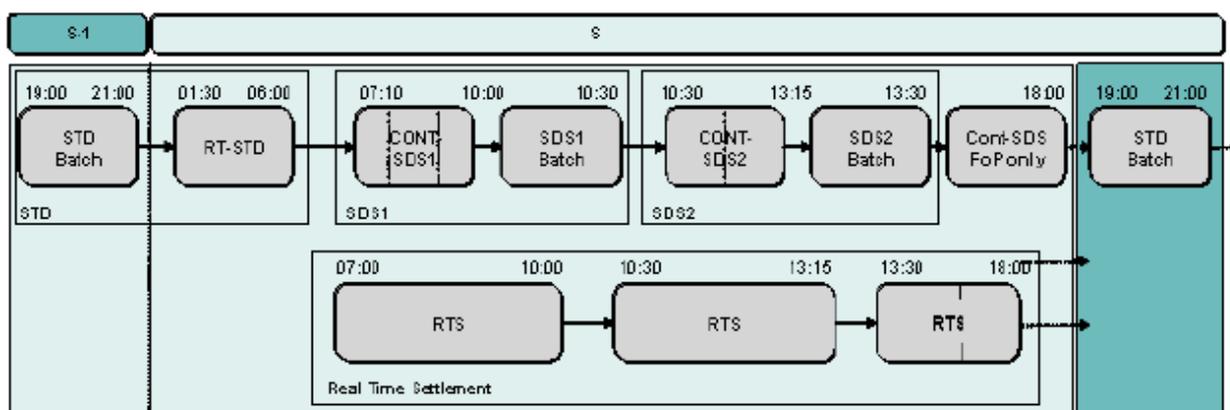
4.3.1.4 *Settlement process*

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.

At Clearstream, securities transfers against payment are generally effected only on the basis of DVP, 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 Bundesbank accounts. By adhering to the DVP principle, settlement or principal risk is avoided, ie neither of the two trading partners need unilaterally render payment or delivery in advance. If customers do not have an adequate number of securities in their custody accounts, they can utilise Clearstream's automatic securities lending facility. Cash requirements can be covered

through the usual central bank facilities, since the amounts are settled via central bank accounts.

Payments resulting from the clearing and settlement of transactions in CASCADE¹³ are settled in euros via TARGET2, thus allowing remote participants from the euro area to have access to their account (and credit line) with their home central bank. All settlement cycles supported by CASCADE are available for settlement of instructions against payment in euros. Overnight processing comprises one batch (standard settlement, STD) and one real-time settlement cycle (RT-STD). Daytime processing consists of two continuous processing cycles (CONT SDS1 and CONT SDS2) followed by a batch processing cycle (same-day settlement; SDS 1, SDS 2). In parallel, there is a real-time settlement (RTS) cycle. Basically, stock exchange trades, custody payments and the bulk of OTC trades are settled within batch runs. Alternatively, OTC transactions can be settled trade by trade on a real-time basis.



Night-time processing

Clearstream's night-time processing involves cash settlement for the CASCADE settlement cycles STD and RT-STD and is the most important settlement cycle in respect of the processed volume and value of transactions. The main feature of night-time processing is the reservation of central bank liquidity. Before the start of the STD cycle, customers participating in night-time processing must ensure that there is sufficient liquidity in their TARGET2 account. The customer must have entered his reservation order in TARGET2 by 18:30. The reservation order is executed at the start of the night processing window of TARGET2 at around 19:00, the value date being the next business day. In night-time processing, the securities and the reserved liquidity are settled simultaneously. The liquidity resulting from night-time processing is available for market participants before the opening of the TARGET2 system at 07:00.

Daytime processing

In CASCADE daytime processing consists of a first and a second same-day processing cycle. Each of the two same-day cycles is divided up into a continuous cycle followed by a batch cycle. Both cycles are independent of each other.

The processing of securities transactions takes place through the simultaneous clearing and settlement of the securities via CASCADE and of reserved central bank money provided

¹³ CASCADE is the settlement platform of Clearstream.

through TARGET2. The reservation process is identical to the one that takes place in night-time processing.

The continuous cycle for the first daytime processing (CONT SDS1) is divided up into three time windows (cycles), C1F1, C1F2 and C1F3; cash settlement for each of the processed results takes place at around 08:00, 09:00 and 10:00. The continuous cycle for the second day-time processing (CONT SDS2) is divided up into two time windows (C2F1 and C2F2), in each case at around 12:00 and 13:15. At the start of a time window customers must ensure that there is sufficient liquidity in their TARGET2 account by entering a reservation instruction.

The internal Clearstream cash settlement account mirrors the reserved and confirmed liquidity available for the settlement of securities. In the time window a securities transaction that has been validly entered and released for settlement is immediately settled through a book entry of securities in the securities accounts in CASCADE and a book entry of cash in the internal Clearstream cash settlement accounts. When the time window comes to an end, the cash balance accumulated in the internal Clearstream cash settlement account is offset against the associated TARGET2 account.

This is immediately followed by the reservation for the next time window within the processing cycle.

In the two batch processing cycles (SDS1 and SDS2), cash settlement starts through the retrospective processing of the balances through TARGET2 at around 10:15 for SDS1 and at around 13:30 for SDS2 without the necessity to reserve liquidity beforehand.

Settlement of income payments, collection payments from paying agents, fees, price difference etc, is carried out separately from securities settlement in two runs (DD1 und DD2), without the necessity to reserve liquidity beforehand. Cash settlement is then carried out after the relevant processing cycle by offsetting the cash balance against the TARGET2 account.

Real-time Settlement (RTS)

The settlement of securities transactions against payment via RTS takes place between 06:00 and 17:15. FOP transactions are possible until 18:00.

In the real-time settlement of securities transactions against payment in euros, instructions are settled individually with immediate book entry of securities and cash. The simultaneous settlement of securities and cash is achieved by first blocking the securities on the seller's side and then carrying out cash settlement through TARGET2 accounts. After positive feedback from TARGET2 to Clearstream, the blocking is withdrawn and the securities are transferred from the seller's to the buyer's account in CASCADE, bringing about final settlement. For settlement on the same day, the instructions of the buyer and the seller must be entered as matched by 16:00 and released for settlement in CASCADE. The transactions that have not been matched at 16:00 are cancelled at around 17:15 in as far as no matching has taken place.

4.3.1.5 Cash-leg settlement process

Please see section 4.3.1.4.

4.3.1.6 Custody function

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). The settlement system of Clearstream is a designated securities settlement system governed by the SFD.

4.3.1.7 Risk management

To cope with operational risks inherent to the running of a securities settlement system Clearstream has a comprehensive risk management framework composed of objectives, measures, and tools defined at the level of Clearstream and that of the Deutsche Börse Group. Clearstream's business continuity arrangements are developed at the level of the holding company and cover all sites, network control centres and business sites. At the Deutsche Börse Group level, there is a Group Risk Management (GRM) that defines the overall objectives and monitors the overall risk profile of DBG, including a comprehensive Business Continuity Management (BCM) policy, which defines the organisational roles and responsibilities, and the guiding principles to ensure operational resilience. The BCM arrangements also address the unavailability of systems, workspace or suppliers and the loss of significant numbers of staff in order to ensure the continuity of the critical operations in case of catastrophe scenarios.

The BCM policy ensures that the risk framework is implemented group-wide so that all risks are identified, centrally recorded and systemically assessed. Contingency plans and backup facilities are regularly tested with market participants and relevant parties, and maintained to ensure the resilience of Clearstream.

4.3.1.8 Links with other SSS

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. The following section outlines the major ongoing project aimed at strengthening the links with other SSS ("Link Up Markets").

4.3.1.9 Major ongoing future projects

With the objective of promoting simplified cross-border securities processing, Link Up Markets was established on 30 March 2009. Link Up Markets is a joint venture by 10 CSDs – Clearstream Banking AG Frankfurt (Germany), Cyprus Stock Exchange (Cyprus), Hellenic Exchanges S.A. (Greece), IBERCLEAR (Spain), MCDR (Egypt), Oesterreichische Kontrollbank AG (Austria), SIX SIS AG (Switzerland), STRATE (South Africa), VP SECURITIES (Denmark) and VPS (Norway). Its key objective is to improve efficiency and reduce costs of post-trade processing of cross-border securities transactions by streamlined interoperability on the CSD layer.

Link Up Markets has established a common infrastructure allowing for easy implementation of links between CSDs and introducing efficient cross-border processing capabilities. By connecting to the common infrastructure, each participating CSD has access to the services of the other participating CSDs across all available asset classes. Link Up Markets absorbs differences in communication standards across the markets, while leveraging the existing infrastructures and processes of CSDs.

In 2010 Link Up Markets finalised its initial implementation, providing all prerequisites for efficient interoperability between the current members.

Future plans are targeting three areas:

- Extending market coverage in Europe and beyond by adding new member CSDs
- Shifting functional focus away from settlement to asset servicing and enhanced services
- Leveraging existing infrastructure, eg as gateway to TARGET2-Securities

4.3.2 Use of Clearstream by the Bundesbank

Like any commercial bank, the 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 Eurosystem 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 Bundesbank's counterparties hold a pledge pool with the Bundesbank, which consists of four parts:

- (1) securities in custody accounts kept with the 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 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 Bundesbank; and
- (4) non-marketable debt instruments (credit claims) which are assigned to the Bundesbank.

In the case of Bundesbank operational safe custody accounts, Clearstream assumes the role of delivering agent, and securities are delivered FOP 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 Bundesbank assumes the daily valuation of collateral inventories according to the uniform Eurosystem criteria on its own responsibility. Clearstream has no further tasks; the 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 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 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.