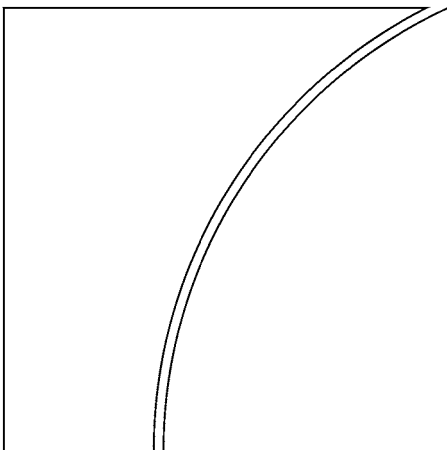


Committee on Payment and Settlement Systems



Payment, clearing and settlement systems in the CPSS countries

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Foreword

The Committee on Payment and Settlement Systems (CPSS) publishes – under the aegis of the Bank for International Settlements (BIS) – reference works on payment systems and the other financial market infrastructures in various countries, both CPSS member and non-member countries. These publications are widely known as Red Books.

Following the enlargement of the CPSS in 2009, this edition of the Red Book for the CPSS countries is in two volumes. The first volume, which covers 10 CPSS countries (Australia, Brazil, Canada, India, Korea, Mexico, Russia, Singapore, Sweden and Switzerland), was published in September 2011. This second volume covers the remaining 13 CPSS countries (Belgium, China, France, Germany, Hong Kong SAR, Italy, Japan, the Netherlands, Saudi Arabia, South Africa, Turkey, the United Kingdom and the United States) and the euro area and includes a chapter on international arrangements.

Financial market infrastructure that is resilient and effective enhances the stability of the financial system. It also reduces transaction costs in the economy, promotes the efficient use of financial resources, improves financial market liquidity and facilitates the conduct of monetary policy. I hope this new edition of the CPSS Red Book will contribute to the general understanding and awareness of these issues by providing information about arrangements in the CPSS countries.

I should like to thank all of those who contributed to the preparation of this Red Book.

Paul Tucker
Chairman
Committee on Payment and Settlement Systems

**Central bank officials involved in the preparation
of this volume of the Red Book**

National Bank of Belgium	Nikolai Boeckx Kris Bollen Patrick Ottoy Sven Siedlecki
The People's Bank of China	Li Yue Pan Song
European Central Bank	Tom Kokkola
Bank of France	Chantal Guédé Eric Michaux
Deutsche Bundesbank	Christin Knauft Beatrice Rothenburger
Hong Kong Monetary Authority	Osbert K Y Lam Vincent W S Lam
Bank of Italy	Luca Arciero
Bank of Japan	Yutaka Soejima Fusako Watanabe
Netherlands Bank	Annemarie Hondius Judith Looman
Saudi Arabian Monetary Agency	Ali Alhomidan Abdulmohsen Al-Mutairi Abdullah Humaid
South African Reserve Bank	Bashnee Rahman Mike Stocks
Central Bank of the Republic of Turkey	Erhan Akkaya Ekin Toksöz Gür İbrahim Kirdaban
Bank of England	Rachel Bracken Andrew Butcher Mubin Haroon

**Board of Governors of the Federal Reserve
System**

Mark Haley
Matthew Hayward
David Mills

Bank for International Settlements

Emma Bäcke
Can Bülent Okay

Contributions to the euro area chapter by numerous colleagues from the European Central Bank, National Bank of Belgium, Bank of France, Deutsche Bundesbank, Central Bank of Luxembourg and Netherlands Bank are gratefully acknowledged.

Contents

Foreword	iii
Central bank officials involved in the preparation of this edition of the Red Book	v
Payment, clearing and settlement systems in	
Belgium.....	1
China	23
Euro area.....	59
France	137
Germany.....	159
Hong Kong SAR	199
Italy.....	233
Japan.....	263
Netherlands	313
Saudi Arabia	345
South Africa	373
Turkey	395
United Kingdom	437
United States	471
International arrangements	509

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

Contents

List of abbreviations	5
Introduction.....	7
1. Institutional aspects	8
1.1 The general institutional framework	8
Oversight / regulatory / supervisory bodies in the field of payment, clearing and settlement.....	8
Legal framework of payment and settlement infrastructures	8
1.2 The role of the central bank	10
1.2.1 Provision of payment and settlement services	10
1.2.2 Oversight.....	10
1.2.3 Supervision.....	10
1.3 The role of other private and public sector bodies.....	10
2. Payment media used by non-banks	11
2.1 Cash payments.....	11
2.2 Non-cash payments.....	11
2.2.1 Non-cash payment instruments	11
2.2.2 Non-cash payment terminals	14
2.3 Recent developments	15
2.3.1 Internet.....	15
2.3.2 Standardisation of payment instruments.....	15
2.3.3 Security of e-payments.....	15
2.3.4 Development of e-invoicing	16
2.3.5 e-SEPA	16
2.3.6 Mobile phones as payment devices	16
3. Interbank exchange and settlements systems	16
3.1 General overview.....	16
3.2 The RTGS system: TARGET2-BE (see the descriptive Red Book chapter on the euro area)	17
3.2.1 Belgian migration to TARGET2.....	17
3.2.2 Participation in the system.....	17
3.2.3 Ancillary systems settling through TARGET2-BE.....	17
3.3 The retail payment system: CEC	17
3.3.1 Operating rules.....	17
3.3.2 Participation in the system.....	17
3.3.3 Types of transaction handled.....	17
3.3.4 Daily operation of the system.....	18

3.3.5 Settlement procedures.....	18
3.3.6 Pricing	19
4. Systems for post-trade processing, clearing and securities settlement	19
4.1 General overview.....	19
4.2 Central counterparties and clearing systems	19
4.3 Securities settlement systems.....	19
General legal framework.....	19
4.3.1 NBB-SSS.....	20
4.3.2 Euroclear Belgium	22
4.4 Use of securities infrastructure by the central bank.....	22

List of abbreviations

ACH	Automated Clearing House
BCC	Bank Card Company
CBFA	Banking, Finance and Insurance Commission – Commission bancaire, financière et des Assurances (CBFA) / Commissie voor het Bank, Financie- en Assurantiewezen (CBFA)
CEC	Centre for Exchange and Clearing – Centre d’Echange et de Compensation (CEC) / Uitwisselingscentrum en Verrekening (UCV)
CVH – TCE – CPCB	Centralised processing of commercial bills – Centrale Verwerking Handelspapier / Traitement Centralisé d’Effets de Commerce
FSMA	Financial Services and Markets Authority – formerly CBFA
ICSD	International Central Securities Depository
NBB	National Bank of Belgium – Banque Nationale de Belgique (BNB) / Nationale Bank van België (NBB)
POS	Point of sale
PPS	Protected payment system
SCT	SEPA Credit Transfer
SDD	SEPA Direct Debit
SEPA	Single Euro Payments Area
TARGET2-BE	The TARGET2 component system of the National Bank of Belgium

Introduction

A number of payment and securities settlement systems are located in Belgium. The National Bank of Belgium (NBB) is involved in the provision of payment and settlement services; ie it manages the interbank settlement systems Centre for Exchange and Clearing (CEC) and TARGET2-BE (the national RTGS system for large-value payments (formerly ELLIPS)).¹ The NBB also operates the NBB-SSS for dematerialised government and corporate bonds.

The NBB oversees, or takes part in, international cooperative oversight arrangements for the following systems:

- SWIFT;
- the securities settlement systems Euroclear Bank, Euroclear SA/NV, Euroclear Belgium, and NBB-SSS;
- the central counterparty LCH.Clearnet;
- the card payment schemes Atos Worldline and Mastercard Europe; and
- the payment systems CEC, TARGET2, and CLS.

Since 1 April 2011, the NBB has been responsible for the prudential supervision of Euroclear Bank, Euroclear SA/NV, and payment institutions (including providers of mobile payments and Atos Wordline).

Payment and securities settlement systems, payment service providers or payment instruments are governed mainly by specific legislation or regulations, most of which implement EU directives.

Following on from the widespread use of credit transfers, direct debits and card payments, internet banking and mobile payments are becoming increasingly popular, as are new electronic payments methods, such as electronic bill presentation and payment. E-invoicing, or the electronic exchange of invoices between businesses and their customers, is also helping to drive the development of electronic payments.

Belgian bank customers have been able to use the Single Euro Payments Area (SEPA) Direct Debit instrument since November 2009, and they also have access to the SEPA Cards Framework. The SEPA instruments allow customers to use standardised payment instruments for payments throughout the SEPA area, making international payments as efficient and easy as domestic ones.

Three different securities settlement systems are established in Belgium: NBB-SSS (for government and corporate bonds), Euroclear Belgium (formerly CIK, see the descriptive Red Book chapter on the euro area) and the ICSD Euroclear Bank (see the descriptive Red Book chapter on the euro area). Euroclear Bank and Euroclear Belgium are part of the Euroclear Group that also includes the CSDs of France (Euroclear France), the Netherlands (Euroclear Nederland), the UK (Euroclear UK & Ireland), Sweden (Euroclear Sweden) and Finland (Euroclear Finland). Following the restructuring of the Euroclear Group in 2005, Euroclear SA/NV, a financial holding company established in Belgium, has become the parent company of the Euroclear Group (I)CSDs providing common services to the group entities. In 2009, the ESES platform was launched integrating the settlement activity of the securities settlement systems of Euroclear Belgium, Euroclear France and Euroclear Nederland (see the descriptive Red Book chapter on the euro area).

¹ ELLIPS was replaced by the Belgian component of TARGET2 in February 2008.

1. Institutional aspects

1.1 The general institutional framework

Oversight / regulatory / supervisory bodies in the field of payment, clearing and settlement

The NBB is responsible for the oversight of payment and securities settlement systems pursuant to Article 8 of the Organic Law of 1998 that established the NBB as a member of the ESCB.

Since 1 April 2011, the NBB has also been the prudential supervisor of electronic money institutions, settlement institutions (organismes de liquidation / vereffeninginstellingen), clearing institutions (organismes de compensation / verrekeningsinstellingen) and of payment institutions pursuant to the new Articles 12*bis* and 36 Section 2 of the NBB Organic Law.

The FSMA is the market authority for settlement and clearing institutions and is responsible for monitoring and approving their operating rules.

Legal framework of payment and settlement infrastructures

Payment and securities settlement systems, payment service providers or payment instruments are governed mainly by specific legislation or regulations, which are often implementations of EU directives. The following legislation is generally applicable to payment and settlement infrastructures and payment service providers:

- The Law on the legal status and supervision of credit institutions (22 March 1993), which aims to protect the savings of the public and to safeguard the smooth functioning of the credit system by laying down rules for the establishment and the operation of the credit institutions as well as for the supervision of the latter. Furthermore, the Law on the legal status and supervision of credit institutions contains a chapter on netting between most financial institutions. The law seeks to guarantee the legal certainty of offsetting agreements for debts between two or more credit institutions, where one of these institutions is involved in bankruptcy or in any other case involving concurrent claims governed by Belgian law.
- Explicit recognition is given, through Article 157 of the Law on the legal status and supervision of credit institutions, to the legal validity of bilateral or multilateral offsetting agreements for claims between credit institutions themselves and between credit institutions and a clearing house, as well as to “close-out” agreements (express termination clauses in the event of bankruptcy or other default situations). These agreements are legally binding and enforceable against third parties (including a liquidator), subject to the conditions defined in this provision. In particular, it is clear that the claims to be offset no longer need to be related.
- The Law on the legal status and supervision of credit institutions (22 March 1993) also contains provisions related to electronic money and the prudential supervision of electronic money institutions. These provisions will remain in force until the new Electronic Money Directive 2009/110/CE is transposed into Belgian law in the course of 2011. The provisions of this new directive will be inserted into a new chapter in Belgian law that regulates the prudential supervision of payment institutions.
- The law relating to the supervision of payment institutions, to the access to the activity of payment service provider and to the access to payment systems (21 December 2009). This law transposes mainly Title II (prudential supervision of payment institutions) of the Payments Services Directive (PSD) into Belgian law.

- The Law on the settlement finality of payments (law on “settlement finality”, 28 April 1999) which implements Directive 98/26/EC and protects the finality of transfer orders and of netting in payment and securities settlement systems. Moreover, Article 9 of this law goes beyond the directive in stating that cash settlement accounts held with an operator or a settlement agent of a securities settlement system may not be blocked by a participant (other than the operator or the settlement agent of the system), a counterparty or a third party.
- Article 8 of the Organic Law of the NBB (22 February 1998), which entrusts the NBB with supervisory powers over clearing, payment and securities settlement systems (see Section 1.2).

The following legislation applies to securities settlement systems:

- (i) The various statutes constituting the Belgian securities legal regime, ie the Laws of 2 January 1991 and 22 July 1991 and Articles 468 and following of the Belgian Company Code for dematerialised securities and the coordinated Royal Decree no 62 for fungible securities. These legislations contain essential provisions ensuring asset protection and access to the securities in case of insolvency of the intermediary (revindication rights).
- (ii) Article 9 of the Law of 28 April 1999 on settlement finality, Article 10 and 12bis of the Law of 2 January 1991, Article 11 of the co-ordinated Royal Decree no 62 and Article 472 of the Belgian Company Code provide for the prohibition of upper tier attachment.
- (iii) The legislation contains a specific prohibition against the use by depositaries of their customers’ assets for own-account transactions (Article 5 of the Law of 2 January 1991 and Article 148 Section 3 of the Law of 6 April 1995) and Article 77 of the Law of 6 April 1995 imposes segregation and identification requirements on credit institutions and stock brokers (beursvennootschappen / sociétés de bourse) established in Belgium.

Regarding payment systems and payment instruments and services, the following legislation is also relevant:

The Law of 10 December 2009 relating to payment services, which transposes Titles I, III, IV and V of the EU Payment Services Directive into Belgian law. This law contains provisions concerning payment services carried out in Belgium (transparency of conditions and information requirements, rights and obligations of payment service providers and payment service users in relation to payment services). The Law of 22 December 2009 modifying the Law of 2 August 2002 also contains provisions relating to infringements to the law on payment services.

The Law of 21 December 2009 also contains rules relating to:

- the types of entity that may provide payment services in Belgium (Article 5, which transposes Article 1 of the PSD);
- access to payment systems in Belgium (Article 49, which transposes Article 28 of the PSD). Most payment instruments used in Belgium are regulated by the provisions of the Law of 10 December 2009 on payment services. Some payment instruments outside its scope are regulated by a specific law (see for example the Law on cheques of 1 March 1961);
- Regulation 924/2009 on cross-border payments in the European Community – which obliges payment service providers to charge the same price for cross-border payments in euros up to EUR 50,000 as for corresponding euro-denominated national payments; and
- Regulation 1781/2006 on information on the payer accompanying transfers of funds.

In addition to this legislation, relations between payment service providers, consumers and retailers are governed mainly by contractual agreements.

1.2 The role of the central bank

1.2.1 Provision of payment and settlement services

The NBB is closely involved in the Belgian interbank clearing mechanisms: it runs and manages the CEC (an ACH for retail payments) and TARGET2-BE (the Belgian component of the TARGET2 RTGS system). Furthermore, the NBB also operates the NBB-SSS for dematerialised government and corporate bonds.

1.2.2 Oversight

In accordance with Article 8 of its Organic Law of February 1998, the NBB is in charge of the oversight that ensures the efficient and sound operation of clearing and payment systems. Article 23 Section 3 of the Law of 2 August 2002 reaffirms the legal basis for NBB's oversight of securities settlement systems.

The NBB oversees or takes part in international cooperative oversight arrangements for the following systems:

- the securities settlement systems (and associated institutions): Euroclear Bank, Euroclear SA/NV, Euroclear Belgium, NBB-SSS;
- CCP: LCH.Clearnet SA;
- card payment schemes: Atos Worldline, Mastercard Europe; and
- payment systems: CEC, TARGET2 and CLS.

For SWIFT a cooperative oversight arrangement exists among the central bank overseers of the G10 and the ECB in which the NBB acts as leading overseer of SWIFT (see the descriptive Red Book chapter on international payment arrangements).

1.2.3 Supervision

With effect from 1 April 2011, the NBB is responsible for prudential supervision of credit institutions, including electronic money institutions, investment firms with the status of stock market investment firms, insurance companies, reinsurance companies, mutual guarantee companies, clearing agencies, settlement agencies and agencies similar to settlement agencies and payment institutions. The new Financial Services and Markets Authority (FSMA), formerly the Belgian Banking Finance and Insurance Commission (CBFA), has responsibility for financial market supervision and consumer protection. This "Twin Peaks" model was established by the Belgian Law of 2 July 2010.

The NBB is also responsible for the prudential supervision of Euroclear Bank, Euroclear SA/NV and payment institutions (including providers of mobile payments and Atos Wordline).

1.3 The role of other private and public sector bodies

Other private and public sector bodies in the field of payment and securities systems are:

- The new Financial Services and Markets Authority (FSMA), formerly the Belgian Banking Finance and Insurance Commission (CBFA) which has responsibility for financial market supervision and consumer protection. As of 1 May 2012, the FSMA took over the responsibilities of the Securities Regulation Fund (SRF) for the supervision of account administration for dematerialised public debt securities.

- The Belgian Bankers' Association, Febelfin. A professional organisation that aims to promote its members' professional interests, mainly through economic research, financial, legal and technical advice, and training.
- ISABEL, a provider of financial infrastructure solutions and services for consumers, businesses and banks. ISABEL was established by a consortium of banks to develop a secure electronic network for banking transactions that also allows business users to send and receive invoices and submit documents to government departments.
- Atos Worldline, a company which operates, inter alia, the national ATMs, the POS network, and the electronic purse scheme PROTON.
- The Brand and Licensing Company (BLC), which owns and operates the Belgian Bancontact/MisterCash scheme.

2. Payment media used by non-banks

2.1 Cash payments

Cash comprises banknotes in denominations of EUR 5, 10, 20, 50, 100, 200, 500 and coins in denominations of EUR 0.01, 0.02, 0.05, 0.10, 0.20, 0.50, 1 and 2. Data on banknote and coin issue outstanding are only available for the euro area in aggregate.

The issue of coins is legally restricted to EUR 1.4 billion (in 2010). Coins are legal tender only up to a specified maximum, which varies for each denomination.

2.2 Non-cash payments

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

There is no statutory definition of current accounts. According to the regulation governing the monthly financial data that banks submit to the NBB, current accounts are those on which deposited money can be immediately withdrawn.

Royal Decree no 56 of 10 November 1967 obliges businesses to hold an account to which credit transfers can be made by their customers. These are generally current accounts.

To conform with European legislation, Directive 2007/64/CE (the Payment Services Directive) has been transposed into Belgian law. Thus, the execution times for retail payments in Belgium now follow the European harmonised rules.

2.2.1 Non-cash payment instruments

2.2.1.1 Credit transfers

Credit transfers are a widely used payment instrument and account for about 40% of all retail payments (as of 2009). Customers making a payment instruct their banks either on paper – submitted or posted to a branch – or via an electronic channel (such as self-service banking, telephone and internet banking, magnetic or digital media).

A significant development can be seen in the growing popularity of self-service banking, internet banking, and home banking products and channels. More and more firms are sending their payment orders to banks via electronic channels. The 2009 data show that customers sent about 90% of all credit transfer instructions to banks in paperless form.

2.2.1.2 Direct debits

The Belgian direct debit scheme was set up in 1980. Its purpose, like that of standing orders, is to simplify the execution of regular payments. Direct debits are used mainly to pay utility bills, and account for about 12% of all retail payments (as of 2009).

A direct debit payment arrangement is based on a contract (the mandate) by which payers (i) authorise the payee to initiate the collection and (ii) instruct their payment service provider to debit their accounts for specified claims. From November 2009, the SEPA Direct Debit scheme has been available to all users. Creditors are responsible for migrating from the legacy Belgian system to the SEPA Direct Debit scheme. The SEPA Business-to-Business Direct Debit scheme appears to be reasonably popular, but the migration towards the Core scheme – in which the debited party is a consumer – has been slow (as of early 2012).

2.2.1.3 Cheques

The use of cheques issued by individual credit institutions and postal cheques has been falling by an annual average of 10% since 1995. Cheque payments currently account for less than 1% of total retail payments. This reflects the increasing use of debit and credit cards. Furthermore, the phasing out of the eurocheque and its guarantee at the end of 2001 has accelerated the decline in cheque usage. Most banks no longer provide their clients with chequebooks.

2.2.1.4 Payment cards

Payment cards are the most commonly used means of payment in Belgium. As of 2009, payment cards account for about 44% of all retail payments.

Debit cards

Debit cards, issued by the credit institutions under their own logo together with that of the Bancontact/Mister Cash scheme, can be used at ATM and POS terminals. The debit card function is generally combined with an e-money facility. Such hybrid cards have both an EMV chip and a magnetic stripe (the latter mainly to support the Maestro function in non-EMV countries). The EMV chip supports the use of a PIN for POS payments, cash withdrawals at ATMs, loading an e-purse and other transactions that depend on a PIN code. It is also used for offline operations (eg e-money payments).

Atos Worldline is the major card acquirer in Belgium (next to Europabank and Citibank). Categorised as a payment institution, it manages the ATM-POS network and monitors bank-issued cards and PIN mailer production for the bank cards of most card-issuing banks. Atos Worldline participates indirectly in the ACH CEC (see Section 3.3) and exchanges all ATM and POS operations to be cleared in this system.

Payment procedures are automated in most cases. At the point of sale, authorisation takes place online and details of the transaction are immediately recorded by the issuing bank's computer system.

Debit card users pay an annual fee, which is generally included in the overall charge for current account and other banking services. A small minority of retail outlets charge for POS transactions.

Over the last few years, the use of debit cards has gradually become internationalised. Holders of Atos Worldline cards also have access to ATMs and POS terminals in most European countries, as most debit cards are co-branded with an international scheme such as Maestro or VPay.

Delayed debit cards/credit cards

Delayed debit cards and credit cards (American Express, Diners Club, Mastercard and Visa) are widely accepted in Belgium, where Mastercard holds the largest market share.

Atos Worldline distributes the majority of Visa and Mastercard cards and operates transaction authorisation and processing for these cards.

The liability provisions in case of the loss or theft of a payment card are set out in the Law of 10 December 2009, which transposes Directive 2007/64 into Belgian law.

2.2.1.5 Electronic money

There is no software-based electronic money in Belgium. A multipurpose prepaid card scheme, PROTON, was launched by Atos Worldline in February 1995.

PROTON is a smart card that stores e-money as opposed to tokens or units of service (as a phone card does). It is designed for low-value amounts as a substitute for cash (and small-value cheques) and is typically used to make payments of less than EUR 13 at local retail outlets, vending machines, car parks, ticket machines, payphones and on public transport. It can be loaded with amounts ranging from EUR 5 to EUR 125. Card-to-card payments are not possible.

PROTON is a euro-only system. Card loading and balance enquiries are PIN-protected. The cards can be reloaded at ATMs or at public telephone booths. A smart phone that allows users to reload their cards at home and use them to make payments over the telephone has also been available since the end of 1997.

During a transaction, money is transferred from the PROTON card to the retailer's offline terminal or vending machine. As only small amounts are involved, and for the sake of speed and convenience, these payments are made without PIN protection. The retailer can transfer the money to its bank account simply by making a transfer from its terminal. Cardholders can check the balance on their PROTON card at an ATM, public telephone booth, retailer's terminal or by means of a small personal card reader.

Electronic purses are issued only by credit institutions. Each institution sets the fees (if any) it charges to cardholders. Using or loading the cards must remain free of charge. Atos Worldline is responsible for the tariff policy applied to the retailers. The retailers have to pay a percentage of the amount stored in their terminals plus a fixed fee (depending on the contract) per collection. Although the PROTON technology has been adopted by a number of other countries, its popularity is gradually waning in Belgium, with transaction volumes roughly halving between 2004 and 2009. Meanwhile, banks and mobile phone operators are seeking a replacement for the technology.

Single purpose cards

Some large retailers (petrol companies, retail stores etc) issue single purpose cards for exclusive use in their own outlets or networks. In some cases, however, these transactions are processed via the Atos Worldline network.

2.2.1.6 Postal instruments

Offered by the Belgian Post, the Inpayment transfer is a hybrid payment instrument that allows a payment to be made to any holder of a (bank or postal) current account on the basis of cash paid in at any post office counter. The service allows customers without current accounts to make payments to account holders.

The Post issues a special category of cheque, known as the postal draft. This is a payment order, sent by post, that the recipient can cash in at a post office. This instrument enables a payment to be made to payees who have no current account or whose current account number is unknown to the payer. The draft is drawn on a postal current account. Government

agencies used to make extensive use of the postal draft system to pay social security benefits (eg pensions, family allowances), but such drafts are now gradually being replaced by ordinary credit transfers.

2.2.1.7 Commercial bills

Since the end of 1997 the system for the Centralised Processing of Commercial Bills (CPCB), operated and managed by the NBB, has eliminated the physical circulation of commercial bills between banks, replacing it with an automated exchange of data through the CEC retail payment system. To this end, the CPCB system automatically centralises, retains and presents all commercial bills domiciled at financial institutions for cash processing. In the case of non-payment, the CPCB system acts as the authorised central depository for protested bills. It is responsible for publishing a monthly list of protested bills that is sent each month to the registries of the Trade Tribunals. The CPCB system also ensures the distribution to third parties of information concerning published protests.

The use of commercial bills and similar instruments is generally on the decline. Indeed, volumes have fallen so far in recent years that the NBB discontinued centralised processing of commercial bills in September 2011. Commercial bills are now exchanged and settled according to bilateral agreements.

2.2.1.8 Other payment instruments

Other payment instruments used in Belgium include:

- Lunch Pass, Eco Pass, Cadeau Pass:

These are vouchers issued by companies such as the catering firms Sodexo and Edenred to companies that distribute them to employees as part of their remuneration. Lunch Passes may only be used for the payment of a restaurant bill or for the purchase of food products. Eco Passes are designed to promote the purchase of ecologically sound consumer products, while Cadeau Passes are often handed out on special occasions such as Christmas or New Year. Some new players in this market have plans to launch luncheon vouchers in electronic form.

- Service Passes:

These passes are issued by Sodexo as part of a campaign by the public authorities to clamp down on the unofficial economy. Users can claim a tax benefit when using this instrument to pay for domestic help, cleaning services etc.

2.2.2 Non-cash payment terminals

POS network

Atos Worldline manages the POS network and online terminals for the card-issuing credit institutions that comprise its shareholders. Transactions via these terminals are protected by chip-based cards and PIN codes.

Each transaction initiates a series of real-time checks, as follows:

- blacklist of card reported stolen etc;
- balance on the current account, either on the basis of the balance at the previous day's close, taking into account the total of the operations effected on that day by means of the card, or on the basis of the actual balance (depending on the card holder's institution); and
- upper limit of daily and weekly transactions caps (mostly set by the customers themselves).

The online authorisation procedure is designed to prevent fraud and unauthorised overdrafts.

POS terminals at petrol stations and large retail outlets are linked via leased lines to the network's computer centres, while those installed at small retail outlets and in other sectors are linked in via ordinary telephone lines.

The interbank network can be accessed not only with bank debit cards but also with credit cards and a range of proprietary cards issued mainly by petrol companies for use only at their petrol stations. These companies make use of the interbank network infrastructure, but offer additional inducements such as discounts, the possibility of using the card abroad etc. These services are aimed at vehicle fleet operators.

ATM networks

Atos Worldline manages the ATM network and terminals online on behalf of the card-issuing credit institutions. ATMs are used mainly for cash withdrawals and are accessed with chip cards and PIN codes.

ATMs allow cash withdrawals, current account balance enquiries, PIN code changes and the loading of PROTON cards. Each transaction initiates various real-time security checks (see the section on POS network above).

In early 2006, the major credit institutions agreed to allow their ATMs to be used by customers of other banks, thus broadening the range of ATMs available to the typical bank customer. Typically, these ATMs provide a cash withdrawal service for all card holders, but other types of transaction, such as initiating credit transfers, transfers from current accounts to savings accounts, printing account statements etc, may be restricted to customers of the bank that operates the ATM.

2.3 Recent developments

2.3.1 Internet

Telephone and, in particular, internet banking are becoming increasingly popular. All banks offer internet banking services that allow users to initiate credit transfers, standing orders and balance enquiries, as well as manage their investments.

Online payments, authenticated by a regular debit or credit card in combination with the authorisation checks of an internet banking application, are becoming widespread. Various new projects are under way in this field with some major developments expected in the next few years.

2.3.2 Standardisation of payment instruments

Efforts continue to standardise payment instruments for automated processing. Under way since 2008, the SEPA project has paved the way for Europe-wide standardisation of payment instruments, including credit transfers, direct debits and card payments. The NBB participates in several related working groups set up by the Belgian Bankers' Association.

Payment methods which still rely on the actual presentation of instruments (as in most types of cheque transaction) are being progressively replaced by automated methods (eg based on scanned documents and automated settlement). The Belgian banking community, in cooperation with the NBB, is one of the European front-runners in the migration towards the SEPA standards.

2.3.3 Security of e-payments

Atos Worldline already offers the option of paying with a card via the internet by means of a plug-in terminal for personal computers (see Section 2.2.1). Working in close cooperation with the credit card companies, Atos Worldline accepts several different types of hardware

for the authentication of online transactions and is now working on an application which will allow end-to-end secure electronic transactions (SETs) from the customer to the supplier via the Atos Worldline infrastructure. This technology is known as 3-D Secure (Visa) or SecureCode (Mastercard).

2.3.4 Development of e-invoicing

ISABEL, a provider of financial infrastructure solutions and services for consumers, businesses and banks, has rolled out the Zoomit e-invoicing tool, by which creditors can send electronic invoices directly to their customers' PC-banking applications. The payment data are then automatically compiled, so that the payer only has to approve the payment.

Zoomit electronic invoices can be received by most Belgian banks, and a growing number of creditors are relying on this paperless invoicing channel. The payer receives an e-mail notification, from which the payment of the invoice can be easily authorised. Payment security is assured by the authorisation system of the payer's internet banking application.

2.3.5 e-SEPA

The Belgian banking community is following market developments in the field of e-SEPA, which will be based on European standards and will further automate payment processes.

2.3.6 Mobile phones as payment devices

New services such as m-banxafe (offered by Atos Worldline) link the payment card to a mobile phone, thus allowing users to reload prepaid cards for mobile phones, check account balances and generate payments.

Belgacom, Belgium's largest telecom company, offers the PingPing system for mobile payments, which can be used for small payments (of up to EUR 25) as well as for payments via SMS message (which are used mainly to pay for parking and public transport).

At the beginning of 2011, the Belgian banking community and the three mobile phone operators active in the country announced that they would work together on a new standardised mobile payment solution.

3. Interbank exchange and settlements systems

3.1 General overview

Two domestic interbank payment systems are operated by the central bank in Belgium: TARGET2-BE and the CEC. TARGET2-BE is the Belgian RTGS system component of TARGET2 designed to process large-value credit transfers. The CEC is the Belgian ACH for retail payments, handling both credit and debit orders.

These systems are the pillars of the interbank payments system in Belgium. Together they process more than 99.5% of interbank payments (99.4% of total value). Both systems operate solely in euros.

3.2 The RTGS system: TARGET2-BE (see the descriptive Red Book chapter on the euro area)

3.2.1 Belgian migration to TARGET2

On 18 February 2008, the Belgian banking community switched to the TARGET2 single shared platform. As a result, the former Belgian real-time gross settlement system, ELLIPS, was shut down on 15 February 2008.

In addition to the mandatory payments module, TARGET2-BE also provides access to the optional reserve management module and standing facilities module.

3.2.2 Participation in the system

The National Bank of Belgium is the operator of TARGET2-BE and has a contractual relationship with the banks that participate directly in TARGET2 and thus remains their counterparty in all matters concerning TARGET2.

The NBB provides a TARGET2-BE helpdesk and a secured website for the TARGET2 user community. A Belgian user group meets regularly to discuss TARGET2 topics and developments.

3.2.3 Ancillary systems settling through TARGET2-BE

The following ancillary systems are linked to the NBB and TARGET2-BE for settlement services: Euroclear Belgium, NBB-SSS (see Chapter 4), OVP (“Openbare Verkoop-Vente Publique” for physical securities on Euronext) and the retail payment system CEC (see Chapter 3.3).

3.3 The retail payment system: CEC

3.3.1 Operating rules

The CEC is a non-profit-making organisation set up in 1974 by the banking sector. Its members are the major banks located in Belgium, and the Post. At board level, NBB acts as a neutral chair without voting power but the central bank has a right of veto if the board were to consider taking a decision that would be prejudicial to NBB’s interests or public duties. Under a contractual regime, NBB is responsible for the day-to-day management of the CEC’s operations.

3.3.2 Participation in the system

According to the CEC’s statutes, all credit institutions and payment institutions legally entitled to operate in Belgium as well as the Post and the NBB may make use of the CEC’s services. Payment institutions may only participate as indirect participants, through another participant. Direct participants must fulfil set operational, technical and legal criteria.

All large and medium-sized banks active in Belgium participate directly in the CEC, while smaller and niche banks are connected indirectly via a direct participant.

3.3.3 Types of transaction handled

The CEC is used for retail payments. Its operations are categorised into credit transfers (of up to EUR 500,000); direct debits; ATM/POS transactions; operations related to e-money; and truncated cheques for up to EUR 50,000 and bills of exchange. Scanned images of large-value cheques (of EUR 50,000–25 million) are sent over an electronic data exchange platform run by an independent service provider.

3.3.4 Daily operation of the system

The exchange of payments is continuous, 24 hours a day, except for 15 minutes at the daily clearing session (15:00–15:15) when the system establishes the netted end-of-day positions for all participants and does not send out bulk payment messages (although participants can continue sending payments to the system during this period).

The system operates non-stop from Monday 00:00 until Friday 20:00. On Saturdays and some bank holidays the system is open from 09:00 until 17:00. These opening hours allow card operators to send in POS- and ATM-related transactions immediately instead of queuing them until Monday morning.

Cut-off times differ per payment instrument and are spread over the day. The timetable is as follows:

CEC time schedule for settlement on T+0	
Operations	Cut-off times
Direct debits and unpaid direct debits	10:30
Credit transfers	13:30
Bills of exchange	13:30
Cheques and unpaid cheques	14:15
Higher-value ¹ or urgent and SEPA credit transfers	15:00
Daily cut-off	15:15

¹ Value between EUR 125,000 and EUR 500,000

At the daily cut-off, clearing is performed in the system and multilateral net settlement positions are sent to the TARGET2 single shared platform.

This means, for example, that credit transfers exchanged from 13:30 on day T until 13:30 on day T+1 are settled at 15:00 on day T+1. Credit transfers exchanged from 13:30 on day T–1 until 13:30 on day T are settled at 15:00 on day T. The settlement of the data exchanged after these deadlines takes place on the next value date.

There is no exchange of paper payment documents as these are retained by the institution that receives them from the customer. Participants receive real-time electronic updates on their settlement positions throughout the day.

Data are transferred electronically to the CEC. In case of serious technical problems or disconnection, participants can move to NBB premises to continue operations using a standby user interface. Other contingency facilities exist both within NBB's head office and in an external backup centre, so that operations can be resumed within two hours even in a worst-case scenario.

3.3.5 Settlement procedures

CEC balances are settled on a net and multilateral basis. The amounts to be cleared are calculated for each member and settled on a settlement account on the TARGET2 shared single platform. This account can be either the member's own settlement account if the member is a TARGET2 settlement bank or the settlement account of another TARGET2 settlement bank. All exchanged payments are settled on the same day, provided they have been remitted before the cut-off time.

3.3.6 Pricing

The NBB operates the CEC on a full-cost recovery basis: all CEC operating costs are recovered from the members. The members share the costs of the CEC system on the basis of transaction volumes. Direct participants pay a joining fee of EUR 200,000 and indirect participants one of EUR 30,000.

4. Systems for post-trade processing, clearing and securities settlement

4.1 General overview

Several securities settlement systems are located in Belgium: (i) NBB-SSS for dematerialised government securities, commercial paper and certificates of deposit as well as dematerialised or fungible corporate bonds; (ii) Euroclear Belgium (formerly CIK), a member of the Euroclear group, for equities, corporate bonds and funds; and (iii) the international depository Euroclear Bank, operator of the Euroclear system (see the descriptive Red Book chapter on international payment agreements). On the clearing side, LCH.Clearnet SA also has a Belgian branch.

4.2 Central counterparties and clearing systems

BXS-Clearing, which used to clear transactions for Euronext Brussels, merged with the other clearing houses of the Euronext exchanges in January 2001 to become a branch of LCH.Clearnet SA. The NBB takes part in the regulatory colleges (CCC and JRA) set up for the coordinated regulation, supervision and oversight of the clearing activities of LCH.Clearnet SA that are related to the Euronext markets. This supervisory activity is coordinated by a permanent secretariat currently located at the Bank of France. It should be noted that the clearing rules require the prior approval of the Belgian Minister for Finance. (For more information about LCH.Clearnet SA, see the descriptive Red Book chapter on the euro area).

4.3 Securities settlement systems

General legal framework

Book-entry securities can be held in Belgium under two legal regimes: either full dematerialisation or fungibility, ie when bearer or registered securities still exist. Dematerialised securities are governed by the Laws of 2 January 1991 and 22 July 1991, Article 468 and following of the Belgian Companies Code and the coordinated Royal Decree no 62, whereas fungible securities are governed by the coordinated Royal Decree no 62.

The finality of settlement of securities transactions is clearly and effectively guaranteed in Belgium by Article 157 of the Law of 22 March 1993 and the Law of 28 April 1999 on settlement finality. Euroclear Bank, Euroclear Belgium (formerly CIK) and NBB-SSS are the SSS designated under the EU Settlement Finality Directive (98/26/EC of 19 May 1998) and the Law of 28 April 1999 implementing that directive.

The holding of customers' securities is protected under Belgian law against the insolvency of custodians and intermediaries by the following legislation:

- the law contains a specific prohibition against the use by depositaries of their customers' assets for own-account transactions (Article 5 of the Law of 2 January 1991 and Article 148 Section 3 of the Law of 6 April 1995).

- if a depository becomes insolvent, the customers can claim their securities against their insolvent depository (Article 8 of the Law of 2 January 1991, Articles 12–13 of the co-ordinated Royal Decree no 62, Article 471 of the Belgian Companies Code). The securities of customers do not form part of the insolvent depository's estate and the liquidator can not exercise claims on them. If the total amount of clients' securities are insufficient to meet the claims of all customers, the latter have recourse against the own securities of their insolvent depository, if it was holding securities for its own account. In doing so, they will have priority over the general bankrupt estate.
- if the depository is holding securities of a customer with another depository, either in its own name or in the name of a third party, the depositor/owner can revindicate those securities against the other depository (Article 9 of the Law of 2 January 1991, Article 13 of the co-ordinated Royal Decree no 62, Article 471 of the Belgian Companies Code).
- both the securities (and rights to such securities) and the cash accounts held in the books of SSS are immune against attachment (Article 9 of the Law of 28 April 1999 on settlement finality, Article 10 and 12bis of the Law of 2 January 1991 and Article 11 of the co-ordinated Royal Decree no 62, Article 472 of the Belgian Companies Code).
- Article 77 of the Law of 6 April 1995 imposes segregation and identification requirements on credit institutions and stockbrokers (beursvennootschappen/sociétés de bourse) established in Belgium. Also, these institutions should make sure that similar procedures are in place at the level of their intermediary in case of a sub-deposit of financial instruments (Article 66 of the Royal Decree of 3 June 2007 implementing the MIFID directive). The reason for this segregation is that it facilitates the above-mentioned revindications and the supervision of the custody activity. Foreign participants have to apply the asset protection rules of their home member state.

For all these reasons, customers' assets are adequately protected under Belgian law, particularly against the insolvency of custodians and intermediaries.

4.3.1 NBB-SSS

4.3.1.1 Institutional framework

NBB-SSS was created by the Law of 2 January 1991 on the market for government debt and monetary policy instruments. This legislation brought into being an active secondary market in government debt securities. Its product scope was extended by the Law of 22 July 1991 on commercial paper. NBB-SSS is the Central Securities Depository (CSD) for government securities and dematerialised fixed income securities in Belgium and enables the book-entry transfer of such securities between the system's participants. As to the corporate bonds referred to in Article 485 of the Companies Code, the National Bank, pursuant to the Royal Decree of 12 January 2006 (Art. 6), was designated, together with Euroclear Belgium (formerly CIK), as the settlement body.

Owners of securities held on account with the NBB-CSD/SSS have a co-ownership right to a notional pool of securities. According to the Law of 2 January 1991, the owners of dematerialised public debt securities and dematerialised commercial paper have a special right to recover the securities they own (right of revindication) in the case of insolvency of a participant or sub-participant of the NBB-SSS. The book-entry securities held on such a system do not form part of the estate of the depository and the liquidator cannot exercise claims on them.

The coordinated Royal Decree 62 and the Company Code provide owners of, respectively, fungible securities and dematerialised corporate bonds held on account with the NBB-SSS with a similar right. Such a right also exists in the hypothetical event of the insolvency of the NBB-SSS. Settlement finality in the NBB-SSS is clearly and effectively guaranteed by Belgian law. The NBB-SSS has been officially designated as a system under the Settlement Finality Law (see *General legal framework* above).

The Law of 6 August 1993, governing transactions on certain securities, introduces a specific tax system for fixed income securities deposited in a settlement system; it also makes the Treasury responsible for the collection and payment of the withholding tax due from certain beneficiaries of securities income.

As of 1 May 2012, the FSMA is responsible for the supervision of account administration for dematerialised public debt securities.

4.3.1.2 Participation

The NBB-SSS's direct participants (its only membership category) include credit institutions established in the EU, stockbroking firms established in the EU, the Treasury administration, the NBB, Clearstream Luxembourg, Euroclear Bank, and other CSDs and CCPs.

Each participant joining the system has different accounts for the securities held on its own account, those held on behalf of third parties and those pledged as collateral.

4.3.1.3 Types of transactions

The system enables the processing of transactions on both the primary and the secondary market (including buy/sell, repo and Euronext transactions). The total outstanding amount held on account comprises mainly securities issued by the Belgian government, such as *treasury certificates* (short-term securities), *linear bonds* (OLOs) and *strips*. It also comprises short- and long-term securities issued by other government bodies or by the private sector. For securities denominated in euros, the SSS ensures the payment of interest and the redemption of capital.

4.3.1.4 Operation of the system

The NBB-SSS operates on an *integrated model*, by which the NBB manages accounts for both securities and cash. NBB-SSS is linked to the SSP (single shared platform) of TARGET2 via the TARGET2 ASI (ancillary systems interface).

About 20 batches a day are run throughout the working hours. Each batch performs gross settlement of eligible transactions, meaning that each transaction results in the simultaneous settlement of one cash and one securities movement (on a DVP1 basis). In other words, the process checks the effective provision of cash (for the buyer) and of securities (for the seller) before settling the relevant transaction.

The batches are run between 08:00 and 16:30 for free-of-payment (FOP) and DVP transactions; additional batches may occur between 16:30 and 18:00, but only on a FOP basis and for collateral transactions involving one Eurosystem national central bank.

Each of these batches starts at a predetermined time with the aim of settling the selected transactions, provided there is sufficient cash and security provision. Those transactions not selected (owing to a lack of securities or cash or to other selection criteria) remain in the queue and are taken up again when the next batch is run.

The selection parameters for each successive batch are progressively widened through the day.

4.3.1.5 Risk management

When both notifications to a transaction have been entered into the system by the counterparties, and after registration of such notifications, they are subject to matching prior to settlement.

The bulk of the notifications, sent to the system via the SWIFT network, are automatically authenticated, subject to an exchange of SWIFT keys between the NBB and the participant involved.

Participants located in Belgium can also use a secured communications network (developed by the Belgian banking community) to send their orders to the settlement system. The NBB-SSS participants have also access to the WIROW interface, which allows them to monitor the status of their transactions among other information.

To reduce the risks arising from counterparty errors or omissions, the system regularly updates the status details of participants' notifications. Participants can verify the status of their notifications online and respond to any unmatched notifications.

NBB-SSS offers an automatic securities lending facility to its participants. The borrowed securities are covered by a pledge of securities taken by the system from the borrower's own holdings (on a fully collateralised basis). These loans are granted without the direct intervention of the lenders and borrowers. The automatic securities lending process is undertaken at the end of the last DVP settlement batch of the day, scheduled for completion at 16:30. The repayment procedure is also automated.

The system operates according to the pooling principle whereby a number of lenders make securities available to participants which need them to settle their planned transactions. This process is fully confidential, with the identity of the lenders not being revealed to the borrowers and vice versa. The automatic securities lending works in such a way as to guarantee fair distribution of the loans in the long run in terms of amounts offered by each potential lender.

4.3.1.6 Links to other systems

NBB-SSS has no outbound links to other systems.

4.3.1.7 Pricing

The fee structure includes a monthly flat-rate fee as well as a monthly custody fee per participant identification number in the system. There is also a fee per query launched in the WIROW application.

4.3.2 Euroclear Belgium

Euroclear Belgium (formerly CIK²) has merged with the French and Dutch CSDs to form the Euroclear Settlement of Euronext-zone Securities (ESES) system, launched in January 2009. Although Euroclear Belgium remains legally a separate SSS, its settlement activity is integrated within the ESES platform. For ESES, see the descriptive Red Book chapter on the euro area.

4.4 Use of securities infrastructure by the central bank

Generally speaking, the NBB makes use of the SSS located in Belgium for two main purposes: the holding and management of its own securities portfolio, and the management of the collateral provided by counterparties for monetary policy operations or to cover intraday credit facilities.

² Caisse Interprofessionnelle de Dépôts et de Virements de Titres SA / Interprofessionele Effectendeposito- en Girokas NV.

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

Contents

Introduction.....	31
1. Institutional aspects	31
1.1 The general institutional framework	31
1.1.1 Payment instruments and payment systems.....	32
1.1.2 Securities clearing and settlement	32
1.2 The role of the central bank	33
1.2.1 Supervision and administration.....	33
1.2.2 Provision of clearing services	34
1.2.3 Cooperation with other regulators.....	34
1.3 The role of other private and public sector bodies.....	35
1.3.1 Payment service providers	35
1.3.2 Institutions providing clearing and settlement service	35
1.3.3 Role of other private and public sectors	36
2. Payment media used by non-banks	36
2.1 Cash payments.....	36
2.2 Non-cash payments.....	37
2.2.1 Non-cash payment instruments	37
2.2.2 Non-cash payment terminals	40
2.2.3 Recent developments.....	41
2.2.4 Interchange fee regulation	41
3. Interbank clearing and settlement systems	42
3.1 General overview.....	42
3.2 High-Value Payment System (HVPS)	42
3.2.1 Institutional framework.....	42
3.2.2 Participation.....	42
3.2.3 Types of transactions	42
3.2.4 Operation of the system.....	43
3.2.5 Settlement procedures.....	43
3.2.6 Risk management.....	43
3.2.7 Pricing	44
3.2.8 Major ongoing and future projects	44
3.3 Bulk Electronic Payment System (BEPS)	44
3.3.1 Institutional framework.....	44
3.3.2 Participation.....	44
3.3.3 Types of transactions	45
3.3.4 Operation of the system.....	45

3.3.5	Netting and settlement.....	45
3.3.6	Risk management.....	45
3.3.7	Pricing	46
3.3.8	Development of the new-generation payment system.....	46
3.4	Internet Banking Payment System (IBPS).....	46
3.4.1	Institutional framework.....	46
3.4.2	Participation.....	46
3.4.3	Types of transactions.....	46
3.4.4	Operation of the system.....	46
3.4.5	Settlement procedures.....	46
3.4.6	Risk management.....	47
3.4.7	Pricing	47
3.5	Local clearing systems.....	47
3.5.1	Institutional framework.....	47
3.5.2	Participation.....	47
3.5.3	Types of transactions.....	47
3.5.4	Operation of the system.....	47
3.5.5	Settlement procedures.....	47
3.5.6	Risk management.....	48
3.5.7	Pricing	48
3.6	Cheque Image System (CIS)	48
3.6.1	Institutional framework.....	48
3.6.2	Participation.....	48
3.6.3	Types of transactions.....	48
3.6.4	Operation of the system.....	48
3.6.5	Settlement procedures.....	48
3.6.6	Risk management.....	48
3.6.7	Pricing	49
3.7	China Domestic Foreign Currency Payment System (CDFCPS).....	49
3.7.1	Institutional framework.....	49
3.7.2	Participation.....	49
3.7.3	Types of transactions.....	49
3.7.4	Operation of the system.....	49
3.7.5	Settlement procedures.....	49
3.7.6	Risk management.....	50
3.7.7	Pricing	50
4.	Systems for post-trade processing, clearing and securities settlement	50

4.1	General overview.....	50
4.2	Central counterparties and clearing systems	50
	4.2.1 SD&C securities clearing system.....	50
	4.2.2 SHCH clearing system.....	52
4.3	Securities settlement systems	53
	4.3.1 CCDC Central Bond Generalized System (CBGS)	53
	4.3.2 SHCH registration and settlement system	56
	4.3.3 SD&C securities settlement system.....	57
4.4	Use of securities infrastructure by the central bank.....	58

List of abbreviations

ABS	Central Bank Accounting Booking System
ATM	automated teller machine
BEPS	Bulk Electronic Payment System
CBBS	Central Bond Bookkeeping System
CBGS	Central Bond Generalized System
CBRC	China Banking Regulatory Commission
CCP	central counterparty
CCPC	City Clearing Processing Center
CCCB	Clearing Center for City Commercial Banks
CCDC	China Central Depository & Clearing Co., Ltd.
CDFCPS	China Domestic Foreign Currency Payment System
CFETS	China Foreign Exchange Trading System
CFSTC	China Finance Standardization Technical Committee
CIRC	China Insurance Regulatory Commission
CIS	Cheque Image System
CMU	Central Moneymarkets Unit
CRMW	Credit Risk Mitigation Warrants
CSRC	China Securities Regulatory Commission
CNAPS	China National Advanced Payment System
CNCC	China National Clearing Center
DAP	delivery after payment
DVP	delivery versus payment
ECDS	Electronic Commercial Draft System
FOP	free of payment
HKMA	Hong Kong Monetary Authority
HVPS	High-Value Payment System
IBPS	Internet Banking Payment System
IC	integrated circuit
L/C	letter of credit
MOF	Ministry of Finance
NPC	National Processing Center
OTC	over-the-counter
PAD	payment after delivery

China

PBC	The People's Bank of China
POS	point of sale
RCBFCC	Rural Credit Banks Funds Clearing Center
RMB	renminbi
RTGS	real-time gross settlement
SCP	Super & Short-term Commercial Paper
SD&C	China Securities Depository and Clearing Corporation Limited
SHCH	Shanghai Clearing House
STP	straight through processing

Introduction

In recent years, China's national payment system has progressed remarkably and has played an important role in driving the country's economic and social development. Following the diversification of payment service providers, a framework of market players has been formed. Payment services have become increasingly market-oriented.

The RMB bank settlement account management system has been continuously improved, and administration for financial accounts based on real names¹ has been strengthened. A range of non-cash payment instruments are widely used, with negotiable instruments and bankcards accounting for the main part, supplemented by internet payments, telephone payments and other electronic payments.

China has set up an architecture with the payment systems of the People's Bank of China (PBC) as the backbone, the payment systems of banking institutions as the main part and systems such as the interbank bankcard transaction clearing system, foreign exchange settlement system and securities settlement system as important components. PBC has developed several interbank payment systems, including the High-Value Payment System (HVPS, an RTGS system), the Bulk Electronic Payment System (BEPS), the Cheque Image System (CIS), the Internet Banking Payment System (IBPS) and the China Domestic Foreign Currency Payment System (CDFCPS). HVPS and BEPS are the application systems of the China National Advanced Payment System (CNAPS).

The three main providers of securities settlement systems in China are China Central Depository & Clearing Co., Ltd. (CCDC), Shanghai Clearing House (SHCH) and China Securities Depository and Clearing Corporation Limited (SD&C). Trades from the interbank bond market are settled via CCDC and SHCH, and trades from the exchange bond market are cleared and settled via SD&C. SD&C also provides stock exchange markets with such services as centralised registration, custody, clearing and settlement.

The supervision and administration framework for China's national payment system has taken shape. The risk prevention capability of the system is being continuously enhanced, following the establishment of a legal framework for payment and settlement.

1. Institutional aspects

1.1 The general institutional framework

The *Law of the People's Republic of China on the People's Bank of China (Law on the People's Bank of China)* was promulgated in 1995 and amended in 2003. According to the law, PBC's responsibilities are to "maintain the normal operation of payment and clearing systems in China". The *Law of the People's Republic of China on Commercial Banks (Law on Commercial Banks)* amended in the same year stipulates that PBC has the right to supervise and regulate commercial banks in accordance with the *Law on the People's Bank of China*.

The *Securities Law of the People's Republic of China (Securities Law)*, promulgated in 1998 and amended in 2005, serves as the highest-level legal norm governing securities registration and settlement activities. The law explicitly defines the responsibility of the China Securities Regulatory Commission (CSRC) for the supervision and administration of securities registration and settlement institutions and businesses in the securities market. It

¹ It is not permitted to open anonymous accounts or accounts in fictitious names in financial institutions.

also stipulates the related legal relations among securities registration and settlement institutions and the important principles for securities registration and settlement activities.

1.1.1 Payment instruments and payment systems

The *Law of the People's Republic of China on Negotiable Instruments (Law on Negotiable Instruments)*, promulgated in 1995 and amended in 2004, governs such activities as issue, endorsement, acceptance, guarantee, payment and claim related to drafts, promissory notes and cheques. It also defines the rights, obligations and legal responsibilities of the parties involved in negotiable instrument activities.

The *Regulations of the People's Republic of China on Administration of Renminbi*, promulgated in 2000, provides for the design, printing, issuance, withdrawal and circulation of RMB. It also defines the rights, obligations and legal responsibilities of institutions and individuals in the use of RMB. The *Interim Regulations on Cash Management*, promulgated in 1988, stipulate the amount and use of RMB retained by institutions.

Apart from the above laws and regulations, the *Administrative Measures for Implementation of Negotiable Instruments* and the *Measures for Payment and Settlement* were promulgated in 1997, providing for the basic business rules of various payment instruments and legal responsibilities of different parties involved in transacting negotiable instruments. The *Administrative Measures for Bankcard Business* promulgated in 1999 lay down the rules for bankcard business, interest rates and fees, account and transaction management, risk management and legal responsibility. The *Administrative Measures for RMB Bank Settlement Accounts* promulgated in 2003 regulate the opening, use and management of settlement accounts. The *Administrative Measures for Payment Services Provided by Non-financial Institutions* promulgated in 2010 define the market access, supervision and administration of payment institutions undertaking online payment, issue and acceptance of prepaid cards and acquisition of bankcards.

1.1.2 Securities clearing and settlement

PBC and CSRC are responsible for the oversight and administration of the interbank bond market and the stock market, respectively. The Ministry of Finance (MOF) and China Banking Regulatory Commission (CBRC) have also assumed some responsibility for the oversight and administration of the interbank bond market.

The *Administrative Measures for Bond Transactions in the National Interbank Bond Market* and the *Administrative Measures for Registration, Custody and Settlement of Bonds in the Interbank Bond Market* formulated by PBC stipulate the qualifications of participants and bond registration, trading, custody and settlement in the interbank bond market. The *Interim Administrative Measures for Custody of Treasury Bonds of the People's Republic of China* formulated by the MOF aim at protecting the legitimate rights and interests of treasury bond investors and regulate treasury bond custody activities.

The *Administrative Measures for Securities Registration and Settlement* promulgated in 2006 and amended in November 2009 by CSRC form the legal basis regulating securities registration and settlement. They provide for the important principles, basic procedures for securities registration, clearing and settlement, and the legal relationship among related market players.

The *Measures for the Administration of Securities Settlement Risk Fund* were jointly promulgated by CSRC and MOF in 2006 and formally implemented the same year. The securities settlement risk funds are earmarked funds formed according to the Measures. These funds are used to make up for the losses of securities registration, clearing and settlement institutions incurred due to default, technical failure, maloperation or force majeure, for the purpose of preventing and hedging securities market risks and maintaining the safe operation of securities registration, clearing and settlement systems.

1.2 The role of the central bank

1.2.1 Supervision and administration

The People's Bank of China issues RMB, manages the circulation of RMB and administers its own banknote printing and coin minting enterprises according to the *Law on the People's Bank of China*. Apart from design, printing and issuance of RMB, PBC is also responsible for recalling and destroying damaged or spoiled RMB as well as authenticating RMB.

PBC oversees RMB accounts from the aspects of implementation of the real-name policy and normalisation of routine use of the RMB account, in accordance with laws and regulations such as Article 16.5 and Article 32.1.4 of the *Law of the People's Republic of China on Anti-Money Laundering (Anti-Money Laundering Law)* and the *Provisions Concerning the Real-Name Personal Deposit Account System* (No.285 Decree of the State Council of the People's Republic of China). PBC is responsible for the management of the reserve accounts opened by financial institutions with PBC and settlement accounts opened by customers with banking institutions. According to the *Administrative Measures for RMB Bank Settlement Accounts* promulgated in 2003, opening or cancellation of bank settlement accounts for their customers shall be approved by or filed with PBC.

PBC is legally authorised to penalise the depositors and banking institutions which violate the regulations on the management of bank settlement accounts, and oversees the opening, use, modification and cancellation of bank settlement accounts through on-site and off-site inspection. On-site inspection mainly focuses on the annual inspection conducted by PBC branches for the bank settlement accounts within their respective jurisdiction. Off-site inspection refers to the filing or approval of bank settlement accounts by the RMB bank settlement account management system.

According to Article 108 of the *Law on Negotiable Instruments* "the administrative measures for format and printing of negotiable instruments shall be stipulated by PBC". PBC is responsible for the administration of format and printing of negotiable instruments. Article 109 of the *Law on Negotiable Instruments* stipulates that "the specific implementation measures for the administration of negotiable instruments shall be formulated by PBC according to the law and implemented with the approval of the State Council"; Articles 31 and 34 of the *Administrative Measures of Implementation of Negotiable Instruments* stipulate that an administrative penalty shall be imposed on those issuing dud cheques, issuing cheques with signatures/seals inconsistent with the specimen held in banks, or printing negotiable instruments without authorisation.

PBC lays down payment and settlement rules jointly with the State Council's banking regulator in compliance with Article 27 of the *Law on the People's Bank of China*, and oversees the payment and settlement business of banking institutions accordingly. Regulatory measures include inspection, penalty, public criticism and moral suasion. Furthermore, PBC is responsible for policies around the development of the bankcard industry and plays an important role in improving the bankcard environment with its related technical standards to prevent bankcard risks and bankcard crime.

The *Law on the People's Bank of China* has three articles defining PBC's role as a catalyst, operator and regulator of payment, clearing and settlement systems.² Any institution or

² Article 4.9 of the Law on the People's Republic of China states "Maintaining the normal operation of the payment, clearing, and settlement systems"; Article 27 states "The People's Bank of China shall organize or assist in organizing clearing systems among banking institutions, coordinate the efforts of such institutions in matter of clearing and provide services in this regard"; and Article 32 states "The People's Bank of China shall have the right of inspecting the implementation of relevant clearing regulations for banking institutions and other institutions and individuals".

individual in violation of relevant provisions of clearing services shall be subject to moral suasion, warning, confiscation of illegal income or imposition of a fine; those committing a crime shall be subject to criminal liability. Moreover, PBC is responsible for the market access of payment services of non-financial institutions and regulation of their payment activities.

PBC is also committed to the development of the bond market and supervises and administers the interbank bond market according to the *Law on the People's Bank of China*. PBC conducts open market operations and implements monetary policy through the interbank bond market.

PBC, as the administrative authority in charge of China Finance Standardization Technical Committee (CFSTC), is responsible for the organising, administration and coordination of financial standardisation. PBC formulates technical specifications and business standards via the CFSTC.

1.2.2 Provision of clearing services

Since 2002, PBC has developed a number of interbank clearing systems, including the China National Advanced Payment System (CNAPS), China Domestic Foreign Currency Payment System, and local clearing systems, to support the application of negotiable instruments, bankcards and other payment instruments. CNAPS is operated by the China National Clearing Center (CNCC) and local clearing systems are mainly operated by PBC branches. At the end of 2010, PBC branches owned and operated 1,017 local clearing houses which provide clearing services for cheques, bank drafts, commercial drafts and banker's promissory notes, etc.

As the bank of the government, PBC has the responsibility of managing the state treasury, managing single accounts of the treasury and overseeing the opening of fiscal deposit accounts. It also provides related services for government payments.

1.2.3 Cooperation with other regulators

Under the leadership of the State Council, PBC has established a financial supervision coordination mechanism with CBRC, CSRC and China Insurance Regulatory Commission (CIRC) (hereinafter collectively called "PBC and the three commissions"). PBC and the three commissions have strengthened the cooperation and coordination in formulating and implementing monetary and regulatory policies through interdepartmental meetings. They share financial information and jointly study major issues in the financial field, analyse situations and put forward suggestions on prevention of crises and potential risks on a regular or irregular basis.

In March 2009, PBC signed the memorandum of understanding with the Hong Kong Monetary Authority (HKMA) on issues concerning interconnection between a number of monetary payment systems of the Chinese mainland and Hong Kong. In June, PBC and HKMA signed a supplementary memorandum of cooperation, and reached a consensus on the provision of RMB settlement services by banks in Hong Kong. In December 2009, PBC and the Monetary Authority of Macao signed a supplementary memorandum of regulatory cooperation, reaching agreement on regulating individual RMB services and cross-border RMB settlement services provided by banks in Macao, according to their respective responsibilities.

PBC has established a cross-border supervision cooperation mechanism with the central banks of the countries/regions issuing related settlement currencies of the China Domestic Foreign Currency Payment System (CDFCPS), and provides related operation data to these central banks on a quarterly basis.

1.3 The role of other private and public sector bodies

1.3.1 Payment service providers

1.3.1.1 Banking institutions

Banking institutions are commercial banks, urban and rural credit cooperatives and other financial institutions that take deposits from the public. Banking institutions also include policy banks³ set up within the territory of the People's Republic of China. According to the *Law on Commercial Banks*, banking institutions may engage in payment and settlement business with the approval of the State Council's banking regulator. Banking institutions are the primary providers in the payment services market, offering a range of payment services to the general public via their network in urban and rural areas.

1.3.1.2 Non-bank financial institutions

Finance companies of enterprise groups (finance companies) are non-bank financial institutions established to enhance the centralised management and improve the efficiency of the funds of enterprise groups, and to provide financial management services for members of groups. According to the *Measures for the Administration of Finance Companies of Enterprise Groups* issued by CBRC, finance companies may provide services of collecting and paying money, accepting bills, discounting bills and so on to their members.

Without approval from PBC, any non-bank financial institution is forbidden to engage in payment and settlement business.

1.3.2 Institutions providing clearing and settlement service

1.3.2.1 China UnionPay Co., Ltd.

China UnionPay Co., Ltd. (China UnionPay) is approved and overseen by PBC to provide clearing services for bankcard transactions between issuing institutions and acquiring institutions. It was jointly initiated and established by domestic banking institutions in March 2002 and has its head office in Shanghai.

1.3.2.2 Clearing Center for City Commercial Banks (CCCB)

CCCB, a non-profit-oriented entity for its members, mainly engages in clearing services and other business approved by PBC. It was initiated by city commercial banks in September 2002 and is registered in Shanghai. It clears transactions relating to bank drafts, online payments, and interbank deposits and withdrawals. It mainly serves city commercial banks, urban credit cooperatives and rural banks.

1.3.2.3 Rural Credit Banks Funds Clearing Center (RCBFCC)

RCBFCC provides clearing services for real-time electronic fund transfers, bank drafts, and interbank deposits and withdrawals for China's rural credit cooperatives, rural commercial banks, rural cooperative banks and other local financial institutions. RCBFCC was jointly set up by 30 provincial rural credit unions, rural commercial banks and Shenzhen Rural Commercial Bank, and is registered in Beijing.

³ Export-import Bank of China and Agricultural Development Bank of China.

1.3.2.4 Local clearing houses

Local clearing houses are institutions that provide physical negotiable instrument exchanges or clearing services for local banking institutions. At the end of 2010, there were 144 local clearing houses owned and operated by private entities in China.

1.3.2.5 China Central Depository & Clearing Co., Ltd. (CCDC)

Founded in 1996, CCDC is responsible for the registration, custody and settlement of most fixed income securities on the interbank bond market. It has linkage with the Open Market Operations System of PBC and provides intermediary and information services in the bond market.

1.3.2.6 Shanghai Clearing House (SHCH)

Founded in 2009, SHCH mainly provides RMB and foreign currency clearing services for both spot and derivatives markets. It is primarily engaged in registration, depository, clearing, settlement, margin management, collateral management, as well as information and advisory services. At present, it provides clearing, settlement, registration and depository services for such financial products as Credit Risk Mitigation Warrants (CRMW) and Super & Short-term Commercial Paper (SCP). SHCH is regulated and overseen by PBC.

1.3.2.7 China Securities Depository and Clearing Corporation Limited (SD&C)

Founded in 2001 and registered in Beijing, SD&C is the sole operator of the registration, clearing and settlement system for the stock market. SD&C has a Beijing Data Branch, a Shanghai Branch and a Shenzhen Branch. It is a non-profit-oriented legal entity established with the approval of CSRC. With its securities clearing and settlement system covering the Shanghai Stock Market and Shenzhen Stock Market and also acting as a central counterparty (CCP) for these two markets, SD&C provides centralised registration, depository, clearing and settlement services on the securities market, and conducts industry self-discipline management.

1.3.3 Role of other private and public sectors

CFSTC is an organisation drafting standards for the financial sector, under the leadership of PBC. The experts of CFSTC come from PBC, CBRC, CSRC, CIRC, financial institutions and research institutions. During the development of standards, CFSTC widely consults with banks, payment institutions, merchants and end users. These standards help to promote the IT application of banking business.

2. Payment media used by non-banks

2.1 Cash payments

Cash is primarily used in face-to-face retail payments. Cash is mostly held by domestic residents, enterprises and institutions. Only a small amount of cash flows to foreign countries.

At the end of 2010, cash in circulation (M_0) amounted to CNY 4,462.8 billion (Table 1). During 2006–10, M_0 maintained a high growth rate, higher than that of GDP. M_0 increased by 64.84% in 2010 as compared to 2006.

Table 1
Cash in circulation in China, 2006–10

	2006	2007	2008	2009	2010
M ₀ (CNY 100 million)	27,073	30,334	34,219	38,247	44,628
Year-on-year growth (%)	–	12.05%	12.81%	11.77%	16.68%

Source: China Payment System Development Report.

At present, RMB banknotes are available in denominations of 1 jiao, 2 jiao, 5 jiao, 1 yuan, 2 yuan, 5 yuan, 10 yuan, 20 yuan, 50 yuan and 100 yuan, while coins have values of 1 fen, 2 fen, 5 fen, 1 jiao, 5 jiao and 1 yuan. PBC also issues a certain amount of negotiable ordinary commemorative coins (notes) for significant events.

2.2 Non-cash payments

2.2.1 Non-cash payment instruments

Non-cash payment instruments mainly include negotiable instruments, bankcards and remittances. In 2010, in terms of volume, they accounted for 3.24%, 92.97% and 3.69%, respectively, of total transactions using non-cash payment instruments. In terms of value, the respective percentages were 31.43%, 27.26% and 40.07% (Table 2).

Table 2
Market share of main non-cash payment instruments in China, 2006–10 (in per cent)

	2006		2007		2008		2009		2010	
	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value
Negotiable instruments	9.23	47.87	6.33	39.88	4.81	39.71	4.09	37.73	3.24	31.43
Bankcards	84.54	15.04	88.10	18.80	90.96	20.09	91.95	23.19	92.97	27.26
Remittances	4.89	34.88	4.45	39.80	4.03	38.99	3.82	37.75	3.69	40.07

Source: China Payment System Development Report.

2.2.1.1 Cheques

Cheques can be used to withdraw cash and transfer funds, and are mainly used for making payments by governments and enterprises. In 2010, about 872 million cheques were issued, for a total amount of CNY 260.5 trillion, accounting for 92% of total transaction value of negotiable instruments.

Cheques used in local areas are generally cleared by local clearing houses, and physical bills are delivered to drawers' banks via clearing houses. If a cheque is not bounced within the required time, the payee bank has to transfer the money to the beneficiary account.

In 2007, PBC set up the Cheque Image System (CIS), which achieves cheque image transmission and truncation of physical cheques. It allows for the nationwide use of cheques with an amount below CNY 500,000. In 2010, a total of 8,784,300 transactions were processed via CIS, with a total amount of CNY 404,246 million. Cheque drawers pay CNY 30 to acquire a chequebook containing 25 cheques.

PBC, together with HKMA, launched a two-way settlement of HKD cheques and one-way settlement of RMB cheques in Guangdong Province and Hong Kong. RMB cheques are only used for consumption in Guangdong Province by Hong Kong residents, with a maximum amount of CNY 80,000 per cheque. Two-way settlement of USD cheques was launched in Shenzhen and Hong Kong. Cross-border cheque exchange is carried out by domestic clearing centres and Hong Kong Interbank Clearing Limited. Cross-border funds clearing is carried out via clearing agents. In 2010, 366,800 HKD cheques, 15,000 USD cheques and 700 RMB cheques were handled with a total amount of HKD 41,847 million, USD 450 million and CNY 35 million, respectively.

Any dud cheque or cheque with the signature and seal inconsistent with the specimen held in the bank is bounced, and the drawer will be fined by PBC at 5% of the par value but not less than CNY 1,000. The bearer has the right to demand compensation at 2% of the par value from the drawer. Any institution or individual that issues dud cheques frequently will be forbidden to issue cheques.

Since 2010, drawers have been able to apply for a credit facility from banks. A bank will credit the drawer's account within the predetermined credit line. The cheque credit facility is popular among banks and small to medium-sized enterprises.

2.2.1.2 *Bank drafts*

Bank drafts are a kind of negotiable instrument issued by a bank for enterprises or individuals after they deposit in the bank, used to handle inter-city funds transfers or cash withdrawals. Bank drafts are classified as national drafts or (the majority) regional drafts (limited to use in Jiangsu, Zhejiang and Anhui provinces and Shanghai). Regarding drafts for funds transfer issued by different banks, the drafts are to be delivered to the relevant banks for review and disbursement through local clearing houses. After disbursement of a draft, the clearing and settlement between drawer banks and correspondent banks is processed via PBC. In addition, small and medium financial institutions with only a few branches making payments by bank drafts may do this via RCBFCC or CCCCB. In 2010, the transaction volume and value of bank drafts reached 6,792,400 and CNY 4 trillion, respectively.⁴

BEPS has handled regional drafts since December 2008. Correspondent banks accept and review interbank drafts submitted by bearers. Then, they send the related information to drawer banks via BEPS, and pay in real time upon receipt of funds from drawer banks. Bank draft applicants pay a commission of CNY 1 per draft to drawer banks.

2.2.1.3 *Commercial drafts*

Commercial drafts are a kind of negotiable instrument issued by enterprises to entrust the payer to pay the specified amount to the beneficiary or the bearer on the designated date unconditionally. Commercial drafts are divided into commercial acceptance drafts and banker's acceptance drafts. Commercial draft's payers are the acceptors. Commercial acceptance drafts are accepted by payers other than banks, while banker's acceptance drafts are accepted by banks. Banks may charge 0.05% of par value when accepting.

⁴ Accounting for 0.76% and 1.41% of the total volume and value of negotiable instrument transactions, respectively.

Commercial drafts are applicable to commodity transactions. The buyer and the seller may determine a payment period within six months or one year in the case of electronic commercial drafts. The bearer may purchase commodities with the accepted drafts or apply to discount. Upon expiration of commercial drafts, the beneficiary or bearer entrusts its bank to present the draft to the payer bank by exchange or mail. Interbank clearing of commercial drafts is processed by PBC. In 2010, the actual transaction volume and value of commercial draft payments reached 9,367,100 transactions and CNY 10.85 trillion.⁵

The Electronic Commercial Draft System (ECDS) of PBC was put into operation in October 2009, and rolled out nationwide in June 2010, and is also used to support dematerialisation of paper-based commercial drafts with seals or signatures. ECDS minimises fraud risk of commercial drafts. It can support issuances, endorsements, discounts, interbank discounts, rediscounts, pledges, cancellation of pledges, guarantees, presentations and recourses of electronic commercial drafts. Interbank fund clearing of electronic commercial drafts is processed by PBC.

In 2010, 320 banks and finance companies were engaged in electronic commercial draft business, and a total of 284,100 transactions were processed by ECDS, with a total amount of CNY 1 trillion.

2.2.1.4 *Banker's promissory notes*

Banker's promissory notes are issued by a bank to an applicant after depositing in the bank. They can be used for funds transfers or withdrawals, or be endorsed within the same clearing region. The note should be payable at sight. With respect to notes with different banks, correspondent banks may charge interest from issuing banks at the interbank offered rate. Banker's promissory notes are widely used in some relatively developed cities and in the regions with a prosperous commodity market.

BEPS has handled banker's promissory notes since May 2008. Correspondent banks receive and review the notes submitted by bearers, then send related information to issuing banks via BEPS, and pay in real time upon receipt of funds from issuing banks. The correspondent banks may not charge interest on funds paid in advance.

In 2010, a total of 7,860,600 banker's promissory notes were issued, for an amount of CNY 8.61 trillion.⁶

2.2.1.5 *Bankcards*

All bankcards are issued by commercial banks and are bundled with functions such as consumption credit, funds transfer, deposit and withdrawal. Bankcards are divided into debit cards and credit cards. Credit cards have a maximum interest-free repayment period of 60 days. Credit card holders can apply for supplementary cards.

Bankcards are the most popular payment instrument for residents. Debit cards account for around 80% of all cards. At the end of 2010, more than 2.4 billion bankcards had been issued. Expenditure by bankcard (excluding real estate, automobile sales and wholesale transactions) accounted for 35.1% of the total value of retail sales.

⁵ Accounting for 1.04% and 3.82% of the total volume and value of negotiable instrument transactions.

⁶ Accounting for 3.02% of total negotiable instrument transactions.

Table 3
Bankcards issued, 2006–10

Year-end figures

	2006	2007	2008	2009	2010
Number of cards (in millions)	1,131	1,500	1,800	2,066	2,415

Source: China Payment System Development Report.

In 2005, PBC issued the *China Financial Integrated Circuit Card Specifications* (JR/T 0025-2005) as the basic technical standards for integrated circuit (IC) card applications in the financial sector. China launched pilot projects for financial IC card applications, and gradually introduced IC cards into such fields as social insurance, transport and medical treatment.

2.2.1.6 Remittances

Remittances mainly involve credit transfers. They have been the primary means of inter-city payment for a long time. The value of remittances accounts for the largest proportion of that of payment instruments. Interbank remittances are generally processed by PBC. Part of local remittances is processed by local clearing systems. In addition, remittances originated by small and medium financial institutions with only a few branches may be cleared via RCBFCC or CCCC. The volume of remittances reached 1,022 million transactions in 2010, for a total amount of CNY 362.72 trillion.

2.2.1.7 Domestic letters of credit (domestic L/C)

Domestic L/C are issued by a bank to the beneficiary at the request of the applicant, within a specified period based on the related documents. In 2010, the volume and value of domestic L/C reached 61,200 transactions and CNY 557,316 million.

2.2.1.8 Regular debit/credit

Regular debit is a kind of bulk collection originated regularly by the beneficiary's bank to the payer's bank based on the contracts/agreements. It can be used to collect utility fees for water, electricity and gas, etc. Regular credit is a kind of bulk payment originated regularly by the payer's bank to the beneficiary's bank based on the contracts/agreements. It can be used to pay salaries, pensions, insurance premiums and treasury, etc. Contracts or agreements shall be signed between debit beneficiaries and banks and between credit payers and banks to define their respective rights and responsibilities. Interbank regular debit/credit transactions are generally processed by PBC. Part of local regular debit/credit transactions is processed by local clearing system.

2.2.2 Non-cash payment terminals

Terminals accepting bankcards mainly include ATMs and POS terminals.

ATMs have the functions of inquiry, funds transfer, deposit and withdrawal. Some new ATMs also have such functions as loading value for mobile phones, paying utility bills, etc.

ATMs are emplaced and maintained by commercial banks or third parties, while cash loading is done only by the commercial banks. The services provided by different commercial banks via ATMs have no difference, but differ slightly in charging.

POS terminals are mainly used in consumption. POS terminals can be emplaced by acquiring institutions or third parties. In general, POS terminals are not allowed to be used for

withdrawal. However, to improve the payment environment in rural areas, withdrawals below CNY 1,000 are allowed at chartered merchants / appointed stores.

At the end of 2010, there were 2,183,000 chartered merchants, 3,334,000 POS terminals and 271,000 ATMs, respectively.

Table 4

**Number and growth rate of chartered merchants,
POS terminals and ATMs, 2006–10**

Item		2006	2007	2008	2009	2010
Chartered merchants (10,000)	Growth rate (%)	12.67	21.82	44.25	38.48	61.65
	At year-end	52.1	73.92	118.17	156.65	218.3
POS terminals (10,000)	Growth rate (%)	21.04	36.32	66.39	56.32	92.57
	At year-end	81.8	118.12	184.51	240.83	333.4
ATMs (10,000)	Growth rate (%)	1.57	2.52	4.45	4.74	5.61
	At year-end	9.78	12.3	16.75	21.49	27.1

Source: China Payment System Development Report.

2.2.3 Recent developments

With the rapid development of IT and the internet, electronic payments, especially online payments, have developed rapidly.

Online payments include internet payments, mobile payments, telephone payments and digital TV payments through public or dedicated networks. Among them, internet payments play a dominant role.

At present, banks are the primary providers of internet payment services. They can provide the services independently or cooperate with non-financial institutions to do so. In 2010, the total number of internet payment users of commercial banks reached 246 million, and the volume and value reached 8,498 million and CNY 522.39 trillion, respectively. Interbank clearing for internet payments is mainly processed by PBC.

China's mobile payments have developed rapidly. At the end of 2010, there were 859 million mobile phone users. Mobile payments can be used for remote payments and near-field payments. The total number of mobile payment users of commercial banks reached 90 million, and the volume and value reached 118 million and CNY 570 billion, respectively.

2.2.4 Interchange fee regulation

The interchange fee for international bankcards used in China shall comply with the rules of international card organisations, while the fee for domestic bankcards shall comply with relevant domestic provisions.

3. Interbank clearing and settlement systems

3.1 General overview

PBC has developed several interbank payment systems, which include the High-Value Payment System (HVPS), the Bulk Electronic Payment System (BEPS), the Cheque Imaging System (CIS), the Internet Banking Payment System (IBPS) and the China Domestic Foreign Currency Payment System (CDFCPS). These systems are owned by PBC. HVPS, BEPS and IBPS are the three primary application systems of the China National Advanced Payment System (CNAPS). As the RTGS system in China, HVPS has been in operation nationwide since June 2005.

3.2 High-Value Payment System (HVPS)

HVPS mainly handles inter-city and local credit transfers above a given value as well as urgent low-value transfers electronically. Payment instructions are sent in real time and cleared transaction by transaction.

3.2.1 Institutional framework

PBC has promulgated the *Measures for Processing of HVPS Business*, *Procedures for Processing of HVPS Business*, *Measures for Administration on Automatic Pledge Financing*, *Measures for Operational Administration on China National Advanced Payment System* and *Measures for Administration on Access into and Withdrawal from Payment System of Banking Institutions* to lay down the rights, obligations and responsibilities of the parties concerned.

3.2.2 Participation

Participants in HVPS are divided into direct, indirect and chartered participants.

Direct participants are the commercial banks which have RMB reserve accounts⁷ with PBC, and are directly linked to HVPS through their internal systems. Direct participants also include city-level branches of PBC.

Indirect participants are the commercial banks which have no direct link to HVPS and entrust direct participants to submit and receive interbank payments. Indirect participants also include county-level branches of PBC.

Chartered participants are approved by PBC to have direct access to the payment system as a third party. They can handle specified payment transactions by HVPS.

At the end of 2010, there were 1,729 direct participants, 100,510 indirect participants and 6 chartered participants.

3.2.3 Types of transactions

Transactions processed in HVPS are ordinary credit transfers, third-party funds transfers and local netting transactions.

Ordinary credit transfers are originated by the payer's bank and sent in real time to the National Processing Center (NPC), which transfers the funds to the payee's bank immediately after settlement.

⁷ With the approval of PBC.

Intermediary credit transfers are originated by the chartered participants. They send netting positions or gross positions of related trading parties to HVPS for debiting or crediting of trading parties' accounts. After settlement, HVPS notifies the third party, debtors and creditors.

Local netting transactions are net amounts to be settled that are submitted by local clearing houses through local PBC branches.

3.2.4 Operation of the system

CNAPS has two tiers of processing centres, the National Processing Center (NPC) and processing centres at provincial cities, plus Shenzhen City Clearing Processing Centers (CCPCs). CCPCs are connected to NPC by dedicated communication networks. For transactions processed in HVPS, NPC receives and forwards payment transactions, and submits transactions to the clearing account management system in real time. CCPCs are responsible for forwarding and receiving payment transactions. The participants are mainly connected to CCPCs. But chartered participants, such as CCDC and SHCH, connect directly to NPC.

Bank of China (Hong Kong) and Bank of China (Macao) have joined HVPS as direct participants. They are clearing agents in Hong Kong and Macao. Payments between mainland China and Hong Kong/Macao are sent and settled by their intrabank system and HVPS.

NPC has dual hot backup at the active site and another backup system at the passive site.

HVPS operates on business days. One business day is composed of four phases: start of day, business hours, clearing window, and end of day. Business hours are from 08:30 to 17:00. The clearing window opens from 17:00 to 17:30 when necessary for short participants to raise money. End of day processing starts after the clearing window. Each phase of the day can be adjusted when necessary.

3.2.5 Settlement procedures

All interbank payments are settled on reserve accounts (clearing accounts) of commercial banks in the central bank. HVPS will check the balance on the clearing account before debiting the participant. Once the transaction is settled, the payment is final. If the balance of a direct participant is insufficient, its subsequent payments will be queued. From 17:00 to 17:30, the system only handles payment instructions which will supply liquidity to short participants. At 17:30, the system continues to settle net positions which must be settled on the same business day, and returns and cancels unsettled transactions in the queue. At the end of the day, after completing the reconciliation with commercial banks, HVPS sends the statement of every clearing account to the correspondent commercial bank and downloads balances of all the clearing accounts to the Accounting Booking System (ABS).

ABS is distributed in 341 city-level PBC branches. In order to enhance processing efficiency and strengthen liquidity management, PBC has placed all the clearing accounts of the direct participants in HVPS. ABS is connected to HVPS. During the day, HVPS keeps records on all the accounts; at the end of the day, HVPS sends the account balances to ABS.

3.2.6 Risk management

HVPS risks primarily include liquidity risk, credit risk, legal risk and operational risk.

HVPS provides such functions as account inquiry, balance warning, business queuing, clearing window and automatic pledge financing, which help to improve liquidity management. It also takes such measures as business limitation, account balance control and debiting control to strengthen the management of credit risk.

In order to prevent legal risk, PBC has formulated a series of regulations, rules and procedures on payment transaction processing, automatic pledge financing and operational management.

Many measures have been taken to ensure HVPS runs safely and steadily and avoids risks resulting from technical failures and manual mistakes. The measures include adoption of highly reliable networks and computers, encryption in communications and business, checks on instruction format and authority, checks on balances at the end of the day/year, and establishment of a mechanism for dealing with failure and disaster.

3.2.7 Pricing

PBC charges fees to the originating participants, purely to cover operating and maintenance costs in the long run. For every payment transaction, the charge is CNY 5.5. For inquiries, return applications and other non-payment messages, the charge is CNY 1.

3.2.8 Major ongoing and future projects

PBC is developing the second generation of CNAPS. This will support banking institutions in accessing the system from one entry point and adapting to their centralised business processing. It will support the PVP settlement of RMB and foreign currencies in the foreign exchange market to reduce risks. It will support message exchange and settlement of transactions in cross-border RMB payments. It will have such functions as HVPS queue matching, “cash pool” management and automatic lending to cope with liquidity risk. It will also adopt ISO 20022 to promote interoperability between different systems.

3.3 Bulk Electronic Payment System (BEPS)

BEPS deals mainly with local and non-local paper-based debit payments as well as low-value credit transfers below a given value. In June 2006, BEPS was put into operation nationwide. The system sends payment instructions in bulk, nets in real time and settles at regular times.

3.3.1 Institutional framework

PBC has promulgated *Measures for Processing of BEPS Business*, *Procedures for Processing of BEPS Business*, *Measures for Administration on Pledge Financing of BEPS Business* and *Measures for Operational Administration on China National Advanced Payment System* to regulate rights, obligations and responsibilities of the parties concerned.

At the end of 2010, BEPS had 1,730 direct participants, 100,510 indirect participants and 16 chartered participants.

3.3.2 Participation

Participants in BEPS are divided into direct, indirect and chartered participants.

Direct participants include the commercial banks and the city-level branches of PBC which have opened clearing accounts in PBC,⁸ and are linked directly to BEPS.

Indirect participants are the commercial banks and county-level branches of PBC which have no access to BEPS and thus entrust direct participants to submit and receive interbank payments.

⁸ With the approval of PBC.

Chartered participants are approved by PBC to have direct access to the payment system as a third party. At present, the chartered participants of BEPS mainly include centralised collection and payment centres.

3.3.3 Types of transactions

BEPS can process seven types of basic transaction: ordinary credit, periodic credit, real-time credit, ordinary debit, direct debit, real-time debit and information service. At present, the ceiling on ordinary credit and standing order transactions handled by BEPS is CNY 50,000; there is no ceiling for other payment transactions.

3.3.4 Operation of the system

BEPS and HVPS operate on the same technical platform and share the same mainframe, communication network, basic data storage and clearing accounts.

The transactions of BEPS are processed on two levels: NPC and CCPCs. NPC receives and forwards payment transactions and information, nets payment transactions across CCPCs, and regularly submits the net amounts to HVPS for settlement. CCPCs receive and forward payment transactions and information, net payment transactions covered by the same CCPC and regularly submit the net amounts to HVPS for settlement.

BEPS runs constantly for 24 hours a day and 7 days a week. The processing cycle of the system runs from 16:00 on T-1 to 16:00 on T. Funds are settled between 8:30 and 17:00 on business days of HVPS. PBC may adjust the business days and settlement days of BEPS when necessary.

3.3.5 Netting and settlement

BEPS provides periodic settlement on financial institutions' accounts for the net balance of payment transactions. NPC and CCPCs conduct real-time bilateral netting of transactions within the net debit cap. They submit the netting positions to HVPS for settlement at the designated time. Once the transaction is netted, the payment is final and irrevocable.

3.3.6 Risk management

BEPS risks primarily include liquidity risk, credit risk, legal risk and operational risk. In order to prevent liquidity risk, BEPS provides functions such as netting queuing, adjustment of the net debit cap and matching of queuing transactions.

To strengthen credit risk management, BEPS shares the same clearing accounts system with HVPS, and is also designed to have the central bank as the central counterparty and set a net debit cap for all direct participants. Only payments within the net debit cap can be netted. Otherwise, they will be queued. Where the net debit cap is guaranteed by collateral and earmarked funds, if a direct participant presents a credit risk and is unable to settle its net debit position, PBC can take the collateral and earmarked funds.

PBC has formulated a series of rules and procedures on payment transaction processing, collateral management and operational management.

Many measures have been taken to ensure BEPS safety and reliability and avoid risks resulting from technical failures and manual mistakes. The measures include adoption of highly reliable networks and computers, encryption of communications and business, checks on instruction format and authority, equivalence checks on balances at the end of the day/year, and establishment of a mechanism for dealing with failure and disaster.

3.3.7 Pricing

PBC charges fees to the originating participants, purely to cover operating and maintenance costs. Differentiated charging rates are applied to local and inter-province payment transactions. The charge for inter-province payments is 1.5 times that for local payments. To adjust the peak volume of the system and balance the volume in different time periods, PBC also sets different rates by processing time. At present, for every payment transaction by BEPS, PBC charges from CNY 0.03 to 1.25. For non-payment messages, the rate charged differs by data flow, ranging from CNY 0.01/kb to CNY 1/kb.

3.3.8 Development of the new-generation payment system

See Section 3.2.8.

3.4 Internet Banking Payment System (IBPS)

IBPS mainly handles interbank retail payment transactions via the internet, enabling customers to submit online payments and obtain results in real time. IBPS has been put into operation nationwide since August 2010.

3.4.1 Institutional framework

PBC has promulgated *Measures for Processing of IBPS Business*, *Procedures for Processing of IBPS Business*, and *Measures for Operational Administration on IBPS* to clarify rights, obligations and responsibilities of the parties concerned. At the end of 2010, 120 commercial banks had access to IBPS, mainly covering all the commercial banks that have launched internet banking services.

3.4.2 Participation

IBPS has direct and indirect participants. Direct participants are banking institutions with direct access to the system.

Banking institutions with direct access are commercial banks which have RMB reserve accounts with PBC, and are linked directly to IBPS. Other banking institutions can entrust direct participants with the submission/receipt of payments.

3.4.3 Types of transactions

IBPS mainly handles internet credit and debit transfers initiated by commercial banks.

3.4.4 Operation of the system

The internet banking systems of commercial banks approved by PBC are connected directly to IBPS from one entry point.

IBPS offers service around the clock. Its operation cycle can be adjusted and is consistent with BEPS. Since the system allows participants to access IBPS via one entry point, the netting of all transactions is processed in NPC.

3.4.5 Settlement procedures

IBPS shares the net debit cap with BEPS and the same clearing accounts system with HVPS. It complies with the same rules as BEPS in terms of transactions netting and funds settlement.

3.4.6 Risk management

The IBPS risks primarily include liquidity risk, credit risk, legal risk and operational risk.

IBPS takes PBC as its counterparty, and controls credit risk by setting a net debit cap for direct participants. The liquidity risk management is the same as that of HVPS. PBC has formulated business processing rules and procedures to prevent legal risk. IBPS ensures the system runs safely, reliably and continuously by setting business limitation, strengthening network and data security, improving operation and maintenance, and establishing a sound disaster recovery mechanism.

3.4.7 Pricing

At present, PBC does not charge fees to direct participants.

3.5 Local clearing systems

Local clearing systems conduct centralised exchange and netting of local electronic payments and paper-based instruments such as cheques, promissory notes and bank drafts that cannot be truncated.

3.5.1 Institutional framework

A majority of local clearing systems are owned by PBC (see Section 1.2.2) and a minority of them are jointly owned by their members (see Section 1.3.2.4). PBC or the members have formulated rules and procedures on the administration of local clearing systems and their operation to clarify the rights, obligations and responsibilities of the parties concerned.

3.5.2 Participation

The participants in local clearing systems are mostly banking institutions, accounting and treasury departments of PBC branches, and other institutions approved by PBC.

3.5.3 Types of transactions

Local clearing systems process debit and credit transactions. Debits mainly include cheques, promissory notes, drafts and bill collections, while credits primarily include pay-in slips, entrusted payment vouchers and tax payment (rebate) vouchers.

3.5.4 Operation of the system

Local clearing systems have three processing modes: (1) traditional manual processing; (2) computerised processing, ie a banking institution carries both paper vouchers and their magnetic copy which stores relevant data, or transmits the data to the clearing house; the clearing house sorts paper vouchers, automatically calculates and prints netting results, and then gives them to the relevant participants; and (3) bill sorter mode, ie clearing houses automatically sort the vouchers, read payment data and calculate the net amount to be paid or received by each participant.

In cities with very high payment volumes, clearing houses have to exchange vouchers twice a day. In small cities and counties, clearing houses normally exchange vouchers once a day.

3.5.5 Settlement procedures

Local clearing systems submit the results to the accounting department of PBC branches or designated commercial banks for funds settlement. If the net amount is posted on a clearing account, branches submit the net amount of that direct participant to HVPS for settlement.

3.5.6 Risk management

Participants must have a sufficient balance on their accounts to pay their net debit positions. If a participant has insufficient funds to cover the debit position within the due period, PBC will provide overnight pledge financing. If a participant does not have enough collateral, PBC will provide high penalty interest loans. If a participant fails to make up the short position from time to time, it will be forced to quit the local clearing system.

3.5.7 Pricing

Local clearing houses are non-profit-oriented institutions. Nevertheless, their participants jointly bear the operational costs. Fees are charged in three modes: 1) by transaction volumes; 2) an annual fee from each participant; or 3) both of the above.

3.6 Cheque Image System (CIS)

CIS is a cheque truncation system supporting the use of cheques nationwide. It converts physical cheques into images, and then transmits the cheque image and related information to the drawer's bank. The system was launched in June 2007.

3.6.1 Institutional framework

PBC has promulgated the *Processing Measures for CIS Business*, the *Processing Procedures of CIS Business*, the *Administrative Measures for Operation of CIS* and *Administrative Measures for Digital Certificates* to define the rights, obligations and responsibilities of the parties concerned. CIS is owned and operated by PBC.

3.6.2 Participation

Participants include banking institutions and local clearing houses. The local clearing houses can process transactions on behalf of local banking institutions. The banking institutions can also connect to CIS directly if they perform centralised processing of internal transactions and are qualified for image capture. At the end of 2010, there were 59,548 participants.

3.6.3 Types of transactions

CIS primarily processes the inter-city image information of cheques with a value of less than CNY 500,000.

3.6.4 Operation of the system

CIS operates 24 hours a day, 7 days a week. It sets a processing cycle for each transaction; participants return an acknowledgment of receiving the image, and meanwhile send a return receipt of the ordinary debit to BEPS for funds clearing and settlement. At 16:00 every day, CIS marks transactions without the returned receipts within the specified period as overdue.

3.6.5 Settlement procedures

At present, the clearing and settlement of truncated cheques is processed by BEPS.

3.6.6 Risk management

PBC has formulated CIS transaction processing rules and procedures to prevent legal risk. In order to reduce operational risk, CIS uses digital authentication technology to ensure the security of information transmission. PBC requires that cheques above a certain amount be

exchanged with the payer's bank. Any transaction in excess of CNY 500,000 will be rejected by the system.

3.6.7 Pricing

CIS does not apply any charges for the time being. Local clearing houses can charge banking institutions connected; the standards are determined by PBC branches.

3.7 China Domestic Foreign Currency Payment System (CDFCPS)

CDFCPS is an RTGS system developed by PBC for the foreign currency payments incurred by domestic purchases of goods and services. It was put into operation at the end of April 2008. CDFCPS can process payments in eight currencies: USD, HKD, GBP, EUR, JPY, CAD, CHF and AUD. It does not involve foreign exchange transactions.

3.7.1 Institutional framework

Rules and regulations on CDFCPS include mainly the *Administrative Measures for China Domestic Foreign Currency Payment System*, the *Rules on the Administration of Settlement Agents of China Domestic Foreign Currency Payment System*, the *Rules on Operation of China Domestic Foreign Currency Payment System*, the *Rules on Business Processing of China Domestic Foreign Currency Payment System*, and the *Emergency Management Plan of China Domestic Foreign Currency Payment System*. PBC inspects and supervises the participants, chartered participants, settlement agents and CNCC according to law.

CDFCPS consists of the foreign currency clearing system and the system of settlement agents. The clearing system is developed and owned by PBC, while the systems of settlement agents are developed and owned by themselves.

3.7.2 Participation

Participants can be divided into direct participants and chartered participants. There were 31 participants at the end of 2010.

Direct participants open foreign currency accounts with the settlement agents. Chartered participants are foreign currency clearing institutions which have joined CDFCPS but have not opened accounts with settlement agents.

3.7.3 Types of transactions

At present, the main type of transaction is interbank credit transfer.

3.7.4 Operation of the system

CDFCPS operates in normal circumstances from 9:00 to 17:00 on business days. If a participant is short of funds at 17:00, the system will open a clearing window from 17:00 to 17:30. If there is no need to open the window, the system will switchover to next business day. PBC may adjust the business days and business hours of CDFCPS if necessary.

3.7.5 Settlement procedures

CDFCPS is an RTGS system. It adopts a Y-shaped information flow structure, where CNCC receives, clears and transmits payment instructions, and settlement agents are responsible for the settlement of related foreign currency payment instructions.

Settlement agents are commercial banks approved by PBC with a term of three years.

3.7.6 Risk management

CDFCPS has no credit risk but liquidity risk. Therefore, it has a queue management system, matching mechanism and clearing window. It also enables participants to inquire about their queued payment instructions and available account balance. Besides, settlement agents provide daylight financing, overnight financing and other liquidity mechanisms to participants.

Participants must be legal persons. The clearing system of CDFCPS has dual hot backups to ensure continuous processing. Encrypted algorithm and cipher codes are applied to ensure the safety of data. An emergency management plan, audit trail and virus prevention mechanisms have been applied. The internal control mechanism has been developed to prevent maloperation, operational errors and internal fraud.

3.7.7 Pricing

Participants pay for the clearing and settlement service. Payment for the former is based on the principle of cost coverage, while the latter is charged according to the agreement between the participants and the settlement agents based on market-oriented principles.

4. Systems for post-trade processing, clearing and securities settlement

4.1 General overview

At present, China's bond market comprises the interbank bond market – an OTC market – and the exchange bond market, with the former dominating. The bond transfer mechanism has been established between the two markets. Trades from the interbank bond market are settled via CCDC and SHCH and trades from the exchange bond market are cleared and settled via SD&C.

CCDC is a nationwide non-bank financial institution, which provides services such as issuance, registration, custody, settlement, redemption and information products for the bond market.

SHCH provides clearing and settlement, together with registration and depository services for spot and derivative transactions in the interbank market. SHCH provides a centralised clearing service in RMB and foreign currencies as well as for cross-border transactions in RMB approved by PBC.

SD&C provides stock exchange markets with such services as centralised registration, custody, clearing and settlement. It delivers multilateral netting services as a central counterparty, as well as securities and funds settlement services as an operator of the securities clearing and settlement system.

4.2 Central counterparties and clearing systems

4.2.1 SD&C securities clearing system

SD&C serves as central counterparty (CCP) to provide multilateral netting of transactions in securities traded on the stock exchanges.

4.2.1.1 Institutional framework

The *Securities Law*, the *Measures for the Administration of Securities Registration and Settlement (Measures)* and related business rules of SD&C form the legal framework for securities clearing. According to the *Securities Law*, SD&C is responsible for providing

centralised clearing services for transactions in securities listed on the stock exchanges and subject to the supervision and administration of CSRC. The *Measures* specify the system of “two-tiered settlement” for securities transactions and clarify the role of SD&C as CCP, emphasising the netting arrangement and DVP settlement.

The Shanghai and Shenzhen stock exchanges each hold 50% of the shares in SD&C.

4.2.1.2 Participation

Domestic securities operation institutions that have the status of a legal person may apply to be clearing and settlement participants. Participants are divided into Class-A participants and Class-B participants. Class-A participants may conduct clearing and settlement for their own trades as well as for other institutions. Class-B participants can only conduct clearing and settlement for their own trades. At the end of 2010, 106 securities companies were SD&C participants.

4.2.1.3 Types of transactions

SD&C provides clearing services for transactions in securities listed on the Shanghai and Shenzhen stock exchanges, including stocks, funds, warrants, treasury bonds, local government bonds, corporate bonds and convertible bonds.

4.2.1.4 Operation of the system

SD&C directly receives transaction information from the trading systems, and achieves straight through processing (STP) from trading to clearing by connecting its registration, clearing and settlement system with the trading systems of the Shanghai and Shenzhen stock exchanges.

SD&C receives A-share transaction data from exchanges and conducts clearing after the exchange market closes at 15:00, and then sends the clearing results to participants at the end of the trading day.

4.2.1.5 Risk management

According to the *Securities Law*, SD&C shall have necessary service facilities and sound data security protection measures, and establish business, financial and security management rules and risk management systems to ensure normal business operation.

The following measures are adopted by SD&C to prevent settlement risks. First, SD&C requires participants to pay a certain proportion of their average daily buying amount in the previous month and deposit the funds in the settlement reserve account with SD&C. Second, the trades are settled by DVP. Third, SD&C applies for a credit line from commercial banks to prevent liquidity risk. Fourth, in case any member defaults, SD&C may close out the outstanding position, sell out its collateral, suspend the purchase rights to securities of the defaulting member and impose a penalty etc, following the default management procedures. Fifth, SD&C has set up a guarantee fund for the continuity of settlement in case of a participant's default. SD&C and its participants contribute to the securities settlement risk fund required by CSRC and MOF.

4.2.1.6 Links to other systems

At present, SD&C does not connect with other clearing systems.

4.2.1.7 Pricing

SD&C does not collect fees for clearing and settlement services separately. It mainly charges related settlement fees according to a certain proportion of the number or amount of securities transferred.

When changing major fee items and standards for securities registration, clearing and settlement, SD&C is obliged to consult participants in advance. It also has to obtain the approval of the authorities.

4.2.1.8 Major ongoing and future projects

In light of the assessment of China's securities settlement system in the Financial Sector Assessment Program in 2010 and the new international standards for financial market infrastructure, SD&C intends to enhance a lot of features.⁹

4.2.2 SHCH clearing system

The SHCH business system consists of a clearing system, together with a registration and settlement system. SHCH started to provide clearing, settlement, registration and depository services for innovative products such as CRMW and SCP in late 2010.

4.2.2.1 Institutional framework

SHCH is licensed, regulated and overseen by PBC.

4.2.2.2 Participation

Participants in the interbank market can apply for SHCH membership. They can be divided into direct and indirect clearing members. Direct clearing members need to open an account in SHCH. Indirect clearing members need to entrust direct members to fulfil settlement.

4.2.2.3 Types of services

SHCH provides a gross clearing service for investors in CRMW and SCP. Also, it is designing and developing the netting service for RMB and foreign currency spot transactions.

4.2.2.4 Operation of the system

SHCH business systems operate 09:00–17:00 every trading day in the interbank market. The clearing system receives trading data on a real-time basis, and clears the data confirmed by participants. After clearing, the clearing system generates funds and securities settlement instructions. Then the securities settlement instructions are sent to the SHCH registration and settlement system. Funds settlement instructions are handled by HVPS or the designated settlement banks.

4.2.2.5 Risk management

SHCH is formulating rules and procedures for risk management, such as clearing member qualification, monitoring credit risk of clearing members, credit limits, margin, marking to market, a clearing fund, a risk prevention reserve, and default arrangements.

4.2.2.6 Links to other systems

SHCH business systems are externally connected to the trading system of the China Foreign Exchange Trading System (CFETS) and HVPS. The clearing system is internally integrated and seamlessly connected with its registration and settlement system.

⁹ Measures include strengthening the management of credit and liquidity risks and arrangements for default treatment, ensuring sophisticated and scientific management of settlement risks, and guaranteeing the soundness of the settlement infrastructure.

4.2.2.7 Pricing

SHCH collects clearing fees based on its charging items and standard.

4.3 Securities settlement systems

4.3.1 CCDC Central Bond Generalized System (CBGS)

CBGS is owned and operated by CCDC, and its primary purpose is the registration, custody and settlement of bonds in the interbank bond market. The par value of bonds settled¹⁰ has shown a significant growth trend and exceeded CNY 160 trillion (USD 24 trillion) in 2010. In 2010, the total value of bonds issued in CBGS reached CNY 9.51 trillion (USD 1.40 trillion).

4.3.1.1 Institutional framework

CCDC provides bond registration, custody and settlement business primarily based on such laws, regulations and rules as the *Law on the People's Bank of China*, the *Administrative Measures for Bond Transactions in the National Interbank Bond Market*, the *Administrative Measures for Registration, Depository and Settlement of Bonds in the Interbank Bond Market* formulated by PBC, the *Interim Measures for the Administration of Depository of Treasury Bonds of the People's Republic of China*, the *Administrative Measures for Cross-Market Transfer Depository of Treasury Bonds* formulated by the MOF, and the *Administrative Measures for (Electronic) Savings Treasury Bonds (Trial)* jointly promulgated by the MOF and PBC. CCDC has formulated a set of rules and procedures and signed agreements with market participants. These rules and agreements also constitute an important part of the institutional framework.

4.3.1.2 Participation

All settlement members of CCDC are institutional investors. Among them, domestic settlement members include commercial banks,¹¹ policy banks, credit cooperatives, securities companies, insurance companies, finance companies, trust companies, fund management companies, financial asset management companies, financial lease companies and automobile finance companies. Non-financial institutions¹² and non-legal-person institutional investors¹³ are also included. Overseas settlement members are overseas central banks or monetary authorities authorised by PBC to enter China's interbank bond market, RMB business clearing banks in Hong Kong and Macao and overseas participating banks of cross-border trade settlement in RMB.

CCDC settlement members are divided into classes A, B and C. Class-A settlement members have a direct connection with the Central Bond Bookkeeping System (CBBS) of CCDC. Apart from proprietary account settlement, Class-A members may apply to open Class-C accounts with CCDC and make settlements for their customers. Class-C members can inquire about their balance at any time, and reconcile with the settlement agents (Class-A settlement members). Class-B members can only settle their proprietary transactions through a direct connection with CBBS.

Class-A membership is limited to the head offices of commercial banks that are registered in mainland China and have been qualified as settlement agents by PBC.

¹⁰ The par value of bonds settled excludes the second leg of repo transactions.

¹¹ Including headquarters and authorised branches.

¹² Enterprises and institutions.

¹³ Such as funds, trust products, securities asset management plans and insurance products.

Class-B membership is limited to financial institutions and non-legal-person institutional investors registered in mainland China.

Class-C membership is limited to non-financial institutions with legal person status and non-legal-person investors registered in mainland China.

Among the three classes of overseas institutions eligible to trade in the interbank bond market, overseas central banks or monetary authorities and RMB business clearing banks in Hong Kong and Macao may apply for Class-B or Class-C membership. Overseas banks participating in cross-border trade settlement in RMB may apply for Class-C membership.

4.3.1.3 *Types of transactions*

CBGS can process several types of bond transactions, such as: cash transactions, bond forwards, pledged repos, outright repos, bond lending, and pledged financing for HVPS and BEPS participants, Treasury cash management, open market operation transactions, etc.

4.3.1.4 *Operation of the system*

Settlement confirmation

If two members negotiate a transaction through the trading system of CFETS, trade data will be sent in real time from the trading system to CBGS. Upon receiving the trade data, CBGS will check its validity and send settlement instructions to both parties for confirmation. The transaction can be settled only after confirmation.

If two members negotiate a transaction by themselves, one party inputs settlement instruction into CBGS. Upon receiving the instruction, CBGS will send it to the other party for confirmation, after which the transaction can be settled.

STP capability

Through its connection with the CFETS system, CCDG can use STP from transactions to settlements, which helps to control settlement risk and improve settlement efficiency.

Settlement cycle and system operation time

The bond settlements between interbank bond market participants are settled on a trade for trade basis in real time on predetermined dates. The settlement cycle can be T+0 or T+1. Bond settlement among participants of the interbank bond market is completed via CBGS from 9:00 to 17:00 every business day. It should be noted that the system's operation time is related to that of HVPS.

4.3.1.5 *Cash-leg settlement process*

There are four settlement modes in CBGS: *Free of payment (FOP)*, *Payment after delivery (PAD)*, *Delivery after payment (DAP)* and *Delivery versus payment (DVP)*. DVP is the main settlement mode in the interbank bond market. At present, it can be achieved by the following approaches.

One option is via direct link between CBGS and HVPS, which is applicable to the commercial banks with clearing accounts in HVPS. CCDG will act as third party to send a transfer message to HVPS for cash-leg settlement and meanwhile completes the transfer of bonds.

The other option to achieve DVP settlement is via the CCDG funds account system. CCDG holds a chartered account in HVPS and opens fund settlement accounts for non-banking institutions under the chartered account in HVPS. This approach is applicable to non-banking institutions without clearing accounts in HVPS. The bond buyer transfers its funds to the

chartered account. If the bond seller has sufficient bonds, CCDC will transfer the funds to the seller via HVPS, concurrently completing the transfer of bonds.

4.3.1.6 Custody function

CCDC handles bond registration and custody in accordance with regulations related to bond issuance and transaction. It takes care of settlement and transfer, custodian transfer, negotiated transfer and non-trade transfer of bonds. It maintains bond accounts according to the entrustment of bond holders. In addition, it handles bond redemption and payment of interest and commission.

4.3.1.7 Risk management

To reduce legal risks, a series of regulations, rules and agreements has been formulated. Based on the central depository system, dematerialisation has been achieved to mitigate custody risks. After matching and confirmation of transaction orders, settlements will be completed on a trade-for-trade, real-time basis through CBBS, which can prevent operational mistakes. Moreover, the internal audit can reduce operational risk and moral hazard effectively.

Liquidity risk has been reduced through the connection with HVPS and by providing pledged financing mechanisms for members. DVP settlement reduces credit risk and eliminates principal risk. Collateral management helps reduce replacement risk.

The system uses a two-way authentication mechanism and operation authorisation to ensure the uniqueness of settlement members. It also implements encrypted algorithm and cipher codes to maintain the integrity of transaction data. The emergency settlement mechanism can ensure business continuity under circumstances of system malfunctioning. In order to improve the reliability of hardware, the system has adopted dual hot backups on the mainframe and redundant backup on telecommunication devices. A disaster recovery mechanism and an inter-city disaster recovery centre have been developed.

4.3.1.8 Links to other systems

CCDC signed a bond settlement agreement with HKMA in 2004. The cooperation includes a one-way connection with the Central Moneymarkets Unit (CMU) of HKMA and provides an alternative cross-border settlement channel for domestic financial institutions that are qualified to participate in bond investment in Hong Kong.

CCDC also signed a cross-border settlement agreement with Clearstream Bank in 2007 to provide an alternative settlement channel for domestic qualified financial institutions to participate in bond investment on the international market.

4.3.1.9 Commercial bank counter market business system

The commercial banks counter market business system is a subsystem of CBGS, serving the commercial bank counter market with treasury bonds as the main product. The treasury bond is an important investment instrument for small and medium-sized enterprises and individuals. At the end of 2010, there were 8.95 million accounts in the commercial bank counter market, covering 80,000 business outlets of 40 commercial banks.

Trading

Qualified commercial banks can sell bonds through their counters, and submit bid/ask prices on each business day for individuals and entities. Investors can conduct subscription, buying and selling, repo and other transactions through the bank's network.

Qualified banks must submit quotation data to CCDC on a daily basis, and release the information on www.chinabond.com.cn.

Custody

The commercial bank counter market operates a two-tier custody system, in which CCDC is the first-tier custodian and opens general agency accounts for qualified banks. Qualified banks act as the second-tier custodians and can directly open custody accounts for investors. CCDC reconciles the agent accounts with second-tier custody accounts. It provides voice inquiry services to investors for balance checking. Investors can also inquire about their accounts through the qualified banks.

Settlement

Treasury bond transactions are settled through qualified banks in real time. At the end of a trade day, the banks sum up the data and transmit it to the commercial bank counter market business system. The system reconciles the data and calculates the net trading amount of each bank. The bank sends settlement instructions to CBGS after confirmation, and CBGS transfers bonds between the bank's agency account and proprietary account.

4.3.2 SHCH registration and settlement system

SHCH provides participants in the interbank bond market with registration and settlement services for CRMW and SCP subject to the regulation of PBC.

4.3.2.1 Institutional framework

See Section 4.2.2.1.

4.3.2.2 Participation

See Section 4.2.2.2.

4.3.2.3 Types of services

The system can provide a full range of registration and depository services for fixed income products, money market instruments and standardised financial derivatives, including registration, underwriting, distribution, interest payment and pledging. The main settlement method is DVP, complemented by PAD, DAP and FOP.

4.3.2.4 Operation of the system

The system conducts product settlement and transfers based on the settlement instructions sent by its clearing system and completes its fund transfers via HVPS.

4.3.2.5 Risk management

SHCH prevents operational risks through rules and technology. In terms of systems, it has formulated business rules, an operation guide, internal operation rules and emergency systems. It organises business publicity activities and trainings on a regular basis. In terms of technology, SHCH has introduced such measures as monitoring business system operation and dual backup of data.

4.3.2.6 Links to other systems

See Section 4.2.2.6.

4.3.2.7 Pricing

SHCH collects registration and settlement fees based on its charging schedule and standards.

4.3.3 SD&C securities settlement system

SD&C provides centralised securities depository and settlement services in stock markets.

4.3.3.1 Institutional framework

See Section 4.2.1.1.

4.3.3.2 Participation

See Section 4.2.1.2.

4.3.3.3 Types of transactions

The securities settlement system of SD&C provides settlement services for transactions in securities listed on the Shanghai and Shenzhen stock exchanges, concerning stocks, funds, warrants, treasury bonds, local government bonds, corporate bonds and convertible bonds, etc.

4.3.3.4 Operation of the system

The settlement cycle of A shares, funds, bonds and warrants is T+1, and that of B shares is T+3.

The settlement of securities and funds takes place on the principle of DVP and “two-tiered settlement”. SD&C is responsible for the centralised settlement of securities and funds with participants. Participants are responsible for the settlement of funds with their customers, while the securities settlement between participants and their customers is entrusted to SD&C.

4.3.3.5 Cash-leg settlement process

The funds settlement between SD&C and participants uses commercial bank money, and is handled by the 19 commercial banks as qualified settlement banks. The funds settlement involving A shares and B shares of domestic participants is completed through their settlement reserve accounts with SD&C; the funds settlement involving B shares of overseas participants is completed through their accounts with correspondent settlement banks.

With regard to A shares, SD&C calculates the net amount of each participant on day T, and notifies net debtor participants. Net debtors must deposit enough funds in their settlement reserve accounts before 16:00 on T+1. At 16:00 on T+1, SD&C transfers the funds to the settlement reserve accounts of net creditor participants. The funds settlement between participants and their customers is handled by participants themselves.

With regard to B shares, SD&C notifies participants of their net amount on T+1 for confirmation. On T+3, for domestic participants, SD&C completes funds transfer through the settlement reserve accounts of participants. For overseas participants, net debtor participants first remit the payable funds to the SD&C's accounts with settlement banks, and then SD&C notifies settlement banks to remit the funds to the net creditors' accounts.

4.3.3.6 Custody function

SD&C is a central securities depository. It can open securities accounts for investors either directly or entrust securities companies.

As a registry, SD&C maintains the register of stockholders and provides corporate action services for issuers. The stock market operates a direct holding model, that is, most stocks are registered under the name of beneficial owners. However, nominees are also allowed according to pertinent laws and regulations.

4.3.3.7 Risk management

In terms of securities settlement, the stock market operates a direct holding model. Based on the shareholding information, the trading system applies such arrangements as front-end restriction on short-selling, that is, technically ensuring the investor has enough securities when he sells out the securities, furthermore ensuring the securities company will not fail to complete securities settlement.

In respect of funds settlement, an investor who submits a buying order to a securities company must have trading margin deposited in full with the company. In order to prevent misappropriation of customers' funds by securities companies, customers' trading margin kept by securities companies must be deposited in commercial banks. The practice was launched in 2006 and is referred to as third-party custody of customers' trading funds. The margin is only allowed to be used for funds settlement. The commercial bank updates customer details and margin balances on a daily basis, and provides them to investors upon inquiry.

SD&C has established business continuity arrangements and an internal control mechanism to reduce operational risks.

4.3.3.8 Pricing

See Section 4.2.1.7.

4.3.3.9 Major ongoing and future projects

See Section 4.2.1.8.

4.4 Use of securities infrastructure by the central bank

PBC provides liquidity through the securities infrastructure to primary traders in the financial market and direct participants of HVPS and BEPS.

PBC, as collateral taker, mainly engages in reverse repos, whereby a primary trader provides eligible collateral such as treasury bonds, financial bonds and central bank bills to PBC for funding. PBC also provides a credit facility via an automatic pledge financing system to direct participants of HVPS and BEPS. The direct participants can finance themselves against eligible bonds under the custody of CCDC, such as treasury bonds, and policy financial bonds issued by such institutions as governments, PBC and policy banks.

In the automatic pledge financing system, PBC can set the parameters such as the floor of par value of pledged bonds, the cap of pledge financing for direct participants of HVPS and BEPS, the minimum amount of single financing, the threshold for triggering pledge financing, the total amount of pledge financing for all participants, the bond pledged rate, the interest-free proportion and the repayment schedule.

**Payment, clearing and
settlement systems in
the euro area**

Contents

Introduction.....	67
1. Institutional aspects	69
1.1 The general institutional background	69
1.1.1 The Eurosystem	69
1.1.2 The Council of the European Union and the European Parliament	69
1.1.3 The European Commission	69
1.1.4 The European Systemic Risk Board	70
1.1.5 The European Supervisory Authorities	70
1.2 Major payment system-related legal acts.....	71
1.2.1 The Settlement Finality Directive	71
1.2.2 The Financial Collateral Directive	72
1.2.3 The Markets in Financial Instruments Directive	72
1.2.4 The Winding-up Directive	72
1.2.5 The Payment Services Directive.....	73
1.2.6 The Regulation on cross-border payments in the Community.....	73
1.2.7 Regulation on information on the payer accompanying transfer of funds..	74
1.2.8 The E-Money Directive	74
1.2.9 Legislative initiatives	75
1.3 The role of the Eurosystem.....	75
1.3.1 The Eurosystem's operational role	76
1.3.2 The Eurosystem's oversight role.....	76
1.3.3 The Eurosystem's catalyst role.....	78
1.3.4 Cooperation with other institutions.....	80
1.3.5 The role of other private and public sector bodies.....	82
2. Payment media used by non-banks.....	83
2.1 Cash payments.....	83
2.2 Non-cash payments.....	83
2.2.1 Non-cash payment instruments	83
2.2.2 The migration to SEPA instruments	85
2.2.3 Future developments.....	88
2.2.4 Multilateral interchange fees.....	89
3. Payment systems	89
3.1 General overview.....	89
3.1.1 Large-value payments	89

3.1.2	Retail payments: Single Euro Payments Area for infrastructure, processors and links	90
3.1.3	Card schemes	91
3.1.4	Correspondent banking and group networks	93
3.2	Large-value payment systems	93
3.2.1	TARGET2: the real-time gross settlement system	93
3.2.2	The EURO1 system.....	98
3.2.3	Continuous Linked Settlement	103
3.3	Retail payment systems.....	104
3.3.1	The STEP1 system.....	104
3.3.2	The STEP2 system.....	105
4.	Systems for post-trade processing, clearing and settlement of securities and derivatives	108
4.1	General overview.....	108
4.1.1	Towards more integration	108
4.1.2	Trading and post-trade processing	109
4.1.3	The clearing landscape.....	110
4.1.4	Securities settlement	111
4.2	The REGIS-TR trade repository.....	111
4.2.1	Institutional framework.....	111
4.2.2	REGIS-TR participation and types of transaction.....	111
4.2.3	Operation of the system.....	112
4.3	Central counterparties and clearing systems	112
4.3.1	LCH.Clearnet SA.....	112
4.3.2	Eurex Clearing.....	115
4.3.3	European Multilateral Clearing Facility.....	116
4.3.4	European Commodity Clearing AG.....	116
4.4	Securities settlement	117
4.4.1	Euroclear Group	117
4.4.2	ESES securities settlement systems.....	120
4.4.3	Clearstream Group	122
4.4.4	The correspondent central banking model (CCBM)	123
4.4.5	Major project: TARGET2-Securities.....	127
4.5	Use of the securities infrastructure by the Eurosystem.....	132
4.5.1	General information	132
4.5.2	User assessments of SSSs and links by the Eurosystem	132

List of abbreviations

ACH	automated clearing house
ATM	automated teller machine
BaFin	Bundesanstalt für Finanzdienstleistungsaufsicht – Federal Financial Supervisory Authority (Germany)
BIC	Business Identifier Code
CCB	correspondent central bank
CCBM	correspondent central banking model
CCP	central counterparty
CESR	Committee of European Securities Regulators
CET	Central European Time
CLS	Continuous Linked Settlement
COGEPS	Contact Group on Euro Payments Strategy
COGESI	Contact Group on Euro Securities Infrastructures
CPSS	Committee on Payment and Settlement Systems
CSD	central securities depository
CSM	clearing and settlement mechanism
DVP	delivery versus payment
EACB	European Association of Co-operative Banks
EACH	European Association of Central Counterparty Clearing Houses
EACHA	European Automated Clearing House Association
EBA	Euro Banking Association
EBF	European Banking Federation
ECB	European Central Bank
ECC	European Commodity Clearing AG
ECSDA	European Central Securities Depositories Association
EEA	European Economic Area
EMCF	European Multilateral Clearing Facility NV
EMIR	European Market Infrastructure Regulation
EMU	Economic and Monetary Union
EMV	Europay/MasterCard/Visa integrated circuit card standard
EPC	European Payments Council
ESAs	European Supervisory Authorities
ESBG	European Savings Bank Group
ESCB	European System of Central Banks
ESES	Euroclear Settlement of Euronext-zone Securities

ESMA	European Securities and Markets Authority
ESRB	European Systemic Risk Board
EURO1	multilateral large-value payment system for euro payments set up by the EBA Clearing Company
FESE	Federation of European Securities Exchanges
FOP	free of payment
HCB	home central bank
IBAN	International Bank Account Number
ICM	Information and Control Module of TARGET2
ICSD	international central securities depository
IOSCO	International Organization of Securities Commissions
ISIN	International Securities Identification Number
LVPS	large-value payment system
MIF	multilateral interchange fee
MiFID	Directive 2004/39/EC on markets in financial instruments
MoU	memorandum of understanding
MTF	multilateral trading facility
NCB	national central bank
OJ L	Official Journal of the European Union (Legislation)
OTC	over the counter
PE-ACH	pan-European automated clearing house
POS	point of sale
PSD	Directive 2007/64/EC on payment services in the internal market
PSSC	Payment and Settlement Systems Committee
PVP	payment versus payment
ROCH	Recognised Overseas Clearing House
RTGS	real-time gross settlement
SCF	SEPA Cards Framework
SCT	SEPA Credit Transfer
SDD	SEPA Direct Debit
SEPA	Single Euro Payments Area
SSP	Single Shared Platform of TARGET2
SSS	securities settlement system
STEP1	low-value payments solution operating on the EURO1 platform
STEP2	retail clearing system of the EBA Clearing Company
STP	straight through processing
SWIFT	Society for Worldwide Interbank Financial Telecommunication

T2S	TARGET2-Securities
TARGET2	Trans-European Automated Real-time Gross settlement Express Transfer system, second generation
TFEU	Treaty on the Functioning of the European Union
XML	Extensible Markup Language

Introduction

The European Union constitutes an internal market defined by the “four freedoms”: the free movement of capital, people, goods and services – including financial services. Through the Agreement on the European Economic Area (EEA), the internal market also extends to Iceland, Liechtenstein and Norway. The euro area comprises those EU member states that have adopted the euro as their currency. The euro area is a monetary union with a single currency, a common central bank system (the Eurosystem), a single monetary policy and a common money market. The euro area, like any currency area, requires an infrastructure which enables the safe and efficient flow of payments and financial instruments at low cost throughout the whole zone.

Most of the payment, clearing and settlement infrastructures in the euro area and the broader EU were originally created with the aim of meeting the needs of individual countries. They were rather diverse in nature and not necessarily suited to the needs of an internal market, let alone the needs of a single currency area. Financial integration, globalisation and, in particular, the launch of the euro in 1999 have led to an overhaul and reshaping of the infrastructure for effecting payments and for the trading, clearing and settlement of financial instruments. The introduction of the euro has also furthered efforts to harmonise or consolidate infrastructure.

This chapter describes those market infrastructure components that are common to, or relevant for, all euro area countries and depicts the legal and regulatory environment in which they operate. Emphasis is placed on the role of the Eurosystem, which comprises the European Central Bank (ECB) and the national central banks (NCBs) of all the countries in the euro area. Where necessary, the chapter also describes aspects and features of payment, clearing and settlement systems which are relevant to all EU member states.

The reshaping and consolidation of the infrastructure has been particularly prevalent in the market segment for large-value payments, which is now served by two area-wide systems. The technically centralised TARGET2 system, owned and operated by the Eurosystem, provides for real-time gross settlement of euro payments in central bank money (see Section 3.2.1). It is used for the settlement of central bank operations, interbank transfers and other large-value or urgent euro payments. TARGET2 is an essential vehicle for implementing the ECB’s monetary policy and for the functioning of the euro money market. The EURO1 system of the Euro Banking Association (EBA) is a privately owned and operated EU-wide euro payment system in the large-value segment. EURO1 processes both interbank payments and commercial payments. In addition, large-value euro payments related to foreign exchange transactions are settled in the CLS system. The CLS settles the two legs of foreign exchange transactions on a payment versus payment (PVP) basis in the books of a privately owned, single-purpose bank (CLS Bank).

The process of harmonising, integrating and consolidating retail payments and retail payment systems has not progressed as rapidly as that of the large-value segment and is therefore still at an early stage. As at mid-2011, the euro area is served by two area-wide and 20 national retail payment systems, 25 national card schemes and six international card schemes (where a number of debit card schemes also offer credit card functionality and vice versa). However, this situation is expected to change significantly in the years to come. The Single Euro Payments Area (SEPA) project (see Section 2.2.2) was set up by the banking industry with a view to achieving a fully integrated market for retail payment services in the euro area, with no distinction between cross-border and national payments in euros. The first phase of the SEPA initiative was officially launched in January 2008.

Fragmentation of the market infrastructures for post-trade processing, clearing and settlement of euro financial instruments has resulted in inefficiencies and high costs, especially for cross-border transactions. However, the euro has acted as a major catalyst, promoting efforts to reshape, harmonise and integrate the market infrastructure. The

introduction of the euro eliminated currency segmentation, which was one of the main reasons for the fragmentation of listing, trading, clearing and settlement, and the removal of currency risk allowed increased portfolio diversification within the euro area. The euro has also resulted in markets becoming far larger and more liquid.

In recent years a number of public and private sector initiatives have been proposed and implemented with a view to fostering integration and competition in euro area securities market infrastructures, particularly with the aim of enhancing the interoperability and efficiency of post-trading infrastructures. These include: the Markets in Financial Instruments Directive (MiFID) (see Section 1.2.3); the Code of Conduct for Clearing and Settlement (see Section 1.3.3); the removal of the “Giovannini barriers” (see Section 1.3.3); the recommendations of the European System of Central Banks (ESCB) and the Committee of European Securities Regulators (CESR) for securities settlement systems (SSSs) and central counterparties (CCPs) (see Section 1.3.2); the TARGET2-Securities (T2S) project (see Section 4.4.5); the Collateral Central Bank Management project (see Section 4.4.4.6); and several other legislative initiatives (see Section 1.2).

As regards trading, at the end of 2010 there were 62 regulated markets in the euro area (a stock exchange may provide for several regulated markets) and 51 multilateral trading facilities (MTFs). These markets were served by one trade repository, nine CCPs and 25 central securities depositories (CSDs). The latter operate 23 SSSs eligible in Eurosystem credit operations. There are 57 direct links and seven relayed links between CSDs that are eligible in Eurosystem credit operations.

The Eurosystem’s statutory task of promoting the smooth operation of payment systems means that it has a keen interest in furthering the integration of the euro area market infrastructure for payments and post-trading services for financial instruments. It does so through its complementary roles as operator, overseer and facilitator.

Besides TARGET2, another important Eurosystem service contributing to the integration of the money market is the correspondent central banking model (CCBM). The CCBM allows for the cross-border transfer of collateral within the euro area for Eurosystem credit operations. Moreover, to reduce the complexity and cost of back office operations and to improve liquidity management, the Eurosystem is developing a Collateral Central Bank Management facility in order to provide an enhanced service for both domestic and cross-border collateral operations (see Section 4.4.4.6).

The Eurosystem’s most fundamental contribution to integration is through the building of T2S, a single platform for securities settlement in Europe which will create a borderless market for settlement services (see Section 4.4.5). T2S is a major infrastructure project, initiated by the Eurosystem, which aims to overcome the current fragmentation in the securities settlement layer of the European post-trading landscape. Fragmentation and the existence of procedures that have not been harmonised across national settlement systems contribute to high costs and inefficiencies, especially for cross-border securities transactions, which constitute a considerable competitive disadvantage for European capital markets.

The T2S platform will deliver harmonised and commoditised delivery versus payment (DVP) settlement in central bank money, in euros and other participating currencies, for virtually all securities in Europe. By removing the distinction between cross-border and domestic settlement, T2S will be a major breakthrough in delivering an integrated capital market for Europe, providing a solid basis for increased efficiency and competition in the entire post-trading sector.

1. Institutional aspects

1.1 The general institutional background

1.1.1 The Eurosystem

The Treaty on the Functioning of the European Union (TFEU), notably Title VIII, Chapter 2 on Monetary Policy, and the provisions of the Statute of the ESCB and of the ECB apply to member states of the EU which have adopted the euro, their central banks and the ECB. To distinguish the euro area central banks from those outside the euro area, the name “Eurosystem” has been used since the introduction of the euro in 1999. The Eurosystem therefore consists of the ECB and the NCBs of the countries in the euro area. “ESCB” is used when referring to the ECB and the central banks of all the member states.

A main task of the Eurosystem is to “promote the smooth operation of payment systems” (Articles 127(2) TFEU and 3.1 of the Statute of the ESCB and of the ECB). Article 22 of the Statute empowers the ECB and NCBs to provide facilities, and the ECB to make regulations, to ensure efficient and sound clearing and payment systems within the EU and with other countries.

The decision-making bodies of the Eurosystem are the Executive Board and the Governing Council of the ECB. The Executive Board is composed of six members and is entrusted with implementing the monetary policy of the ECB, preparing the Governing Council meetings and running the ECB’s everyday business. The Governing Council is composed of the six Executive Board members and the governors of the – currently 17 – euro area NCBs. The Governing Council decides upon all matters within the competence of the Eurosystem. The decision-making bodies of the Eurosystem may adopt the legal acts necessary to ensure the performance of the tasks entrusted to the Eurosystem. Legal acts such as regulations, decisions, recommendations and opinions may be addressed to parties other than central banks. Other legal acts in the form of guidelines, instructions and decisions may be addressed to the ECB and Eurosystem central banks.

The General Council comprises the governors of all the NCBs in the 27 EU member states, as well as the President and the Vice-President of the ECB. The General Council deals with matters relating to the ESCB, providing a link between the Eurosystem and the non-euro area central banks, which conduct their monetary policy independently.

1.1.2 The Council of the European Union and the European Parliament

The Council of the European Union and the European Parliament are empowered by the Treaty on European Union to adopt legal acts. These may include rules relating to credit and other financial institutions, the provision of financial services, payments, financial instruments and market infrastructures. The main legal instruments adopted by the Council and the Parliament are directives and regulations. Directives are implemented at the national level by member states and are used to harmonise existing rules or to introduce new legislation where appropriate. Regulations have general application and are directly applicable without requiring implementation by member states.

1.1.3 The European Commission

The European Commission acts as the guardian of the EU’s treaties and has the power to propose legislation to the Parliament and the Council. The Commission works in the interests of the EU as a whole. One of the principal aims is to create a single market with a level playing field and equal opportunities throughout the EU. The following Commission directorates general deal with matters related to payments, the trading, clearing and settlement of financial instruments and market infrastructure issues.

- The main role of the Directorate General Internal Market and Services is to coordinate the Commission's policy on the European single market and to seek the removal of unjustified obstacles to trade, in particular in the field of services and financial markets. One of the tasks of the Commission is to strive for further harmonisation of the laws within the EU, including those which have an impact on payment systems or the development of a single securities market for both new issues and trading of securities.
- The Directorate General for Competition, together with the national competition authorities, directly enforces EU competition rules, Articles 101–109 TFEU, to make EU markets work better, by ensuring that all companies compete equally and fairly on their merits.

1.1.4 The European Systemic Risk Board

The European Systemic Risk Board (ESRB) is an independent body responsible for the macroprudential oversight of the EU financial system. It contributes to the prevention or mitigation of systemic risks to financial stability arising from developments within the financial system so as to avoid periods of widespread financial distress. The ESRB was established by the Council and the European Parliament on the basis of Regulation No 1092/2010 on EU macroprudential oversight of the financial system and establishing a European Systemic Risk Board, and Council Regulation (EU) No 1096/2010 conferring specific tasks upon the ECB concerning the functioning of the European Systemic Risk Board. The two Regulations entered into force on 16 December 2010.¹

The ESRB is in charge of collecting and analysing all the relevant and necessary information, identifying and prioritising systemic risks, and issuing warnings and recommendations for remedial action in response to the risks identified. Warnings and recommendations may be either public or confidential. They may be of a general or a specific nature, and may be addressed to the EU as a whole or to one or more member states, to one or more of the European Supervisory Authorities (ESAs), or to one or more of the national supervisory authorities. Recommendations may also be addressed to the European Commission in respect of the relevant EU legislation.

The structure of the ESRB comprises: the General Board (the sole decision-making body), the Steering Committee (which prepares the meetings of the General Board), two advisory committees (the Advisory Scientific Committee and the Advisory Technical Committee) and the Secretariat.

The ECB ensures the ESRB Secretariat and provides analytical, statistical, logistical and administrative support.

1.1.5 The European Supervisory Authorities

Established on 1 January 2011 by three Regulations dated 24 November 2010² and granted legal personality, the three ESAs – the European Securities and Markets Authority (ESMA), the European Banking Authority and the European Insurance and Occupational Pensions Authority – replace the three so-called “Level-3 Committees”: the Committee of European Securities Regulators (CESR), the Committee of European Banking Supervisors and the Committee of European Insurance and Occupational Pensions Supervisors.

¹ OJ L 331, 15.12.2010, p 1 and OJ L 331, 15.12.2010, p 162.

² OJ L 331, 15.12.2010, p 84; OJ L 331, 15.12.2010, p 12 and OJ L 331, 15.12.2010, p 48.

While responsibility for day-to-day supervision remains with national authorities, the specific prerogatives of the new ESAs have been designed to improve the quality and consistency of supervision, reinforce the supervision of cross-border groups, strengthen crisis prevention and management across the EU, and establish a set of common standards applicable to all financial institutions (“single rule book”).

Each ESA is composed of: (i) a Board of Supervisors, as the principal decision-making body; (ii) a Management Board ensuring that the ESA carries out its mission and performs its tasks; (iii) the Chair and the Executive Director, appointed by the Board of Supervisors; and (iv) a Board of Appeal, which is a joint body of the three ESAs. A Joint Committee has also been established to ensure cross-sectoral consistency in the activities of the ESAs. It is chaired for a 12-month term on a rotating basis by the Chairpersons of the three Authorities.

The ESRB and the ESAs, together with the national supervisory authorities and the Joint Committee of the ESAs, form the European System of Financial Supervisors.

1.2 Major payment system-related legal acts

EU legislation provides for the harmonisation of the legal frameworks of all 27 EU member states (it also extends to the EEA, which, besides the EU 27, comprises Iceland, Liechtenstein and Norway). The main legally binding instruments used by the Council and the European Parliament as the EU’s legislature are Regulations and Directives. These legislative instruments are used to harmonise existing rules at the EU level or to establish new legislation where national rules do not exist but are deemed necessary.

Some of the legal acts and legislative initiatives relevant to the ECB’s sphere of competence are referred to below. The ECB takes a close interest in these legal acts, particularly through its advisory role in the EU’s legislative process.

1.2.1 The Settlement Finality Directive

The Settlement Finality Directive³ has harmonised the laws of the member states so as to ensure the operations of payment and settlement systems, also in case of bankruptcy of a participant, during daytime and night-time settlement. The Directive provides that netting and transfer orders entered into a system prior to the opening of insolvency proceedings against a participant in that system are binding and enforceable against third parties. Collateral in favour of other participants and central banks can be realised in accordance with the terms of the relevant agreement, notwithstanding the opening of insolvency proceedings against the collateral provider. The rights and obligations of participants in connection with the system are subject to the law governing that system. Rights to collateral securities recorded in an account, registry or CSD are governed by the law of the member state where the account, registry or CSD is located. Interoperable systems are required to coordinate the rules on the moment of entry and irrevocability in the systems they operate.

The main achievements of the Settlement Finality Directive are: (i) elimination of the main risks incurred in payment and settlement systems; (ii) smooth functioning of a system even after the application of a foreign insolvency law; and (iii) legal certainty for collateral enforcement (also to the benefit of ESCB credit operations).

³ Directive 98/26/EC of 19 May 1998 on settlement finality in payment and securities settlement systems, OJ L 166, 11.6.1998, pp 45–50, as amended.

1.2.2 The Financial Collateral Directive

The Financial Collateral Directive⁴ has harmonised the laws regarding the provision and enforcement of collateral in the EU. The Directive applies to public sector bodies, central banks and international financial institutions, supervised financial institutions, CCPs, settlement agents and clearing houses regarding collateral in the form of financial instruments, credit claims and cash. The Directive abolishes all formalities for the creation and perfection of collateral. If an enforcement event occurs, the financial collateral will be realised by sale or appropriation (if agreed) of the financial instruments and by setting off the amount or applying it in discharge of the relevant financial obligation. The Directive recognises close-out netting and setoff rights and applies the law of the place where the relevant account is maintained to all collateral in the form of book-entry securities.

The main achievements of the Financial Collateral Directive are: (i) the protection, validity and enforceability of credit claims and collateral agreements, which are to be executed in accordance with their terms also in the event of the opening of insolvency proceedings against a counterparty; (ii) the limitation of administrative burdens, formalities and cumbersome procedures; and (iii) the creation of a clear legal framework.

1.2.3 The Markets in Financial Instruments Directive

The MiFID⁵ has established a comprehensive regulatory framework governing the organised execution of investor transactions by exchanges, other trading systems and investment firms. The MiFID imposes a “best execution” obligation to ensure that investment firms execute client orders on the terms that are most favourable to the client. This obligation should apply to firms with contractual or agency obligations vis-à-vis their clients. A review launched in late 2010 will update the MiFID in the light of recent developments.

A major achievement of the MiFID relates to clearing and settlement systems, as member states are required to grant: (i) local regulated markets access to a CCP, clearing house or settlement system from another member state; (ii) investment firms from other countries access to a CCP and clearing and settlement systems in their territory; and (iii) local investment firms access to a CCP, clearing house or settlement system of another member state.

1.2.4 The Winding-up Directive

The Directive on the reorganisation and winding-up of credit institutions⁶ introduced the principle of home control for the winding-up and reorganisation proceedings of a credit institution with branches in other member states. Such credit institutions are subject to a single proceeding in the home member state in which the credit institution has its registered office, governed by that country’s law. Reorganisation and winding-up measures are fully effective in all the member states and against third parties in particular. The administrative or judicial authorities of the home member state are required without delay to inform the competent authorities of the member state in which the branch is established of their decision to open winding-up proceedings.

⁴ Directive 2002/47/EC of 6 June 2002 on financial collateral arrangements, OJ L 168, 27.6.2002, p 43, as amended.

⁵ Directive 2004/39/EC of 21 April 2004 on markets in financial instruments amending Council Directives 85/611/EEC and 93/6/EEC and Directive 2000/12/EC of the European Parliament and of the Council and repealing Council Directive 93/22/EEC, OJ L 145, 30.4.2004, p 1, as amended.

⁶ Directive 2001/24/EC of 4 April 2001 on the reorganisation and winding up of credit institutions, OJ L 125, 05.05.2001, p 15.

The Directive also contains provisions concerning conflicts of law relating to collateral arrangements, setoffs, repurchase agreements (repos) and netting agreements in an insolvency situation. It provides for the recognition of setoffs in the event of credit institutions becoming insolvent. As regards the enforcement of proprietary rights for collateral security recorded in a register, account or CSD, the Directive confirms that the national legislation to be applied is that of the member state where the relevant register, account or CSD is held or located. Furthermore, it stipulates that netting agreements and repos are governed solely by the national law indicated in the contract governing the relevant agreement.

1.2.5 The Payment Services Directive

The Payment Services Directive⁷ creates a harmonised legal framework for payments and establishes a common legal basis for SEPA, thereby ensuring that payments (particularly credit transfers, direct debits and card payments) can be made safely and securely within and between the various member states. It also establishes the concept of “payment institutions” – licensed payment service providers which can provide payment services across the EU under a lighter supervisory regime than banks. By opening up the market in this way, the European legislator allows new service providers to compete with existing participants on a level playing field, thereby facilitating greater competition.

The Directive introduces transparent conditions and a series of harmonised information requirements applying to all payment service providers, irrespective of whether they offer SEPA payment products or those already in existence at the national level. Moreover, the Directive aims to establish clarity and certainty with regard to the principal rights and obligations of users and providers of payment services. It seeks to bring about greater efficiency (for example, by ensuring that payments initiated by the payer are completed a maximum of one day after the payment order is given),⁸ increased levels of consumer protection and greater legal certainty (through rules on liability and provisions on the revocability of payments). These measures aim to extend the rights and protection enjoyed by users of payment services (consumers, retailers, large and small undertakings, public institutions, etc).

1.2.6 The Regulation on cross-border payments in the Community

The Regulation on cross-border payments in the Community entered into force in November 2009, repealing Regulation (EC) No 2560/2001 on cross-border payments in euros.⁹ The Regulation provides that charges applied to cross-border payments in euros up to an amount of €50,000 must be the same as those levied by the payment service provider in question for corresponding national payments of the same value and in the same currency.

The Regulation extends the principle of equal charges for national and cross-border payments to cover direct debits, as well as credit transfers, electronic payments (including card transactions) and cash withdrawals at ATMs which were already covered by the previous regulation. It strengthens the role of the competent national authorities in the areas of supervision and the resolution of complaints and provides for the establishment of out-of-court redress procedures. For transfers of up to €50,000, it also removes the payment-based

⁷ Directive 2007/64/EC of 13 November 2007 on payment services in the internal market, OJ L 319, 5.12.2007, pp 1–36.

⁸ Until 1 January 2012, a payer and its payment service provider can agree on a period of no more than three business days. These periods may be extended by a further business day for payment transactions initiated in paper form.

⁹ Regulation (EC) No 924/2009 of 16 September 2009 on cross-border payments in the Community and repealing Regulation (EC) No 2560/2001, OJ L 266, 9.10.2009, pp 11–18.

statistical reporting obligations for banks that used to hinder the smooth flow of cross-border transactions.

To facilitate the use of the SEPA direct debit scheme, the Regulation introduces a “reachability” requirement for direct debits and temporary rules on multilateral interchange fees for direct debit transactions. These temporary rules are intended to give the payment industry time to develop a long-term business model for direct debits which fully respects the rules on competition. In addition, a payment service provider must, where applicable, inform its customers of their IBAN and the institution’s BIC. If a payment user initiating a transaction fails to inform its payment service provider of the beneficiary’s BIC or IBAN, the bank is entitled to charge additional fees. Member states which have not adopted the euro have the option to apply the Regulation to their own currency, provided that the European Commission is informed accordingly.

1.2.7 Regulation on information on the payer accompanying transfer of funds

Regulation (EC) No 1781/2006 on information on the payer accompanying transfers of funds¹⁰ provides that payment service providers must, at every stage of the payment process, forward complete information concerning the payer. The information includes the name, address and account number of the payer and should be verified by the payer’s payment service provider prior to the transfer of funds. Where the payment service providers of both the payer and the payee are located within the EU, payments can simply be accompanied by the account number of the payer or a unique identifier, which allows the transaction to be traced back to the payer.

The aim of this measure is to prevent, investigate and detect money laundering and the financing of terrorism. The Regulation transposes Special Recommendation VII of the Financial Action Task Force into EU law, as well as forming part of the EU’s action plan on combating terrorism.

1.2.8 The E-Money Directive

The original E-Money Directive¹¹ sought to regulate market access for a new type of payment service provider. Under its provisions, issuers of electronic money – ie claims against an issuer which are stored on an electronic device capable of being used as a means of payment vis-à-vis third parties – were partially equated with credit institutions. In particular, issuers of electronic money were made subject to authorisation and supervisory requirements with the aim of creating a level playing field for the issuance of e-money and a “single passport” for the provision of such services. The Directive thereby sought to promote the provision of e-money.

The revised E-Money Directive¹² lays down a lighter supervisory regime for e-money institutions, reducing the initial capital requirement from €1 million to €350,000, and introduces new rules on the calculation of e-money institutions’ own funds. The aim is that, in combination with the abolition of the principle of exclusivity, the new rules will make it easier for electronic money institutions active in other sectors (such as the telecommunications

¹⁰ Regulation (EC) No 1781/2006 of 15 November 2006 on information on the payer accompanying transfers of funds, OJ L 345, 8.12.2006, p 1.

¹¹ Directive 2000/46/EC of 18 September 2000 on the taking up, pursuit of and prudential supervision of the business of electronic money institutions, OJ L 275, 27.10.2000, pp 39–43.

¹² Directive 2009/110/EC of 16 September 2009 on the taking up, pursuit and prudential supervision of the business of electronic money institutions amending Directives 2005/60/EC and 2006/48/EC and repealing Directive 2000/46/EC, OJ L 267, 10.10.2009, pp 7–17.

industry) to develop innovative services in the payment market. Thus the range of activities that e-money institutions are allowed to perform has been broadened and, at the same time, the supervisory framework has been relaxed. In addition, e-money institutions are no longer regarded as credit institutions.

1.2.9 Legislative initiatives

Following the G20 commitment to clear standardised over-the-counter (OTC) derivatives via CCPs and use trade repositories, in September 2010 the Commission proposed a draft regulation, known as the European Market Infrastructure Regulation (EMIR).¹³ This is designed to ensure that CCPs comply with high prudential standards, that trade repositories are subject to adequate regulation, and that issues of licensing, ongoing supervision and operational conditions are harmonised EU-wide to stem risks from CCPs' and trade repositories' activities.

In 2009 the Commission launched an initiative to harmonise the laws governing securities holdings and transfers in the EU, aiming at dismantling the legal barriers that impede efficient cross-border securities settlement. A draft legal act on legal certainty of securities holding and transactions, known as the Securities Law Directive, is under preparation to harmonise: (i) the legal framework for holding and transferring book-entry securities; (ii) the conflict of law rules; (iii) the rights and obligations of account providers; and (iv) the rights flowing from book-entry securities. The Commission is in the process of drafting a regulation on CSDs, covering core and ancillary services, licensing, ongoing supervision and the cross-border provision of services and laying down prudential requirements for CSDs, as well as operational conditions to address risks stemming from their activities. The future regulation is expected to introduce a sound legal framework for CSD services, improve legal certainty and foster a level playing field in the EU.

In December 2010 the Commission published a proposal for a regulation establishing technical requirements for credit transfers and direct debits in euros (the SEPA Migration End Date Regulation).¹⁴ The aim is to ensure a quick and smooth migration to pan-European credit transfers and direct debits by phasing out existing national payment instruments. In order to ensure interoperability, it is proposed that the use of certain common standards and technical requirements be mandatory for all credit transfers and direct debits in euros in the EU.

1.3 The role of the Eurosystem

The ECB and the Eurosystem central banks have traditionally been involved in payment, clearing and settlement systems in many different ways: as operators of systems; as providers of central bank money as a settlement asset; as participants in systems; as promoters of an efficient overall payment infrastructure; and as overseers. The smooth functioning of payments, clearing and settlement is of particular concern to the Eurosystem for three main reasons: (i) a major malfunction in the market infrastructure could undermine the stability of financial institutions and markets; (ii) the soundness and efficiency of systems and the security of payment instruments affect the confidence of users and, ultimately, public confidence in the currency; and (iii) payment systems and – as all Eurosystem credit operations need to be fully collateralised – securities clearing and settlement systems represent essential vehicles for implementing monetary policy.

¹³ COM(2010) 484/5.

¹⁴ COM(2010) 775 final.

Safety concerns and the desire to mitigate such risks inevitably lead to costs being incurred by system operators and participants. As a result, a prudent design of payment and settlement systems involves weighing the benefits of risk mitigation against the cost efficiency of operating and participating in such systems.

The Eurosystem considers that achieving the appropriate combination of safety and efficiency in payment and settlement systems may require some form of public involvement to ensure that participants and operators have the right incentives to act prudently, avoid risk and minimise the overall cost to society. To this end, the Eurosystem, like most central banks worldwide, is active in its currency area in an oversight role, as a system operator and in a supporting capacity as a catalyst for the development of private sector solutions.

1.3.1 The Eurosystem's operational role

One way for central banks to promote the safe and efficient functioning of payments and settlements is to operate their own facilities. The main operational role of the Eurosystem lies in the provision of the TARGET2 system, the real-time gross settlement (RTGS) system for the euro. It provides facilities for settlement of euro payments in central bank money, with immediate finality. TARGET2 is an important tool for the Eurosystem, facilitating the implementation of its monetary policy and supporting the functioning of the euro area's money and capital markets. TARGET2 forms the backbone of the arrangements in place for settling interbank obligations arising from financial and economic activities in euros. It settles individual large-value and urgent payments, as well as positions in a wide variety of ancillary systems. TARGET2 is also used by banks in managing their core liquidity (see Section 3.2.1.3).

Another important Eurosystem service contributing to the integration of the money market is the CCBM, which allows the cross-border transfer of collateral within the euro area in Eurosystem credit operations. In the absence of adequate market arrangements for the cross-border mobilisation of collateral, the Eurosystem introduced the CCBM in 1999 as an interim solution, expecting that market solutions would develop over time. However, this service has become the main channel for the use of collateral on a cross-border basis in Eurosystem credit operations (see Section 4.4.4).

Some Eurosystem central banks also provide facilities for handling retail payments or operate in-house SSSs. More detailed descriptions of the respective systems can be found in the relevant descriptive Red Book country chapters.

The integration of securities markets relies on the integration of the underlying infrastructure. Progress in the integration of euro securities infrastructures has not kept pace with that of large-value payment infrastructures. Although a number of important complementary public and private sector initiatives have been proposed, one element missing from such initiatives is the establishment of a common, neutral settlement platform fostering effective interoperability and competition between service providers. Seeking to promote financial integration through the provision of central bank services and drawing on its experience in setting up market infrastructures, in 2006 the Eurosystem launched its T2S project in order to close this gap (see Section 4.4.5).

1.3.2 The Eurosystem's oversight role

Within the euro area, oversight is the responsibility of the Eurosystem. It is conducted on the basis of common policies and practices established by the Governing Council of the ECB. The Eurosystem oversight competence is based on the mandate specified by Article 127(2) TFEU and Articles 3 and 22 of the Statute of the ESCB and the ECB. Ensuring that payment, clearing and securities settlement systems function safely and efficiently is an important precondition for the Eurosystem's ability to contribute to the stability of the financial system in the euro area. The recent global financial crisis has shown that effective market

infrastructures are essential for the proper functioning of financial markets and that oversight helps to ensure that systems are set up such as to minimise the risk potential. In addition, the stability of financial market infrastructures is important for the smooth conduct of the ECB's monetary policy and for maintaining public confidence in the currency.

The Eurosystem defines the oversight of payment, clearing and settlement systems as a central bank function whereby the objectives of safety and efficiency are promoted by monitoring existing and planned systems, assessing them against these objectives and, where necessary, fostering change. The Eurosystem includes payment instruments in this definition, as they are an integral part of the payment system. It does not actively pursue other public policy objectives, such as combating money laundering, data protection, consumer protection or the avoidance of anti-competitive practices in payment and settlement systems, where other authorities have an explicit mandate.

Four important principles are applied in Eurosystem oversight. First, the Eurosystem has high standards regarding transparency. It publishes its oversight policies and provides regular and comprehensive information about its oversight activities. In this way, the Eurosystem can demonstrate the consistency of its approach to oversight and provide a solid basis on which to judge the effectiveness of its policies, thereby ensuring that its oversight activities are performed in an accountable manner. A report providing information on Eurosystem oversight activities is published on a regular basis. Second, within the ECB, oversight is conducted by a dedicated team which is separate from the ECB's operational units. The same principle of the separation of functions is applied by the Eurosystem NCBs. This helps to address the potential for conflicts of interest as a result of the central bank being both the system operator and the oversight authority. Third, in order to ensure equal treatment, the ECB and the Eurosystem NCBs apply the same oversight policies to all systems, ie both private systems and those operated by the central banks themselves. Fourth, systems' owners and operators have primary responsibility for ensuring the reliable functioning of their infrastructures and for providing safe and efficient payment and settlement services.

The objectives, scope, methodology and organisation of the Eurosystem's oversight function, as well as details of the Eurosystem's cooperation with other authorities and central banks, are clearly set out in the document entitled "Eurosystem oversight policy framework", which was published by the ECB in February 2009 and updated in May 2011.¹⁵ The Eurosystem's oversight activities are guided by the objective of promoting the smooth functioning (ie the safety and efficiency) of payment, clearing and securities settlement systems. The current scope of the Eurosystem's oversight activities spans from payment systems and payment instruments, SSSs, CCPs and certain third-party service providers to correspondent banking and trade repositories. The scope and depth of the Eurosystem's oversight activities may change over time, as the systems themselves evolve.

The Eurosystem performs its oversight tasks on the basis of standards and recommendations developed either by itself or in cooperation with other central banks or authorities. These standards and requirements are largely based on international standards developed by the Committee on Payment and Settlement Systems (CPSS), or the CPSS jointly with the International Organization of Securities Commissions (IOSCO). For example, the ESCB and the CESR have published recommendations for SSSs and CCPs in the EU. The Eurosystem applies its policy requirements and standards across all systems (ie both systems run by central banks and private sector operated systems) ensuring that its oversight activities are transparent as well as effectively coordinated and consistently implemented across the euro area, thus ensuring a level playing field.

¹⁵ Available on the ECB's website at <http://www.ecb.europa.eu>.

The Eurosystem entrusts the role of lead overseer over a specific system to the Eurosystem central bank that is best placed to conduct that oversight, either because of its proximity to the overseen entity (for example, where the system is legally incorporated in its jurisdiction), or where national laws attribute specific oversight responsibilities to the central bank concerned. This is typically the case for systems that are clearly anchored in one particular country. For others, the body entrusted with oversight responsibility is the NCB where the system is legally incorporated, unless the Governing Council of the ECB decides otherwise and assigns primary responsibility for oversight to the ECB (as is the case for TARGET2 and EURO1). For card payment schemes operating in more than one euro area country (ie cross-border schemes), the lead overseer within the Eurosystem coordinates the implementation of an oversight assessment carried out by an assessment group (“college”).

Cooperation with other authorities is an important means of ensuring effective and efficient oversight, as the oversight responsibilities of central banks are closely related to the responsibilities of other prudential supervisors and securities regulators. In the case of securities clearing and settlement systems, the Eurosystem benefits from the oversight powers conferred on the NCBs by national legislation. Each NCB reports on its own oversight assessments, which are conducted in cooperation with the relevant securities regulators, with a view to ensuring the transparent implementation of the recommendations in the various countries. Transparency and consistency are ensured through the application of the ESCB-CESR recommendations for SSSs and CCPs in the EU. In addition to any arrangements that NCBs may have in place governing cooperation with other national authorities, the Eurosystem has concluded Memorandums of Understandings (MoUs) with prudential supervisors and regulators in order to lay down procedures and principles for regulatory cooperation.

Cooperative oversight arrangements at international level (eg those in place for CLS and SWIFT) as well as the Eurosystem’s location policy are instruments to address risk and the growing importance of interdependencies, not the least in a cross-border or cross-currency context. For the Eurosystem, infrastructures processing euro-denominated transactions that may have systemic relevance for the euro area should settle in central bank money and be located in the euro area. The Eurosystem accepts exceptions to this rule only in very specific circumstances and on a case by case basis. However, the Eurosystem recognises that offshore systems and interdependencies with systems and third-party providers create the need for efficient and effective cooperation between the central banks responsible for the oversight of such systems.

1.3.3 The Eurosystem’s catalyst role

The Eurosystem, playing a catalyst role, seeks to facilitate and thus improve the efficiency of the overall market arrangements for payments, clearing and settlement. Financial integration and financial development are two complementary processes facilitating efficiency. The catalyst function complements the oversight function, which aims to ensure the safety and efficiency of individual payment, clearing and settlement systems, as well as the safety of the overall market infrastructure.

While in the euro area the market segment for large-value payments is already well integrated, the Eurosystem has a keen interest in the integration of the market segments for retail payments and securities. The Eurosystem encourages change in these market segments and strives to overcome the problem of fragmentation, which leads to inefficiencies, lower levels of growth and innovation, and unnecessary risks associated with the complexity of the market.

The establishment of efficient and integrated euro area-wide markets for the handling of retail payments and securities where previously there were only fragmented national markets is a complex process involving a large number of infrastructure operators, many thousands of financial institutions and hundreds of millions of different end users. It is therefore not

surprising that coordination challenges occasionally arise, especially given that stakeholder groups and institutions sometimes have divergent interests. Acting as a facilitator, the Eurosystem aims to help the private sector to overcome these problems. Drawing on its position as a public authority and a neutral party, as well as its relationships with market participants and its considerable experience in the areas of payment and settlement, it seeks to assist the market in organising cooperation, defining development strategies, setting milestones and timetables and ensuring the effective sharing of information.

As a monetary authority with responsibilities in the area of payments and settlement, the Eurosystem guides the work of the private sector by defining and clearly communicating the public policy objectives to be achieved. Such guidance is essential in complex projects lasting a number of years and involving a considerable number of stakeholders – eg the SEPA project.

When setting policy objectives, the Eurosystem generally organises discussions regarding strategy or obtains the necessary information by other means, involving all relevant stakeholders. It has, for instance, consulted the banking industry, infrastructure providers and end users (including corporations, merchants, small and medium-sized enterprises, public administrations and consumers) on SEPA-related issues. Similarly, users of securities infrastructures are consulted and involved in discussions on post-trading issues. Thanks to regular and close contact with market participants and their associations, the ECB is able to convey its ideas to the private sector and obtain feedback from the market. Two examples of this cooperation are the Contact Group on Euro Payments Strategy (COGEPS) and the Contact Group on Euro Securities Infrastructures (COGESI).

The establishment of an integrated euro area market requires the existence of common standards for a variety of activities. The Eurosystem attaches great importance to the development and implementation of standards providing the basis for effective communication, interoperability and process automation.

To facilitate the integration of the retail payments market the Eurosystem has supported the development of various technical standards for retail payments. In the context of the SEPA project, it has continuously followed and encouraged the standardisation work carried out by the banking industry. In 2004 the Eurosystem established a set of seven high-level recommendations regarding standardisation work.¹⁶ It asked that the industry formulate and regularly review a strategic vision – complemented by a detailed action plan – setting out the business and technical standards necessary in order to design and implement safe, efficient and fully automated payment services using the best available technology with a view to supporting the SEPA project. Initiatives aimed at strengthening the security of payment services and combating fraud also need to be developed in more detail, as well as work on definition and implementation in forward-looking areas such as e-payments, e-invoicing and m-payments.

The Eurosystem considers that the creation of a single retail payments market is important for the integration of banking markets and European integration in general. The Eurosystem has given the industry considerable guidance in order to ensure that this market is established in the way that best meets the needs of Europe's citizens and corporations.

The objectives of the Eurosystem's catalyst function in the field of securities are broadly similar to those pursued in the field of payments: more transparent, efficient and resilient infrastructures, leading to wider choice and lower costs for users and, ultimately, sustainable growth in the securities markets of the various euro area countries. Efficiency requires the

¹⁶ *Towards a single euro payments area – third progress report*, Annex 5: Seven high-level recommendations for standards, ECB, December 2004, available on the ECB's website at <http://www.ecb.europa.eu>.

harmonisation of processes and business practices across borders, as well as the removal of barriers to competition and consolidation within the European securities infrastructure. This infrastructure needs to be reshaped to allow all euro area securities to be easily transferred from one part of Europe to another. Over the years, the Eurosystem has held regular meetings with market participants to discuss issues relevant to the harmonisation and integration of the securities market infrastructure.

In the field of securities infrastructure, some consolidation has been achieved in the euro area through mergers and acquisitions involving CSDs. However, this process has been slow and limited in scope, notably owing to significant market-related and regulatory obstacles. Because market-led consolidation seemed unlikely to deliver an integrated market infrastructure for Europe in the foreseeable future, in mid-2006 the Eurosystem, acting in its operational role, decided to launch the T2S project, with a view to establishing a single platform for the settlement in central bank money of securities transactions in Europe. However, in parallel with its work to develop T2S, the Eurosystem continues to act as a catalyst for integration as regards other aspects of post-trading services. Without harmonisation of national market practices, the competition and efficiency benefits of system integration and interoperability cannot be maximised. The ECB is a member of the Expert Group on Market Infrastructures, which since autumn 2010 advises the European Commission on specific issues related to post-trading in the EU and on forthcoming European legislation in this area. The Eurosystem has also been playing a catalyst role through the work of the T2S Advisory Group in the field of securities handling.

The ECB has played an important catalyst role in some major policy initiatives launched by the European Commission. One of these initiatives is the removal of the 15 “Giovannini barriers”¹⁷ to the cross-border integration of clearing and settlement systems in Europe. A second initiative is the Code of Conduct for Clearing and Settlement signed by the European industry associations for exchanges and post-trading infrastructures in 2006. The Code covers issues such as price transparency, access and interoperability, as well as service unbundling and accounts separation.

A further aspect of the catalyst activities relates to the continuous development and sharing of expertise in the field of payments, clearing and settlement. The Eurosystem regularly collects and publishes relevant data, reports on payment, clearing and settlement-related issues, holds frequent bilateral and multilateral meetings with a wide variety of stakeholders, carries out surveys and fact-finding exercises, issues newsletters and produces a large number of publications in this field.

1.3.4 Cooperation with other institutions

In addition to defining policies and principles on its own, the Eurosystem interacts extensively with other bodies and institutions active in the area of payment and settlement systems.

There are regular contacts and exchanges of information at policy and expert level between the Eurosystem and the European legislator, both at EU level and at the level of individual euro area countries. The Council of the EU and the European Parliament are empowered to adopt legal instruments, while the powers of the European Commission include acting as the guardian of the EU’s treaties and proposing legislation to the Parliament and the Council. The ECB is consulted on any proposed EU or draft national act in its fields of competence. Moreover, the ECB may submit opinions to the appropriate EU institutions on matters in its fields of competence.

¹⁷ See “Cross-border clearing and settlement arrangements in the European Union”, Giovannini Group, Brussels, November 2001.

In addition to contact on legal and regulatory issues, financial integration is one prominent subject area in which the Eurosystem and the European Commission support each other's work and, where necessary, coordinate their policies. There is regular contact between the ECB and the European Commission's Directorate General Internal Market and Services in order to exchange views on payment- and settlement-related issues. Where necessary, the ECB also interacts with the Directorate General for Competition with a view to providing information on issues surrounding the functioning of market infrastructures. Information is also regularly provided to the European Parliament, particularly its Committee on Economic and Monetary Affairs.

Central banks and banking supervisors have shared responsibility for maintaining financial stability. Central bank overseers will want to be informed in the event that banking supervisors identify a serious problem in an institution participating in a system, while banking supervisors will want to be informed if central bank overseers identify a payment, clearing or settlement-related risk that will potentially affect participants in a system or arrangement. For these reasons, in 2001 the ECB, ESCB central banks and EU banking supervisors concluded an MoU on cooperation and information-sharing.

Activities relating to financial instruments are of common interest to central banks and securities regulators. Cooperation between the NCB and the national securities regulator takes different forms in the various euro area countries, with some countries specifying that cooperation and the division of responsibilities more formally in an MoU. At the EU level, with a view to promoting the development and consistent application of a common framework for regulation, supervision and oversight, the ESCB and the CESR jointly developed recommendations for SSSs and CCPs in the EU in 2009.

A wide variety of arrangements are in place for Eurosystem cooperation and interaction with other market infrastructure stakeholders at the European level. The COGEPS addresses issues and developments in the field of payment systems and services that are relevant for the euro area banking industry and for the Eurosystem. It covers both large-value and retail payment systems and services and comprises representatives of the Eurosystem and of the euro area banking industry (on behalf of commercial banks, EU banking associations and the working groups of the European Payments Council (EPC)). The European Commission attends with observer status, as do four delegates from the non-euro area EU central banks. The COGESI deals with issues that are relevant for the euro securities settlement industry and of common interest to the Eurosystem, market infrastructures and market participants. These include developments in the fields of collateral management and liquidity management, infrastructure developments, issues related to regulation, standards and legal frameworks, and post-trading activities in general. The group comprises representatives of the Eurosystem, market infrastructures (CSDs, international CSDs (ICSDs), CCPs and exchanges) and infrastructure users (mostly banks, including custodians).

The Euro CLS group addresses issues related to the functioning of the CLS system – particularly liquidity management issues arising in the settlement process, with a special focus on euro liquidity issues. As regards retail payments and SEPA-related issues, contact group meetings are complemented by strategic discussions in the SEPA High-level Group, which comprises board members of euro area NCBs, board members from 25 commercial banks, and the Chair and Vice-Chair of the EPC.

In the field of large-value payments, TARGET2-related issues are discussed at the regular meetings of the Eurosystem Working Group on TARGET2 and the private sector TARGET Working Group. At the national level, TARGET user group meetings provide a forum for discussions between the relevant NCB and its banking community.

Close cooperation with all relevant stakeholders is a key objective of the Eurosystem in relation to the T2S project. Work on this project is being carried out with high transparency, and key stakeholders are closely involved in the project's governance arrangements.

Furthermore, public consultations constitute an important tool enabling the Eurosystem to communicate proposed future policies and plans to stakeholders and the general public, giving participants the opportunity to scrutinise and comment on such plans prior to implementation.

At the global level, the most important forum for multilateral central bank cooperation on market infrastructure issues is the CPSS. The CPSS has become known as the main international standard setter in the area of payment, clearing and settlement systems. The ECB and the other CPSS member central banks in the euro area have contributed actively to the joint CPSS-IOSCO review of the three sets of CPSS core principles and CPSS-IOSCO recommendations. Moreover, they also contribute – whether directly or via the CPSS – to work conducted under the auspices of the Financial Stability Board and the work of the OTC Derivatives Regulators' Forum.

Finally, as the central banking system of a major world currency, the Eurosystem is, of course, also involved in a wide range of regular and ad hoc bilateral and multilateral central bank cooperation and technical assistance activities.

1.3.5 The role of other private and public sector bodies

1.3.5.1 Banking associations and federations

Most banks in the EU are organised into national federations or associations that represent their members' interests vis-à-vis other public and private institutions. The national federations and associations also cooperate at the European level in the European Association of Co-operative Banks (EACB), the European Savings Banks Group (ESBG) and the European Banking Federation (EBF) – the so-called European Credit Sector Associations. These three organisations act as platforms for exchanging views, for reaching agreement on common business policies and for discussing other matters which require a common understanding at the European level, including payment issues.

1.3.5.2 Other associations, federations and councils

Market players have organised themselves to consider issues in the field of payment and securities clearing and settlement systems. These bodies act as platforms to promote the interests of their members, to facilitate the exchange of views and to develop common standards and practices.

The most prominent forums in the payments market are the European Payments Council (EPC) (see Section 2.2.2) and the Euro Banking Association (EBA).

The most important organisations with regard to financial instruments are the European Central Securities Depositories Association (ECSDA), the European Association of Central Counterparty Clearing Houses (EACH) and the Federation of European Securities Exchanges (FESE).

Furthermore, in order to address the need for proper governance of the SEPA project and to increase the involvement of end users, the ECB and the European Commission agreed on the creation of the SEPA Council in March 2010. This new overarching body is co-chaired by the ECB and the European Commission and brings together high-level representatives of the supply and demand sides of the payments market. The SEPA Council is scheduled to take place twice a year.¹⁸

¹⁸ For further details, please see the SEPA Council website at <http://www.sepacouncil.eu>.

2. Payment media used by non-banks

2.1 Cash payments

The euro was launched as a currency in its own right on 1 January 1999. Euro banknotes and coins were introduced three years later on 1 January 2002. Since then, citizens of the euro area have been able to make cash payments in all euro area countries using one single currency.

Cash is still the most important instrument for retail transactions in the euro area, although transaction volumes vary considerably from country to country. It should be noted that while the relative importance of cash payments is decreasing, the absolute value of the outstanding stock of cash is expected to continue growing.

2.2 Non-cash payments

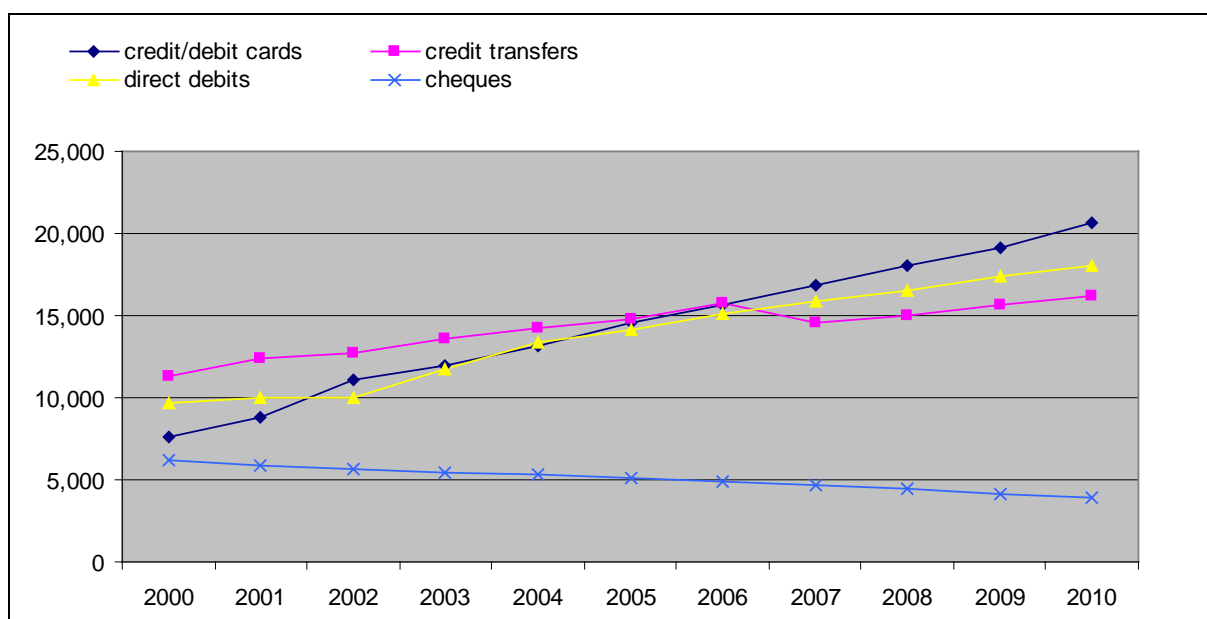
2.2.1 Non-cash payment instruments

Payment cards, direct debits, credit transfers and cheques are the main non-cash payment instruments in the euro area. Over the last 10 years payment cards have displayed the strongest growth, with transaction volumes more than doubling. Consequently, payment cards have overtaken credit transfers as the most widely used non-cash payment instrument in the euro area. Direct debits have also seen steady growth, while the use of cheques has been declining. Indeed, in some euro area countries, cheques have been abolished altogether. E-money payments have remained of marginal importance: they are used only to a very limited extent and several e-money schemes have ceased operating. Trends in the use of the various payment instruments in the euro area from 2000 to 2010 are shown in Chart 1.

Chart 1

Main non-cash payment instruments in the euro area

In millions of transactions



Source: ECB.

National preferences vary widely as regards the use of the various instruments for cashless retail payments, as shown in Table 1. Moreover, there are marked differences in the per capita number of non-cash payment transactions, as shown in Chart 2.

Table 1
**Relative importance of the main payment instruments
in the euro area¹**

2010; percentages of total number of transactions

	Credit transfers	Direct debits	Cards	Cheques
Belgium	42.13	10.31	44.71	0.30
Germany	33.86	50.16	15.47	0.28
Estonia ²	34.23	6.67	59.10	0.00
Ireland	22.62	15.70	48.46	13.22
Greece	34.24	9.20	42.67	12.21
Spain	14.42	42.21	40.82	1.85
France	17.53	20.00	43.33	18.31
Italy	30.65	14.81	37.52	7.88
Cyprus	27.78	8.61	39.01	24.60
Luxembourg ³	45.22	10.64	44.01	0.13
Malta	19.96	3.97	42.48	33.59
Netherlands	29.57	24.39	42.71	–
Austria	42.31	37.19	18.60	0.09
Portugal	10.85	13.59	67.99	7.42
Slovenia	50.10	14.94	34.90	0.06
Slovakia	55.89	15.41	28.68	0.01
Finland	41.98	4.33	53.64	0.02

– = not applicable.

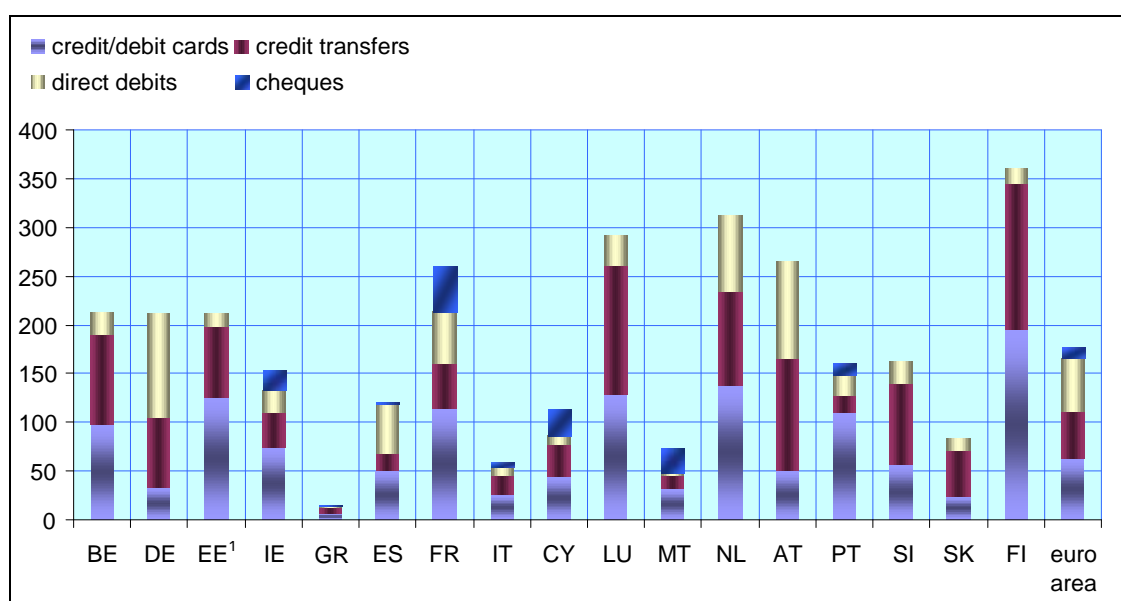
¹ Percentages may not add up to 100% as e-money transactions and other payment instruments are not shown. ² Estonia joined the euro area in 2011. ³ E-money transactions are excluded from the breakdown for methodological reasons.

Source: ECB.

Chart 2

Use of main non-cash payments in the euro area

Number of transactions per capita, 2010



¹ Estonia joined the euro area in 2011.

Source: ECB.

2.2.2 The migration to SEPA instruments

With the support of the European public authorities, the European banking industry has launched the Single Euro Payments Area project, a series of initiatives aimed at introducing common instruments, standards and infrastructures for retail payments in euros. The objective is to overcome fragmentation in the retail payments market by transforming the various national markets into one SEPA market. All euro payments in the euro area should thereby become domestic payments. This should allow users to make payments in euros throughout Europe from a single bank account, using a single set of payment instruments, as easily and securely as in the national context today. Citizens, companies and financial institutions will benefit from the streamlined handling of payments throughout Europe.

In June 2002 the banking industry established the EPC, comprising 65 bank delegates representing different types of European bank, the three European Credit Sector Associations and the EBA. The EPC includes stakeholders from the 27 EU member states and from Iceland, Liechtenstein, Monaco, Norway and Switzerland. It is governed by the EPC Plenary, its decision-making and coordinating body. The EPC focuses on payments in euros, and so SEPA is primarily a euro area project. However, the non-euro area countries represented in the EPC have chosen to adopt the SEPA standards and practices for their payments in euros.

The building blocks for a fully integrated European market for retail payment services are the euro, the Payment Services Directive (which provides a common legal basis) and the elements of SEPA discussed below. The EPC has developed a set of rulebooks and frameworks to govern the SEPA instruments.

2.2.2.1 SEPA Credit Transfer (SCT) rulebook

The EPC has established common rules and obligations to be observed by participants in the SCT scheme. The rulebook details the functioning of the scheme and governs the scheme's relationship with processing infrastructures. It stipulates a maximum execution time, guarantees that the full amount will be credited to the recipient's account and places no limit on the value of payments.

The SCT scheme is built on well known international standards: IBAN, BIC and UNIFI (ISO 20022) XML message standards. Under the scheme, the latest possible settlement time for credit transfers is D+3 – ie the payee's account should be credited three business days at the latest after the payment is initiated by the payer. The Payment Services Directive provides that this should be reduced to one business day (ie accounts should be credited D+1) by 2012. The SCT scheme was rolled out on 28 January 2008.

2.2.2.2 SEPA Direct Debit (SDD) rulebook

The SDD rulebook lays down a set of interbank rules, practices and standards enabling the banking industry to provide direct debit services on the basis of uniform conditions throughout SEPA. The SDD scheme is based on the "creditor mandate flow" (where the mandate is given to the creditor, as opposed to the payer's bank). In addition, the business-to-business SDD has been set up, aiming to cover the specific needs of businesses. The rollout of SDD took place on 1 November 2009.

The success of the SDD scheme can only be assured if all banks participate, thereby making all debtors "reachable" for direct debit transactions. Reachability for core direct debit transactions became mandatory on 1 November 2010 for those banks in the euro area that currently offer direct debits in euros at the national level.¹⁹

2.2.2.3 SEPA Cards Framework (SCF)

In contrast to credit transfers and direct debits, the EPC has not established a "scheme" for card payments, but a framework – ie a set of high-level principles and rules. The SCF will be implemented by individual card schemes, banks and other stakeholders. The objective is to establish an integrated SEPA market where holders of general purpose cards can make payments and cash withdrawals in euros abroad with the same ease and convenience as in their home countries.

2.2.2.4 Framework for the evolution of the clearing and settlement of payments in SEPA

This framework establishes principles on how providers of clearing and settlement mechanisms (CSMs) can support the SCT and SDD schemes. It clearly delineates the roles and responsibilities of the scheme layer and the infrastructure layer. It also classifies the various infrastructure types, which range from pan-European automated clearing houses (ACHs) and intrabank or intergroup arrangements to purely bilateral arrangements such as correspondent banking.

The European Automated Clearing House Association (EACHA) has developed a "Technical Interoperability Framework for SEPA-compliant Giro Payments Processing", which may be used as the basis for interoperability agreements between banks and ACHs (see Section 3.1.2). The aim of both frameworks is to ensure that infrastructures will be able to process SEPA payments and all debtors will be reachable.

¹⁹ Regulation (EC) No 924/2009 of 16 September 2009 on cross-border payments in the Community and repealing Regulation (EC) No 2560/2001, OJ L 266, 9.10.2009, pp 11–18.

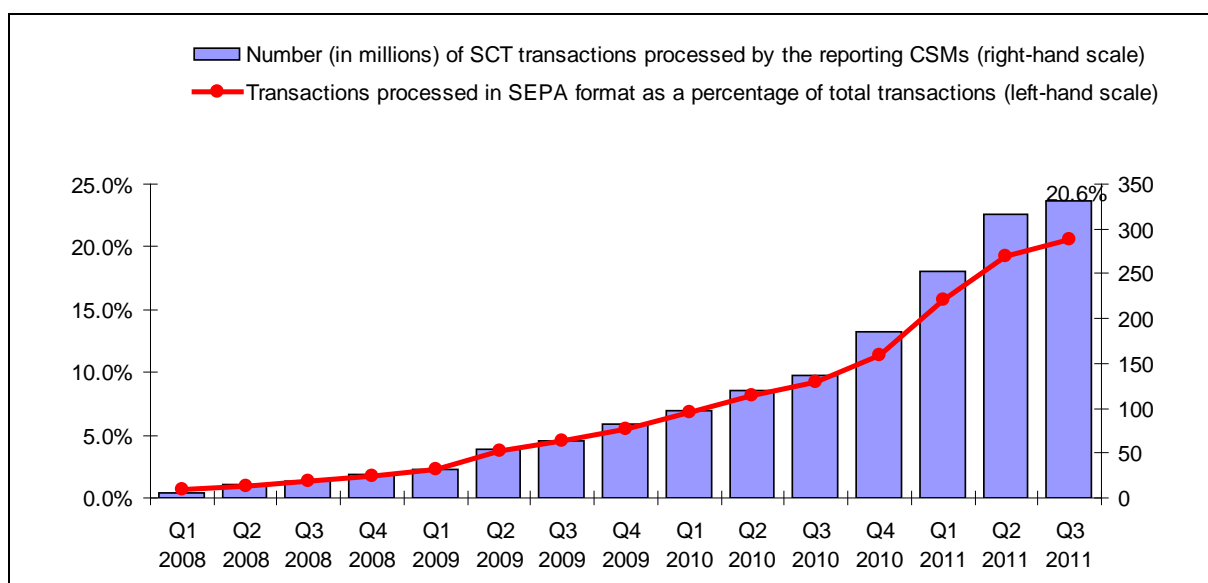
2.2.2.5 Single euro cash area

The smooth handling of payments requires a whole range of different instruments, including cash. In order to create a single euro cash area for professional cash handlers, the ECB has agreed on a number of measures aimed at creating a fair competitive environment as regards the cash services provided by the euro area NCBs to the banking industry, which is the Eurosystem's main counterpart for cash services and an intermediary in the provision of cash to the general public. Further steps will be implemented in order to achieve greater convergence as regards the cash services provided by NCBs in the medium term.

2.2.2.6 Use of SEPA Credit Transfer and SEPA Direct Debit

To monitor the usage of the new SEPA payment instruments during the migration period, the Eurosystem compiles a number of SEPA indicators. The euro area SCT indicator showed that by September 2011 some 21.1% of all credit transfers had migrated to SEPA. The volume of SCT transactions processed by CSMs in September 2011 amounted to 114.5 million transactions. Chart 3 shows the use of SCT since it was rolled out.

Chart 3
Migration to SEPA credit transfers



By the end of third quarter of 2011, the migration to SDD remained at a very low level. In September 2011 the euro area SDD indicator reached 0.13%. The volume of SDD transactions processed by CSMs located in the euro area amounted in September 2011 to 0.77 million transactions.

Both the SCT and SDD indicators are based on (aggregated) CSM data and relate to total credit transfers or direct debits processed by CSMs located in the euro area.

These data show that despite reaching a number of milestones, SEPA migration, as a self-regulatory process, did not achieve the desired results. The banking industry's self-imposed deadline of December 2010 for SEPA instruments to be in general usage – which was shared by the Eurosystem and the European Commission – was not met. Obviously, moral suasion only had a limited impact. To ensure the materialisation of SEPA benefits and following intense debate between the Eurosystem, the European Commission and the market, the European Commission in December 2010 launched a proposal establishing technical requirements for credit transfers and direct debits in euros, imposing, by means of an EU Regulation, an end date for migration to SCT and SDD. Subsequently, an agreement

was reached between the European Parliament and the Council, implying – among other things – that the end date for the migration to SEPA credit transfers and direct debits was set to 1 February 2014.

2.2.3 Future developments

In the coming years, two policy issues will gain in importance: security aspects of retail payments and innovation.

2.2.3.1 Security aspects

The security of retail payments is a key issue if consumers and businesses are to trust and have confidence in SEPA. The ECB's Payment and Settlement Systems Committee (PSSC) took the initiative to create a European forum on the security of retail payments (the SecuRe Pay Forum), which held its first regular meeting in early 2011. The SecuRe Pay Forum is based on voluntary cooperation between authorities and aims to foster common knowledge and understanding – in particular between overseers and supervisors of payment service providers – of the issues at stake in the field of retail payment security. SecuRe Pay will address issues concerning electronic retail payment services and retail payment instruments (excluding cheques and cash) provided within the EU/EEA member states. Its work will cover the whole processing chain independent of the payment channel. The Forum aims to focus on areas where major weaknesses and vulnerabilities are detected and, where necessary, will make recommendations.

In relation to security, in particular that of card payments, the SCF requires that all cards, POS terminals and ATMs in SEPA should be EMV²⁰ compliant by end-2010. However, the vast majority of SEPA cards are still equipped with a magnetic stripe, which makes them vulnerable to “skimming”, ie unauthorised reading of the data contained on the stripe either via a manipulated ATM or POS terminal or via a handheld reading device. With the payment data from the magnetic stripe, a “cloned” card can be made and subsequently used in non-EMV payment environments and “card-not-present” transactions. Against this background, the Eurosystem considers that all new SEPA cards should, by default, be issued as chip-only cards from 2012 onwards. If the industry decides to retain the magnetic stripe for practical reasons (eg travelling in non-EMV countries) any data enabling magnetic stripe transactions should be removed. Cards with legacy magnetic stripes should only be issued on the cardholder's request as long as non-EMV regions exist.

Finally, in the area of security, cross-sector cooperation as well as the active contribution of all stakeholder groups is essential. The Eurosystem considers that, in particular for remote payments, payment service providers should increase their efforts to implement state-of-the-art security standards and take appropriate actions to protect sensitive customer information. In addition, merchants should recognise that it is in their own interest to offer secure means of payment and therefore adopt the necessary measures. Finally, consumers also have a role to play, eg by keeping their online banking details secret and by using them only within the trusted online environments provided by their payment service providers.

2.2.3.2 Innovation

Europe is still a patchwork of national online markets and Europeans cannot yet enjoy the benefits of a single digital market. Traditional payment instruments, which have generally not been designed to cope with the needs of the online world and (except for credit card payments) are hardly useable on a cross-border level, still dominate payments for

²⁰ EMV is a standard for integrated circuit cards established by Europay, MasterCard and Visa.

e-commerce. Given the strong growth in e-commerce, the corresponding growth of online payments and the rising concerns over the substantial increase in fraud figures for card payments on the internet, there is a genuine need for secure and efficient online payment solutions throughout SEPA. Furthermore, the European Commission's Digital Agenda for Europe²¹ requires the definition of a date for moving to a single market for online payments.

The Eurosystem strongly encourages the banking industry to deliver SEPA-wide online e-payment solutions. However, little progress has been made so far. A positive and promising recent development is the "proof of concept" exercise of interoperability in the SEPA market (based on the EPC's work on e-payments) started by three prominent online banking-based e-payment systems (EPS, iDEAL and GiroPay) which other communities/schemes may join.

The m-payments dossier is still in its early stages. The large number of stakeholders to be involved makes the development of widespread m-payment solutions more complex. The Eurosystem expects the EPC's theoretical work to be finalised by mid-2012 at the latest and SEPA-wide customer offerings to emerge thereafter.

2.2.4 Multilateral interchange fees

In recent years interchange fees have become a controversial issue, subject to regulatory and antitrust investigations. Determining whether the level of multilateral interchange fees (MIFs) restricts competition is an issue for the competition authorities, and the European Commission is closely cooperating with its national counterparts. Certain card schemes have had to cut cross-border MIFs in order to comply with EU antitrust rules. The Commission has proposed to prohibit interchange fees for direct debits in its draft regulation on SEPA migration end dates, with the exception of direct debits resulting in R-transactions,²² subject to certain conditions. As for cards, the Commission published its decision on MasterCard's interchange fees in December 2007,²³ which was appealed by MasterCard in 2008. The Commission also acknowledged commitments made by MasterCard in 2009²⁴ and Visa in 2010²⁵ on reducing their MIFs. Despite the guidance provided by the Commission, the market still claims that further guidance is needed related to interchange fees for cards.

3. Payment systems

3.1 General overview

3.1.1 Large-value payments

With the introduction of the euro on 1 January 1999, the principles governing the provision of payment services within the euro area changed. The existence of a single currency meant that cross-border payments within the euro area were, in principle, no different from

²¹ Communication from the European Commission, *A Digital Agenda for Europe*, COM (2010) 245, 19 May 2010.

²² R-transactions are direct debit transactions that result in exception processing (eg on account of rejection, refusal, return or reversal).

²³ Commission Decision of 19 December 2007 in Cases COMP/34.579 – MasterCard, COMP/36.518 – EuroCommerce and COMP/38.580 – Commercial Cards (2009/C 264/04).

²⁴ Europa press release, IP/09/515.

²⁵ Commission Decision of 8 December 2010 in Case COMP/39.398 – Visa MIF (2011/C 79/05).

payments within an individual country. The conduct of a single monetary policy required the establishment of a single money market covering all euro area countries. As a consequence, the reshaping of the payment market landscape has been particularly pronounced in the area of large-value payment systems (LVPSs).

In the euro area the market segment for large-value payments is now served by two area-wide systems. The technically centralised TARGET2 system, owned and operated by the Eurosystem, provides for RTGS of euro payments in central bank money. TARGET2 is an essential vehicle for implementing the Eurosystem's monetary policy and for the functioning of the euro money market (see Section 3.2.1). The EBA's EURO1 system is a privately owned and operated EU-wide payment system in the euro large-value segment (see Section 3.2.2). At the time the euro was introduced in 1999, a total of six LVPSs were operating in euros in the euro area. While TARGET and EURO1 covered the whole euro area, the other four were more localised (although with some foreign participation): EAF in Germany, PNS in France, SPI in Spain and POPS in Finland. EAF and PNS were hybrid systems, combining elements of both gross and net settlement systems; SPI was a multilateral net settlement system; and POPS is a system combining bilateral gross and net settlement. Three of these systems have since ceased operating: EAF (in November 2001), SPI (in December 2004) and PNS (in February 2008).

3.1.2 Retail payments: Single Euro Payments Area for infrastructure, processors and links

The market for retail payments in euros is far less integrated than the large-value payment segment. Retail payments are still based largely on national payment instruments and systems. While national payment systems may be cheap, very efficient and offer their users high levels of service when it comes to domestic payments, this is not yet the case for cross-border retail payments in the euro area, where processing procedures are more complex and levels of service are lower. However, fundamental changes will progressively occur in this area.

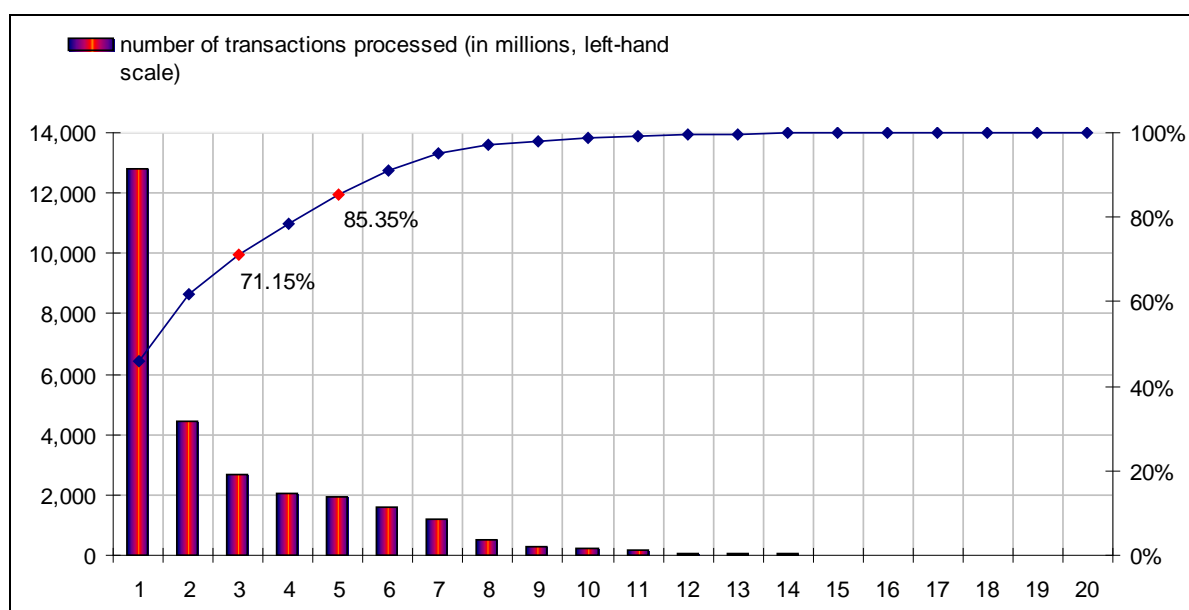
The list of euro area-wide retail payment systems is very short at present, but is expected to lengthen in the years to come. The two systems currently available on an area-wide basis, STEP1 and STEP2, were set up to complement the EURO1 system operated by EBA Clearing (see Section 3.2.2). STEP1 has been operational since November 2000 and complements EURO1 by providing a solution for the handling of retail and commercial payments (see Section 3.3.1). The STEP2 system (see Section 3.3.2) began operating in April 2003 and was developed as the first pan-European automated clearing house (PE-ACH) for bulk payments in euros, with a view to enabling cross-border payments in euros to be executed at low cost in compliance with Regulation (EC) No 2560/2001 on cross-border payments in euros.²⁶

Retail clearing and settlement are organised differently in the various euro area countries, reflecting their traditions and business preferences. Most national retail payment systems were originally developed using national standards and work well and efficiently within national borders. In some cases, the national clearing and settlement models are specific to the various payment instruments, while in others all transactions are centralised in a single infrastructure (eg in France and Greece). Most multilateral netting systems settle their balances in TARGET2. At the end of 2010 there were 20 retail payment systems in the euro area; in terms of concentration, the three largest systems processed 71% of the total market volume, and the five largest 85% (see Chart 4).

²⁶ Repealed by Regulation (EC) No 924/2009 of 16 September 2009 on cross-border payments in the Community.

Chart 4

Concentration of transactions processing among the 20 euro area retail payment systems, 2010



Source: ECB.

The integration of market infrastructures can be achieved in various ways. New area-wide systems could replace existing national systems, separate platforms could be consolidated to form a single platform, or platforms could be made interoperable. With a view to SEPA compliance, banks which receive and send national payments must also be able to receive and send payments on a euro area-wide basis. All banks must put in place the necessary arrangements, including a link to one or more SEPA-compliant CSMs. Each CSM, in turn, must be in a position to offer its clients euro area-wide reach, which means that it needs to be interoperable with other CSMs.

Interoperability is the ability of an infrastructure – whether directly or indirectly – to process payments between any two banks in the euro area (based on the rulebooks for SCT and SDD). The EACHA has established a technical framework to facilitate the interoperability of infrastructures, particularly as regards message formats, message flows, routing provisions, network and connectivity provisions and the mechanism for the settlement of inter-ACH transactions using TARGET2 as a settlement platform. In addition to the EACHA framework for the interoperability links between CSMs, another kind of connection has been developed for payments processed in STEP2; however, this system requires the direct or indirect participation of financial institutions. Numerous links and connections of these kinds have been set up between processors.

3.1.3 Card schemes

In the euro area, cards are now the most commonly used payment instrument in terms of transaction volumes. In particular, debit card transactions are now of great importance. This development has been supported by the existence of cheap and efficient national debit card schemes (some of which also offer credit card functionality), which are complemented by or co-branded with international card schemes.

While these national card schemes have a very strong market position in their respective countries, their weakness is that they have very little – if any – acceptance outside their

home country. Acceptance of a card in transactions outside the home country is therefore typically achieved by means of co-branding – ie the card bears, in addition to the logo of the domestic card scheme, the logo of one of the international card schemes.

Table 2
Card schemes operating in the euro area

National card schemes			
Name	Country	Name	Country
Bancontact/Mister Cash	Belgium	Sofinco ¹	France
EAPS (Euro Alliance of Payment Schemes)	Belgium	LaserCard	Ireland
JCC Payment Systems Ltd	Cyprus	CartaSi	Italy
Girocard/ATM	Germany	COGEBAN / PagoBancomat	Italy
4B	Spain	Bancomat	Luxembourg
Euro 6000	Spain	Cashlink	Malta
ServiRed	Spain	Premier	Malta
ACCORD ¹	France	Quickcash	Malta
Cartes bancaires	France	PIN	Netherlands
Cetelem ¹	France	SIBS	Portugal
Cofinoga ¹	France	Activa	Slovenia
Finaref ¹	France	Karanta	Slovenia
Franfinance ¹	France		

¹ Three-party schemes.

International card schemes

Four-party schemes		Three-party schemes	
Visa	UK	American Express	US
MasterCard	EU	Diners / Discover	US
China Union Pay	China	JCB	Japan

Many of the national card schemes and some international card schemes offer both debit and/or credit card functionality. Most national schemes offer co-branding with an international scheme.

Euro area citizens and retail merchants have benefited greatly from the availability of efficient and widely accepted debit card schemes. However, since those schemes are national in scope, many of them face great challenges in becoming SEPA-compliant. There is even a danger of schemes being closed down and replaced by card schemes that are more costly for their users. This is one of the reasons why the Eurosystem has recommended that the banking community consider ways to set up a European card scheme.

There are currently three initiatives for the creation of a European card scheme. The Euro Alliance of Payment Schemes is an initiative by selected scheme operators to interlink a number of existing ATM and POS schemes; PayFair is an independent bank and merchant-led initiative to establish a new SEPA-compliant payment card scheme; and Monnet is a

project of some large European banks to set up a new pan-European card scheme. All of the initiatives are still at an early stage.

3.1.4 Correspondent banking and group networks

The role of correspondent banking as a way of making large-value or retail payments has diminished and become more concentrated in the euro area since the launch of the euro. It is used much less than payment systems such as TARGET2. Nevertheless, correspondent banking in euros continues to be of significance, with banks both within and outside the euro area, complementing the use of payment systems in euros. There are signs of banks moving away from correspondent banking arrangements for small-value retail payments and into retail payment systems operating in euros. This is expected to continue with the full implementation of SEPA.

Group networks represent a special kind of correspondent banking service. In the late 1980s and early 1990s groups of banks established networks in order to reach local retail payment systems in a large number of countries and thereby facilitate their customers' cross-border payments. The largest of these networks are Eurogiro and TIPANET.

Eurogiro was established in 1989 as a partnership between postal and giro organisations and was restructured to form a holding company in 2007. It has entered into strategic partnerships with, inter alia, Visa, Western Union and the Federal Reserve System. Eurogiro processes credit transfers and cash transfer orders without any limit on the size of payments. In general, transactions are sent directly from member to member and are settled on a gross basis once a day bilaterally between the members concerned. Since November 2001 it has been possible to settle transactions in euros with a single settlement agent.

TIPANET is a network established in 1993 by cooperative banks and which ensures reach for retail payments destined for Europe, Canada, the United States and northern and sub-Saharan Africa. It processes credit transfers, direct debits and cheques. The local correspondent collects all payment instructions, creates payment batches and sends them to its foreign correspondents, which then process the payments in the relevant local payment systems. The settlement of payments takes place via existing reciprocal accounts.

Moreover, within many countries banking groups have developed their own networks for the exchange of payments between the banks concerned. For example, the savings banks of some countries have set up their own payment clearing networks, into which all (or a large part) of the payments effected between those savings banks are routed. The operation of such a network may be the responsibility of a central institution in the savings bank sector or may be outsourced to a service provider.

3.2 Large-value payment systems

3.2.1 TARGET2: the real-time gross settlement system

TARGET2²⁷ is the system for large-value and urgent payments in euros owned and operated by the Eurosystem. It plays a pivotal role in implementing the single monetary policy and in the functioning of the euro money market by offering a real-time settlement service in central bank money with broad market coverage. In the absence of any upper or lower value limit it has attracted a variety of other payments.

²⁷ Trans-European Automated Real-time Gross settlement Express Transfer system, second generation.

The system is based on a single technical infrastructure, the Single Shared Platform (SSP). Three Eurosystem central banks – the Bank of Italy, the Bank of France and the Deutsche Bundesbank – jointly provide the SSP and operate it on behalf of the Eurosystem.

TARGET2 is the second-generation RTGS system operated by the Eurosystem, replacing the former TARGET system which operated from the beginning of monetary union in 1999 until 2008. Unlike TARGET2, TARGET was based on a decentralised technical structure built by linking together the different RTGS components that existed nationally and defining a minimum set of harmonised features.

The move from a decentralised multi-platform system to a technically centralised platform made it possible for TARGET2 to offer harmonised technical and business services at EU level, ensuring a level playing field for banks across Europe, supported by a single price structure applicable to both domestic and cross-border transactions.

Besides the payment processing functionality offered in the Payment Module and the user-to-application interface called the Information and Control Module, the system also provides a number of optional modules. These modules are used, for example, to operate the standing facilities allowing banks to borrow from and make deposits with their Eurosystem central bank overnight, to manage the mandatory reserves to be held by the banks, or to manage the access of central banks to historical and statistical data. It is left to the individual central banks to decide whether to use the optional SSP modules or instead to offer these services via proprietary applications in their domestic technical environment.

3.2.1.1 Institutional framework

The rules governing TARGET2 and its operation can be found in the TARGET2 Guideline, which provides the basis on which the NCBs establish their TARGET2 component systems, governed by their national legislation.²⁸ It contains the main legal elements of TARGET2, including governance arrangements and audit rules. In addition, to ensure the maximum harmonisation of the rules applicable to TARGET2 participants in all the jurisdictions concerned, the Guideline includes conditions for participation in TARGET2. These conditions have been set out in a way that allows the Eurosystem NCBs to implement them in an identical manner, with certain derogations only in the event that national laws require other arrangements. This approach implements the decision of the Governing Council of the ECB in October 2005 to “legally construct TARGET2 as a multiple system, but aiming at the highest degree of harmonisation of the legal documentation used by the central banks within the constraints of their respective national legal framework”.

While in technical terms the SSP operates as a central platform, in legal terms the structure of TARGET2 is decentralised, ie each central bank operates its own RTGS system using the SSP and is fully responsible for the business and legal relationships with its customers.

A unique feature of TARGET2 is the possibility to extend its payment services beyond the euro area by offering NCBs and banking communities of member states which have not yet adopted the euro the possibility to connect to TARGET2. Such participation is possible on a “no compulsion, no prohibition” basis and subject to certain specific conditions which are defined in a TARGET2 Agreement with the Eurosystem. Under this agreement, such non-euro area member states must follow the rules and procedures of the system as defined in the TARGET2 Guideline. TARGET2 participation as defined in that Guideline becomes mandatory when a member state joins the euro area.

²⁸ Guideline of the European Central Bank of 26 April 2007 on a Trans-European Automated Real-time Gross settlement Express Transfer system (TARGET2), ECB/2007/2.

3.2.1.2 Participation

Several options are provided for access to TARGET2. These include direct and indirect participation, “addressable BICs” and “multi-addressee access”.

According to the TARGET2 Guideline and its Annex II, entitled “Harmonised conditions for participation in TARGET2”, only supervised credit institutions which are either established in the EEA or which, if they are established outside the EEA, act through a branch established within the EEA, can be admitted as direct participants. Furthermore, subject to approval by the relevant NCB, the following entities may be allowed to become direct participants:

- treasury departments of central or regional governments active in the money market;
- public sector bodies of member states authorised to hold accounts for customers;
- investment firms established in the EEA and supervised by a recognised authority;
- organisations managing ancillary systems acting in this capacity and supervised by a competent authority.

Credit institutions established in the EEA may enter into a contract with a direct TARGET2 participant in order to submit and/or receive payments and to settle them via the RTGS account of the direct participant. They will be published as indirect participants in the TARGET2 directory, which is available to all direct participants for information and routing purposes.

Other entities (eg correspondents or branches worldwide) holding a valid BIC which can be addressed via a direct TARGET2 participant can be registered as “addressable BICs” in the TARGET2 directory. Although technically there is no difference between an indirect participant and an addressable BIC, in legal terms only indirect participants are recognised as participants in TARGET2 and as such benefit from the protection of the Settlement Finality Directive.

Finally, with “multi-addressee access”, a direct participant is able to authorise branches and other credit institutions belonging to its group and located in the EEA to channel payments through the direct participant’s main account without its involvement, by submitting/receiving payments themselves directly to/from the TARGET2 system, which are settled on the account of the direct participant. This offers a direct participant’s affiliate banks or a group of banks efficient features for liquidity management and payment business.

At the end of December 2010, 866 direct participants held an account in TARGET2. Via these direct participants, 3,585 indirect participants from the EEA could settle their transactions in TARGET2, as well as 12,646 correspondents worldwide. Considering also the branches of direct and indirect participants, a total of 59,496 entities around the world were accessible via TARGET2.

3.2.1.3 Types of transactions

TARGET2 handles all payments directly connected with central bank operations where the Eurosystem is involved either as sender or recipient and the settlement operations of large-value net settlement payment systems operating in euros. For these two categories of payments the use of TARGET2 is mandatory. In addition, TARGET2 may be used to settle any other interbank or commercial payment which participants wish to process in real time using central bank money. There is no lower or upper limit placed on the value of payments.

Payments can be settled using the SWIFTNet FIN payment types MT 103/MT 103+, MT 202/MT 202COV and MT 204. Every payment order can be assigned a specific priority: normal, urgent or highly urgent. Participants can reserve liquidity for processing payments in different priorities. In addition, it is possible to provide payment orders with a debit time indicator, allowing a first or latest debiting time to be set.

TARGET2 provides a harmonised set of cash settlement services in central bank money for all kinds of ancillary systems, such as retail payment systems, money market systems, clearing houses, CCPs and SSSs. It offers different settlement models (eg bilateral/multilateral settlement, or batch/real-time processing) and has optional features like the setup of an information period before settlement takes place and the use of a guarantee account mechanism. This functionality, using standardised XML payment messages, is available via a dedicated Ancillary System Interface, part of the SSP Payment Module.

In 2010 TARGET2 settled transactions with a total value of € 593,194 billion, which corresponds to a daily average value of €2,299 billion. This represents an increase of 7.6% compared with 2009. In terms of volumes, a total of 88,591,926 transactions were settled in TARGET2 in 2010. This figure, which is stable compared to 2009, is equivalent to a daily average of 343,380 transactions.

3.2.1.4 Operation of the system and settlement procedures

TARGET2 is open for daylight processing from 7 am. to 6 pm CET on each of its working days, with a cut-off time of 5 pm for customer payments. In addition, TARGET2 starts the new settlement day in the evening of the current business day with next day's value. This so-called "night-time window" is available from 7.30 pm to 7 am the next day, interrupted by a technical maintenance period of three hours between 10 pm and 1 am. It facilitates the night-time settlement of different ancillary systems in central bank money with finality and supports cross-system DVP.

The system offers liquidity management features that allow banks, in particular multi-country banks, to further consolidate their internal processes, such as treasury and back office functions, and to better integrate their euro liquidity management. For example, participants are able to group some of their accounts and pool the available intraday liquidity for the benefit of all the members of the group. TARGET2 also offers its users liquidity-saving features and features to manage payment flows. Examples include payment queues, gridlock resolution mechanisms and priority and reservation features. Today, managers of cash and collateral want automated processes to optimise payment and liquidity management, as well as appropriate tools to monitor their activities and facilitate accurate funding decisions, preferably with the possibility of managing all of their central bank money flows from a single location.

A dedicated Ancillary System Interface exists for the settlement of ancillary systems. It offers ancillary systems a number of standardised procedures to settle their business in TARGET2. During the day in total six different procedures are available: (i) liquidity transfer, (ii) real-time settlement, (iii) bilateral settlement, (iv) standard multilateral settlement, (v) simultaneous multilateral settlement, and (vi) settlement using dedicated liquidity. Only the latter is available during the night-time settlement window.

Access to the features and information provided in TARGET2 is offered both in a user-friendly "internet-style" communication interface (Information and Control Module) and, for most of the functionality, in application-to-application mode using XML standard messages. Since November 2010 internet-based access to TARGET2 has been possible, which is especially useful for small and medium-sized banks as it offers direct access to the main TARGET2 services without requiring a connection to the SWIFT network.

3.2.1.5 Risk management

TARGET2 is a systemically important payment system, not only because it is the backbone for the settlement of payments in euros, but also because it contributes to the implementation of monetary policy and the settlement of ancillary systems such as LVPSs, SSSs and CCPs, and hence to overall financial stability. Therefore, in the design and development phase of TARGET2, close attention was paid to aspects of operational risk management and a

comprehensive risk management framework was developed. The framework is based on the internationally recognised standard ISO/IEC 27002 and has a hierarchical, three-layer structure which starts with a high-level information security policy, develops further into detailed security requirements and controls and is implemented in the form of guidelines and procedures.

As an RTGS system, TARGET2 by nature is a powerful tool to reduce settlement risk including, in particular, credit, liquidity, operational and legal risk. Its settlement in central bank money and the immediate finality of its real-time settlement process makes it an important enabler of DVP-based transaction processing (ie by handling the cash leg of securities transactions). Furthermore, by providing standardised settlement procedures for ancillary systems including features allowing for the use of liquidity/collateral pools, it offers systems settling in TARGET2 additional tools to reduce both credit and liquidity risk.

Particular attention has been given to the reduction of operational risk within TARGET2. Besides the establishment of the system based on a “two regions – four sites” concept, with two permanently staffed sites and rotating responsibility for live operation, a full set of operational procedures for normal and abnormal circumstances including business continuity and contingency scenarios has been agreed, and is actively maintained and tested regularly. Finally, for critical participants, dedicated obligations regarding the technical setup and for testing and reporting are in place with the aim of reducing the likelihood of systemic impact on the TARGET2 system as a result of a failure on a (critical) participant’s side.

The way in which TARGET2 was implemented and its institutional framework (see Section 3.2.1.1) contribute to a high level of legal certainty. Sound rules covering, inter alia, payment irrevocability and finality are in place, thus reducing legal risk for the system as a whole and its participants.

TARGET2, like any other euro LVPS, is subject to oversight, based on the CPSS “Core Principles for Systemically Important Payment Systems”²⁹ and the Eurosystem “Business continuity oversight expectations”.³⁰

3.2.1.6 Pricing

The pricing for TARGET services is based on a non-profit-making cost recovery principle for investment, capital, operating and overhead costs, with the exception of a “public good factor” corresponding to the positive externalities generated by the system (ie in terms of reduction of systemic risk). Participants can choose among two pricing schemes: either to have a low monthly fee with a flat transaction fee (Option A) or a slightly higher monthly fee in combination with a (volume dependent) degressive transaction fee (Option B). The latter option will be more favourable for participants generating a large traffic volume. The pricing scheme for the TARGET2 core service for direct participants is set down in Table 3 below.

In addition, direct participants pay a monthly fee for each BIC used for multi-addressee access (in addition to the direct participant’s BIC) and are charged a one-off registration fee of €20 for each registration of an indirect participant and €5 for each registration of an addressable BIC (including BICs of branches of direct and indirect participants) in the TARGET2 directory. Banks using internet-based access and which participate as direct participants use pricing option A, but to recover costs for this access channel their monthly fee is €170.

²⁹ CPSS Publications No 43, January 2001.

³⁰ *Business continuity oversight expectations for systemically important payment systems (SIPS)*, ECB, June 2006.

The liquidity pooling service (aggregated liquidity option and consolidated information option) is an optional and separately priced core service. It is charged at €1,200 per account per annum for the consolidated information option and €2,400 per account per annum for the aggregated liquidity option (which includes the consolidated information option). Furthermore, within a group of accounts (with either the consolidated information option or the aggregated liquidity option) group pricing applies, which means the regressive transaction fee is applied to all payments of the group as if they were sent from one account.

A separate pricing scheme applies for ancillary systems interacting with TARGET2.

Table 3

Fee scheme for TARGET2 core services

Option A			
Monthly fee	€100		
Flat transaction fee	€0.80		
Option B			
Monthly fee	€1,250		
	Volume		
Band	from	to	Price
1	1	10,000	€0.60
2	10,001	25,000	€0.50
3	25,001	50,000	€0.40
4	50,001	100,000	€0.20
5	above	100,000	€0.125

3.2.1.7 Major future projects

The Eurosystem pays close attention to the development and continuous evolution of TARGET2 beyond the annual releases, with the aim to meet market demands and fulfil the objectives of TARGET2 under the principle of full cost recovery. During 2010 the Eurosystem started work on a strategy for increasing the use of the ISO 20022 standard in TARGET2. ISO 20022 has been at the core of discussions in the financial industry for the past few years, as it aims to increase the efficiency and the interoperability of financial institutions, market infrastructures and end users. Besides the general advantages that ISO 20022 may bring in terms of efficiency and interoperability, given the close linkages between TARGET2 and other Eurosystem projects such as T2S, which will also make use of ISO 20022, increasing the use of the standard in TARGET2 would ensure smooth interoperability between those services and TARGET2. The Eurosystem has proposed a number of implementation steps, starting from 2013. Discussions with market participants are ongoing on the detailed technical aspects of implementation.

3.2.2 The EURO1 system

3.2.2.1 Institutional framework

The EURO1 system is a privately owned LVPS operating on a multilateral net basis for payments denominated in euros, which settles its end-of-day balances in central bank money via TARGET2-ECB. EURO1 is governed by the EBA Clearing Company, a limited liability

company incorporated under French law in the form of a société par actions simplifiée. EBA Clearing is entrusted with the operation and management of EURO1. It has its registered office in Paris and its shareholders (67 major European and international banks) are the participants in EURO1.

The EURO1 system is governed by the EURO1 system documentation, which includes the EURO1 rules. The EURO1 rules, as well as all other EURO1 system documents, are governed by German law. In particular, the “Agreement for participation and provision of funds transfer services in TARGET2-ECB for settlement of EURO1” is also governed by German law. The EURO1 system is overseen by the ECB.

EURO1 operates on the basis of the legal concept called the “Single Obligation Structure”, which applies at a cross-border level in all jurisdictions relevant to the system. Each participant, at any time during the operating day (and beyond the cutoff time for processing until settlement), has one single claim (in the case of a positive balance) or one single obligation (in the case of a negative balance) towards the community of all other participants.

3.2.2.2 Participation

In order to be eligible for admission to or to participate in the EURO1 system, the participant (or applicant) must fulfil certain legal, financial and operational criteria. The applicant or participant must:

- be authorised to conduct banking business;
- have its registered office in a member state of the OECD or in an EU member state;
- participate through a system office which is either its registered office or a branch in the EU;
- have direct access to TARGET2;
- have own funds of at least €1.25 billion (within the meaning of the Banking Directive³¹);
- have a short-term credit rating of at least P2 (Moody’s) or A2 (Standard & Poor’s) or equivalent;
- adhere to and agree to be bound by the provisions of the EURO1 rules and the other EURO1 system documentation;
- provide adequate technical and operational facilities which meet the technical specifications laid down by EBA Clearing and whose operational reliability and robustness should be certified by EBA Clearing;
- notify EBA Clearing of branches, offices and subsidiaries located in the EU when applying to be included as sub-addresses of a EURO1 participant;
- be a member of the EBA, which is an association under French law acting as a forum for exploring and debating all issues of interest to its members, in particular issues related to euro payments and the settlement of transactions in euros.

In addition, the participant (or applicant) should provide a legal opinion to substantiate its ability to participate in the system (capacity opinion) and to confirm that the Single Obligation Structure is recognised and enforceable in the country in which the participant is incorporated and/or its system office is located (country opinion).

³¹ Directive 2006/48/EC of 14 June 2006 relating to the taking up and pursuit of the business of credit institutions (recast), OJ L177 30.6.2006, p.1.

Concerning participation in the system, the EURO1 rules distinguish between two types of participants, namely EURO1 participants and pre-fund participants. EURO1 participants must fulfil all admission criteria and participate in the system's loss-sharing arrangements. Pre-fund participants are not required to fulfil the financial admission criteria and can only have a positive position (ie single claim) in the system. The pre-fund participant status in EURO1 is currently only available for sending and receiving payment messages for the purpose of settlement of certain STEP2 services. Central banks are eligible to be admitted as pre-fund participants.

The system design allows a EURO1 participant to have multiple access points to the system. A EURO1 participant can have up to 99 sub-addresses under its main BIC address which it can assign to its branches or to entities incorporated in the same consolidated accounts as the EURO1 participant. Entities (ie excluding branches) included as sub-addresses are often referred to as "sub-participants".

In mid 2011 there were 67 EURO1 participants and 10 pre-fund participants, of which seven were central banks, and 58 sub-participants.

3.2.2.3 *Types of transactions*

EURO1 processes credit and debit transfers. In particular, EURO1 supports the following SWIFT message types: MT103 (CORE, PLUS, REMIT), MT202 (including MT202COV), MT400 and, provided limits authorising receipt have been set by the participants, MT204. Although there are no restrictions as regards the value or the originator of the transactions processed, EBA Clearing, when developing the system, intended EURO1 to focus primarily on processing large-value payments in euros.

In 2010 the daily average volume of payments processed in EURO1 was 230,121, and the daily average value was €240 billion.

3.2.2.4 *Operation of the system and settlement procedures*

SWIFT provides the messaging infrastructure for EURO1 and acts as processing agent. Payment messages are sent by the participants to EURO1 via the SWIFTNet FIN network. The EURO1 messages must carry the tag "EBA" in field 103 of the message header. Messages with this tag are automatically copied (Y-copy) to the central computer via SWIFT's FIN copy service. Once the messages are processed they are immediately forwarded via the SWIFTNet FIN network to the receiving bank. The continuous calculation of the single obligation or claim of each EURO1 participant is carried out by the processing system operated by SWIFT.

The EURO1 system operates on weekdays (except TARGET2 holidays) from 7.30 am CET to 4 pm CET. Payment messages are processed on an individual basis. The technical features of EURO1 are such that payment messages are only processed by the central computer after it has been checked that these meet the criteria for being processed. In particular, these criteria include that a payment message can only be processed if this does not lead to a breach of binding intraday limits – corresponding to the debit caps and credit caps of the respective participants – built into the system. Payment messages that cannot be processed at the time they are sent are queued. The queues are revisited each time a payment message in relation to the sending or receiving bank, as applicable, is processed to check whether the adjusted balance allows the further processing of payment messages held in a participant's "on-hold" queue. To that effect, the system follows the principle of "bypassing FIFO". In addition, a circles processing function is available allowing for the simultaneous processing of a number of payment messages from different participants, which, if processed simultaneously, will not breach the applicable debit caps and credit caps.

A payment message can be revoked or cancelled by the sending participant as long as it has not been processed. Once processed, payment messages cannot be revoked. All payment messages that are still on hold at the EURO1 processing cutoff time (4 pm CET) will be

automatically carried over to the next valid value date, unless cancelled by the sending EURO1 participant.

The above operations are monitored and administered by EBA Clearing staff. The hardware and software used by EBA Clearing for the management of EURO1 is duplicated at a parallel-running site located in a different country. At participant level, EURO1 participants have real-time access to their position at any given time in the day, including inter alia the monitoring and management of payments and queues.

The EURO1 system settles the same day in central bank funds via a settlement account opened with the ECB in TARGET2-ECB using the Ancillary System Interface settlement procedure ("ASI4"). Settlement of the EURO1 system concerns the settlement of the single amount, ie the single claim or the single obligation of each participant towards the community of all other participants.

After the cutoff time for processing at 4 pm CET, the EURO1 (short) participants having a single obligation will pay the amount, by means of a transfer via direct debit from their account held in a component system of TARGET2, crediting the settlement account for EURO1. After all amounts have been received, the single claim of each (long) participant is satisfied by means of a transfer from the settlement account for EURO1 to the (long) participant's account in TARGET2. Completion of settlement is notified to all participants upon receipt of confirmation that the TARGET2 account of each of the long participants has been credited. The average settlement completion time from settlement using TARGET2-ASI4 is 4.08 pm CET. In TARGET2-ASI4, a guarantee fund account has been created through which additional liquidity (ie the liquidity pool or, if needed, additional funds transfers by the surviving participants) can be moved to ensure completion of settlement, even in the event of a shortfall owing to the inability of one or more participants to meet their settlement obligations.

3.2.2.5 Risk management

Payments sent to EURO1 are processed individually and, once they have been processed by the system, cannot be cancelled. EURO1 provides immediate intraday finality for each payment upon processing; the time of irrevocability of each payment coincides with the point in time at which an irrevocable and unconditional funds transfer takes place. Each processed payment leads to an adjustment of the single claim or obligation of the participant. However, settlement of the single claim or obligation occurs only after the cutoff time at 4 pm CET. In EURO1, the transfer of the settlement asset, ie central bank funds transfers across the settlement account for EURO1 in TARGET2-ECB, takes place after the payments are final. The participants continue to be subject to certain credit and liquidity risks in relation to their single claim or single obligation towards the community of all other participants until final settlement in central bank money is completed. To handle abnormal events in EURO1 that may endanger the smooth functioning of the system and daily settlement, EBA Clearing has put in place a number of risk management procedures and tools:

- Setting of bilateral limits: each participant must establish limits for all other participants individually (varying from a mandatory minimum of €5 million to an additional discretionary limit of up to €25 million, amounting to a maximum of €30 million bilateral risk per participant). Participants can change the discretionary part of the bilateral limits on a daily basis until 6 pm CET on T-1 in accordance with their own risk management policy, eg the assessment of counterparties' creditworthiness. The setting of the mandatory element to zero is valid only if the majority (>51%) of the participants carry out the same action.
- Application of debit and credit limits: on the basis of the bilateral limits, the system determines for each participant the multilateral debit cap (sum of limits received from the other participants) and the multilateral credit cap (sum of limits given to the other participants). These multilateral debit and credit caps per participant, which in order

to limit systemic risk are capped at €1 billion, are binding throughout the operating day.

- Circles processing function: activated by EBA Clearing in the case of threatened gridlock. The process consists of the continuous checking of the sending and receiving participants' positions (ie single obligations/single claims) resulting from the processing of payment messages. Upon activation, the function enables a number of payment messages from different participants to be processed simultaneously, and thereby not breach the applicable multilateral debit or credit caps. No payment order that would cause a breach of a participant's credit or debit limits is processed by the system at any time.
- Liquidity and loss-sharing arrangements: such arrangements have been established to cope with liquidity and credit risk situations that may arise owing to failure by one or more participants to meet its or their obligations on time. First, in order to cope with a failure by a participant to transfer funds for settlement purposes, readily available liquidity has been put in place – in the form of a liquidity pool held with the ECB – to ensure timely completion of settlement. Second, the liquidity pool can be used in the event of multiple failures up to the aggregate amount held therein. Moreover, additional liquidity resources – in the form of same-day liquidity provided by the surviving participants – cover any shortfalls stemming from multiple failures if the amount required exceeds the balance available in the liquidity pool with a view to achieving same day settlement. The system's architecture allows for same day settlement even in the event of multiple failures occurring on the same day (including in the case of a so-called market crisis scenario). The establishment, maintenance and activation of the liquidity pool at the ECB are governed by the deposit agreement between the ECB and EBA Clearing for the benefit of the banks participating in EURO1 as third-party creditors.
- Liquidity bridge: a liquidity management arrangement, which consists of two phases. During the pre-funding phase, each EURO1 participant can inject, at all times during the processing hours (until 3.30 pm CET), additional liquidity from its TARGET2 account to the pre-settlement EURO1 account held at the ECB to increase its position in the system. Payment capacity can be shifted from EURO1 to TARGET2 at six predefined distribution windows (the window distribution phase), namely at 11 am, 12 noon, 1 pm, 2 pm, 3 pm and 3.30 pm CET. The intraday withdrawal of processing capacity from EURO1 to TARGET2 is available only to EURO1 participants that have agreed to receive funds intraday and are entitled to distribution. In order to be entitled, a EURO1 participant has to set a daily distribution limit on the total amount which it accepts to receive intraday on its TARGET2 account, at least one day before settlement. Each entitled EURO1 participant is also required to set a limit on the amount which it accepts to receive on a "per distribution window" basis. Once these two preconditions are met, EBA Clearing calculates the distribution entitlements for the entitled participants so that the maximum number of EURO1 payments on hold (queued) can be processed.

3.2.2.6 Pricing

The objective of the pricing policy in EURO1, which has been agreed with its shareholders, is to recover all costs in relation to the processing service provided by SWIFT and the settlement service provided by the ECB. The pricing policy also covers the operational, administrative and depreciation costs incurred at the level of EBA Clearing in relation to the administration of EURO1 and new developments in the system. The annual operating charge of the processing agent (SWIFT) and the operating costs of EBA Clearing are shared among the EURO1 participants on a quarterly basis in accordance with a special distribution key.

The transaction charges in EURO1 are based on the number of payments sent by participants in accordance with a degressive scale, providing an incentive for participants to use the system. The pricing policy applicable to pre-fund participants, whose use of the system typically involves lower volumes, includes a connection fee after admission and a total annual fee per calendar year payable on a quarterly basis. The annual fee also covers the per transaction costs for sending payment messages.

3.2.2.7 Major future projects

EBA Clearing is currently analysing various proposals for changes to EURO1. These include the migration of payments processing to XML format (ISO 20022) and other changes in the light of lessons learned from the recent financial crisis. With regard to the latter, EBA Clearing is considering moving forward the cutoff time for changes to the discretionary part of the bilateral limit-setting to the morning on day D, and changing the minimum and maximum amounts of the bilateral limits by setting a lower minimum for the mandatory limit and a higher maximum for the discretionary limit. It is also envisaged that the circles processing functionality will be enhanced and partially automated, with automatic circles processing activation at regular intervals in addition to manual activation on monitoring by EBA Clearing.

3.2.3 Continuous Linked Settlement

The CLS system settles gross-value payment instructions related to foreign exchange (forex) transactions with multilateral net funding on a PVP basis. The PVP mechanism ensures the synchronous settlement of the two legs of a foreign exchange trade. Established in 2002, CLS initially settled payment transactions related to the seven most widely traded currencies. Today 17 currencies are eligible for settlement via its infrastructure and it has become the largest cash settlement system in the world. The euro is the currency with the second largest market share in the CLS PVP service.

Given the multicurrency nature and systemic relevance of CLS, a cooperative oversight arrangement has been entered into by the Group of Ten (G10) central banks, the ECB and the central banks whose currencies are settled in CLS. Such cooperative oversight is organised according to a Protocol endorsed in November 2008 whereby the Federal Reserve System acts as primary overseer. The Protocol provides a mechanism for the cooperating central banks to carry out their individual oversight responsibilities in pursuit of the shared public policy objectives of the safety and efficiency of payment and settlement systems and the stability of the financial system. Under the Protocol, the primary forum for the cooperating central banks is the CLS Oversight Committee, which is chaired by the Federal Reserve System. The Eurosystem is represented in the Committee by the ECB – which is the central bank with primary oversight responsibility for the settlement in euros by CLS – and the other G10 euro area NCBs, ie the National Bank of Belgium, the Deutsche Bundesbank, the Bank of France, the Bank of Italy and the Netherlands Bank.

Besides its unique PVP settlement services, CLS also offers settlement services related to single currency transactions (non-PVP transactions), which mainly include non-deliverable forward and credit derivative transactions. The Eurosystem monitors the turnover of non-PVP settlements in euros with regard to CLS's compliance with its location policy. Such turnover on a daily average (calculated over a 12-month period) remains small, far below the threshold set by the Eurosystem for the application of its location policy rules.

The CLS system is described in more detail in the descriptive Red Book chapter on international payment arrangements.

3.3 Retail payment systems

3.3.1 The STEP1 system

3.3.1.1 Institutional framework

STEP1 has been developed to handle retail and commercial payments. It is implemented on the same technical platform as the EURO1 system and is based on the use of certain processing functionalities of EURO1. The STEP1 arrangement entered into operation on 20 November 2000. It is managed and operated by EBA Clearing.

Since its implementation STEP1 has enabled the execution time and the cost of domestic and cross-border retail and commercial payments in euros to be reduced. Furthermore, STEP1 has fostered the use of industry standards for messaging in order to enhance straight through processing (STP) within banks, as well as the adoption of harmonised business practices in the execution of retail and commercial payments in euros.

3.3.1.2 Participation

The STEP1 arrangement is open to all banks that have an office located in an EU member state from where they connect to STEP1 (a “system office”) and that are either EURO1 banks or have appointed a EURO1 bank to act as their settlement agent within EURO1. For a bank to become a STEP1 participant, it must also be a member of the EBA. There is neither a minimum credit rating nor a minimum own funds requirement. STEP1 participants may include their branches and subsidiaries as sub-addresses, which are often referred to as “sub-participants” in the system.

As at mid-2011, 93 banks were participating in the STEP1 arrangement as participants, and 47 as sub-participants.

3.3.1.3 Types of transaction

STEP1 can be used for the processing of credit and debit transfers. The following SWIFT payment messages are used in STEP1: (i) MT103 (Core, PLUS and REMIT), (ii) MT202 (including MT202COV), (iii) MT204 and (iv) MT400. Use of the MT103 REMIT is subject to a bilateral agreement between the sending STEP1 participant and the receiving STEP1 participant. The capacity transfer messages – which are credit transfer messages or direct debit messages sent between a settlement bank and its STEP1 bank for the purpose of increasing the sending and receiving capacity of the STEP1 bank – are SWIFT message types MT202 and MT204 respectively.

In 2010 the daily average volume of payments processed in STEP1 was 18,346 and the daily average value of these payments was €894 million.

3.3.1.4 Operation of the system and settlement procedures

STEP1 is set up such that a STEP1 bank (ie a STEP1 participant which is not at the same time a participant in the EURO1 system) is able to submit payments to and receive them from other STEP1 participants directly, using sending and receiving capacity provided by a EURO1 participant, which is termed its “settlement bank”. A credit cap is allocated by the settlement bank to the STEP1 bank, and the amount of the STEP1 bank’s credit cap is deducted from the amount of the credit cap of the settlement bank in EURO1 during the STEP1 processing day (ie until the processing of all STEP1 payment messages for the STEP1 bank is completed). The sending capacity of a STEP1 bank is created by incoming payment messages and by the transfer of liquidity by an MT202 transfer from the settlement bank to the position of the STEP1 bank. Additional receiving capacity for a STEP1 bank, as and when needed to reduce its position below the amount of its credit cap, is created by an MT202 liquidity transfer by the STEP1 bank to its settlement bank or by an MT204 direct debit transfer by the settlement bank from the position of the STEP1 bank.

STEP1 uses the technical platform of EURO1 for the processing of payments. In order to distinguish STEP1 payments from EURO1 payments, the former carry a specific three-letter tag in field 103 of the SWIFT message (“ERP” for euro retail payment). A payment with an ERP tag is automatically captured by SWIFT, which forwards a partial copy of the message to the EURO1 platform.

The processing of STEP1 payments is carried out according to the same technical processing principles as for EURO1. However, for STEP1 banks, processing relies on the use of sending and receiving capacity that is provided by EURO1 participants acting as settlement banks. STEP1 operates on weekdays (except TARGET2 holidays) from 7.30 am CET to the close of processing at 4 pm CET. The cutoff time for sending is 2.30 pm CET. Shortly after 2.30 pm CET, SWIFT informs each STEP1 bank, and its settlement bank, of its potential net balance. This is the total value of payments to be received on day T minus the total value of payments to be sent on day T for which processing is pending at 2.30 pm CET. A capacity transfer between the settlement bank and the STEP1 bank must take place before 4 pm CET to allow processing of the remaining STEP1 payment messages. Normally, processing of STEP1 payment messages ends with all STEP1 banks having a zero position and no STEP1 payment messages still on hold. If, in exceptional circumstances (eg major technical failures or unavailability of sufficient sending or receiving capacity at the end of the STEP1 operating day), STEP1 payments cannot be processed by 4 pm CET on day T, unprocessed STEP1 payment messages are automatically carried over to the next settlement day.

3.3.1.5 Risk management

STEP1 messages are irrevocable as soon as they are processed. Payments exchanged in STEP1 are for amounts that do not create the need for systemic risk protection. However, to mitigate risk, sending and receiving capacity limits are set for each participant in the system. A credit cap applies with a minimum of €2 million and a maximum of €50 million. If STEP1 messages exceed the sending capacity of the sending bank, or the receiving capacity of the addressee, they are queued by the system.

A debit cap also applies, which is always set at zero. Therefore, a STEP1 bank’s position resulting from processed payment messages cannot be negative.

Finally, for STEP1 payment messages not yet processed at the cutoff time for sending, a capacity transfer must be made to allow them to be processed before the close of the STEP1 operating day.

3.3.1.6 Pricing

STEP1 banks pay a fee for connection to the system. Transaction charges are based on an incremental scale according to the number of payments sent. A minimum quarterly transaction fee applies for very low volumes.

3.3.1.7 Major future projects

No major changes to STEP1 are envisaged for implementation in the near future.

3.3.2 The STEP2 system

3.3.2.1 Institutional framework

STEP2 is a PE-ACH for retail payments in euros. It is managed and operated by EBA Clearing. The first cross-border credit transfer service (XCT service) was launched in 2003 for processing credit transfers that comply with the convention on credit transfers in euros in accordance with the requirements of Regulation (EC) No 2560/2001 on cross-border payments in euros. With the launch of the SEPA Credit Transfer Scheme in January 2008

and the SEPA Direct Debit (SDD) Scheme in November 2009, STEP2 started new services processing SEPA Credit Transfers (SCT service) and SEPA Direct Debit payments (SDD services). In addition, since 2006 STEP2 has offered a service for the processing of domestic credit transfers which is currently used by major Italian banks, namely the STEP2 Italian credit transfer service (ICT service). A STEP2 Irish transfer service (IET) is expected to commence operation by end-2011. Each STEP2 service has its own set of service documentation with separate technical and legal provisions.

Depending on the services used, the final settlement of the payments takes place either in EURO1 (XCT service) or TARGET2 (SCT and SDD services). The final settlement of payments for the ICT service takes place both in EURO1 and in BI-COMP (the clearing system managed by the Bank of Italy). The settlement of payments is in all cases protected by the Settlement Finality Directive, either indirectly via the designation of the EURO1 system under the Directive or directly via the designation of the STEP2-T system, ie the technical and legal component of STEP2 which processes transactions that are finally settled in TARGET2.

Like the other payment systems operated by EBA Clearing (EURO1 and STEP1), STEP2 is subject to the oversight of the ECB. The ECB classifies STEP2 as a prominently important retail payment system in accordance with the Eurosystem's oversight standards for euro retail payment systems and, consequently, STEP2 has to comply with six Core Principles.

3.3.2.2 *Participation*

Depending on the STEP2 services that they use, participants must meet different requirements. In all cases, only credit institutions and central banks can become participants of STEP2. As well as direct participation, indirect participation is also possible. Direct participants have the right to send and receive STEP2 files and are obliged to pay fees and provide settlement accounts and funds. Indirect participants, which may be credit institutions or institutions authorised to conduct money transfers, are, upon inclusion in the STEP2 directory, recognised by the STEP2 system as addressees of payment instructions. The relationship between a direct participant and an indirect participant is exclusively governed by their bilateral arrangements, and direct participants are responsible for ensuring that the indirect participants comply with the STEP2 system rules. While the term "indirect participants" is currently used, indirect participants are not actually participants in STEP2 but are recognised by the system as reachable, ie through given direct participants and, in the case of the STEP2 SEPA services, also through a network of over a dozen interoperable CSMs.

Admission as a participant to the STEP2 SCT and SDD services is reserved for credit institutions that have the status of a direct or indirect participant in TARGET2 and have access to the necessary accounts for the TARGET2 Ancillary System Interface settlement procedures which are initiated by STEP2, and for central banks that have the status of a TARGET2 direct participant. Participants must have a registered office or branch within SEPA. Moreover, they must sign the adherence agreements for admission to the SEPA schemes and successfully complete the testing programme. As at mid-2011 there were 123 direct participants using the SCT service and 4,516 indirect participants. The STEP2 SDD services – the Core and B2B services (see below) – had 89 (3,825) and 66 (3,287) direct (indirect) participants respectively in mid-2011.

3.3.2.3 *Types of transaction*

STEP2 processes different kinds of retail payments. The STEP2 XCT service processes credit transfers bearing, among other information, the IBAN of the beneficiary and the BIC of the beneficiary's bank. In July 2011 the daily average volume of XCT transactions was 150,237 with an average daily value of €713 million (the XCT service is planned to be withdrawn in December 2011).

The STEP2 ICT service processes credit transfers in the same format as XCT transactions and also in the Italian domestic technical format. Both formats are based on the SWIFT MT103+ message structure.

The STEP2 SCT service offers financial institutions an interbank processing service which routes, delivers, clears and settles SEPA Credit Transfers to all banks in Europe, using a secure and reliable framework that complies with the EPC SCT Scheme Rulebook and Implementation Guidelines as well as with the CSM Framework, using standard banking interfaces and global ISO XML standards.

STEP2 also processes on its platform direct debits that comply with the SDD Core and SDD B2B Scheme Rulebooks and the Implementation Guidelines of the EPC respectively. These services are the SEPA Core Direct Debit Service for consumer direct debits and the SEPA B2B Direct Debit Service for business-to-business direct debits.

The technical standard used for SEPA transactions is the UNIFI ISO 20022 XML message schema.

As well as basic services for the processing of SEPA transactions, if requested by national or other banking communities STEP2 also offers tailored services for the clearing of payments.

3.3.2.4 Operation of the system and settlement procedures

For the technical operation of STEP2's central system, EBA Clearing makes use of SWIFT and Italian payment and network services provider SIA. SWIFT provides calculation services and the interface with TARGET2-ECB for settlement. SIA acts as a processing agent. Two systems are provided: a primary system and a secondary system. Both systems benefit from business continuity arrangements. A changeover from the primary to the secondary site can take place with no risk of undetected data loss or duplication. Direct participants can exchange files with the STEP2 central system and perform enquiries over two secure network connections: SWIFTNet and SIANet. The business operation of the system is controlled by EBA Clearing. A secure business control terminal is provided at EBA Clearing's operational centres, allowing EBA Clearing to monitor and control the business processing of the system. The technical operation of the system is controlled by SIA using terminals directly connected to the STEP2 central system. Multiple language helpdesks are provided by EBA Clearing as well as SIA to assist direct participants with business and technical enquiries. The operating days of STEP2 are the days on which the TARGET2 system is open for business.

The STEP2 platform is scalable and is thus capable of processing more than 50 million payments per day. It is built using the latest technology as well as global ISO XML standards and it features interactive web services. STEP2 processing includes the STP validation of payment instructions, their routing to the beneficiary banks and automated settlement.

STEP2 is designed to ensure one or more settlement cycles per value date. Each settlement cycle consists of a sending cutoff time, a settlement time and a settlement cutoff time. Different STEP2 services have different numbers of settlement cycles, settlement times and settlement procedures. For example, the STEP2 SCT service has two daytime cycles. Cycle 1 allows participants to send files up to 1 am CET for overnight processing and settlement at 7.30 am CET in TARGET2, and to receive incoming payment files by 9 am CET on day D. Cycle 2 is an intraday cycle allowing participants to send files up to 1 pm CET for settlement at 2 pm CET, and to receive incoming payment files by 3 pm CET on day D. In addition to the two daytime cycles, STEP2 SCT offers an optional night-time clearing and settlement cycle, which enables banks to send their payments until 1 am CET, with settlement being completed at 1.45 am CET and file delivery ending at 2.45 am CET. Additional cycles can be added as and when there is demand, and there are plans to add additional daytime and night-time cycles at the beginning of 2012. In February 2011 the daily average volume of SCT transactions was 1,401,328 with an average daily value of €4.96 billion.

3.3.2.5 Risk management

EBA Clearing applies several different measures to avoid or mitigate potential risks to the system or the system participants. Many of the risk management measures, ie those directly related to oversight requirements, are also assessed by the ECB. Thus financial risks (credit and liquidity risks) are managed by the admission requirements for the system – namely only banks that are subject to banking supervision and central banks are allowed to become participants in STEP2 and only risk-free central bank money can be used to settle all transactions. Operational risk is managed by using two operational systems that provide backup for each other and by the clear description and application of operational procedures. To avoid legal risks, EBA Clearing provides comprehensive documentation of the system and its procedures, including a clear description of the responsibilities of the parties involved.

3.3.2.6 Pricing

The fees charged in connection with participation in the STEP2 SEPA services are: a connection fee, fees for membership changes, an annual fee and a fee for incoming and outgoing transactions. Information on these fees is made available to each applicant for direct participation in the services and fees are typically set on a yearly basis. Since EBA Clearing has no contractual or direct relationship with indirect participants, who only have a contractual relationship with a direct participant, all fees in relation to indirect participants are invoiced to and payable by the corresponding direct participants. The inclusion of indirect participants is subject to a connection fee and an annual fee to cover administrative costs, which are invoiced to the direct participant.

3.3.2.7 Major future projects

EBA Clearing announced that the Irish banking community has decided to use the STEP2 platform for processing its domestic payments in the future. This move to EBA Clearing's PE-ACH, which is envisaged for autumn 2011, should facilitate the Irish banks' migration to SEPA. The service for the Irish banking community will involve the introduction of clearing and settlement for "bilateral file exchanges", ie the files processed in STEP2 will contain the information required to settle amounts resulting from the exchange of underlying payment transactions, which occurs bilaterally between the banks concerned (ie they are not processed on the STEP2 central platform). Moreover, the Finnish banking community, which already uses STEP2 for part of its domestic traffic, also plans to fully migrate to SEPA formats and to STEP2. In that context, STEP2 is considering the development of a new feature for Finnish banks that would enable urgent payments to be processed within one hour.

4. Systems for post-trade processing, clearing and settlement of securities and derivatives

4.1 General overview

4.1.1 Towards more integration

Most market infrastructures for post-trade processing, clearing and settlement of financial instruments in the euro area were originally created to meet domestic needs. Thus, the euro area infrastructure has suffered from fragmentation, resulting in inefficiencies and high costs, especially for cross-border transactions. In short, the euro area market infrastructure for financial instruments has not yet reached a level of efficiency, integration and soundness compatible with the requirements of the single market and the single currency.

There are various ways of achieving a more integrated and efficient European financial market. On a conceptual level, the establishment of euro area-wide integrated services for payments and financial instruments means that participants: (i) are subject to a single set of rules; (ii) have equal and open access to the services in question; and (iii) are treated equally when using those services.

This means that integration concerns issues such as standardisation, harmonisation (ie common rules, standards and business practices), interoperability and/or the consolidation of systems. Among other things, financial integration typically facilitates competition and creates economies of scale.

Financial development involves a process of financial innovation and organisational improvement that renders markets more complete, increases agents' options when engaging in financial transactions, improves market transparency, reduces transaction costs and increases competition.

The Eurosystem's statutory task of promoting the smooth operation of payment systems means that it has a keen interest in furthering the integration of the euro area market infrastructure for payments and post-trading services for financial instruments. It does so in its complementary roles as operator, overseer and facilitator.

As owner and operator, the Eurosystem provides the TARGET2 system, which has become the benchmark for the processing of euro payments in terms of speed, reliability, opening times and service levels. Counterparties throughout the euro area can transfer central bank funds directly to each other with immediate intraday finality. Another important Eurosystem service contributing to the integration of the money market is the CCBM, which allows the cross-border transfer of collateral within the euro area in Eurosystem credit operations. Moreover, with its T2S initiative, the Eurosystem is setting up a neutral single settlement platform with a view to fully integrating all settlement activities and thereby making cross-border settlement as cheap and efficient as domestic settlement.

As overseer, in order to ensure equal treatment, the ECB and the Eurosystem as a whole apply the same oversight policies to all systems – ie both private systems and those operated by the central banks themselves. In this context, reference can be made to the ESCB-CESR recommendations for SSSs and CCPs in the EU which are used by authorities with a view to ensuring both the soundness and efficiency of the relevant infrastructures and the existence of a level playing field. Particular attention is given to the systemic consequences of increasing integration, in particular with regard to concentration and interdependencies.

As a catalyst, the Eurosystem seeks to facilitate the efficiency of the overall market arrangements for payments, clearing and settlement. It facilitates integration of the retail payments market and of the securities infrastructures, inter alia, by promoting harmonisation and technical standardisation and by sharing the Eurosystem's expertise. It cooperates closely with the payments and securities industry and with the European Commission.

Further information on the Eurosystem's work on financial integration is available in the ECB's reports on "Financial Integration in Europe", published annually.

4.1.2 Trading and post-trade processing

The MiFID distinguishes between three kinds of trading venue: (i) traditional exchanges (called "regulated markets" in the MiFID); (ii) MTFs, a new category of trading platform created by the MiFID in order to compete with exchanges; and (iii) "systematic internalisers" – ie firms which, on an organised, frequent and systematic basis, deal on their own account by executing client orders outside regulated markets and MTFs. In some cases, traditional exchanges hold licences as regulated markets in certain market segments (eg equities and derivatives) and in parallel own and/or operate MTFs. At the end of 2009 there were

62 regulated markets in the euro area (a single stock exchange may maintain several regulated markets) and 51 MTFs.³²

4.1.3 The clearing landscape

Globally, as well as in the euro area, CCPs initially provided services relating to derivatives traded on exchanges. Recently they have begun to be used more often for equities and bond transactions, as well as for some OTC derivatives transactions. In 2009 the euro area securities and derivatives markets were served by nine officially registered CCPs located in the euro area (according to the official register maintained by ESMA, ie the CESR MiFID database). In addition, some other entities not registered as independent CCPs provided central clearing services, sometimes as part of an exchange. While there were 13 entities providing CCP services when the euro was introduced in 1999, as a result of consolidation the number then fell to seven, before increasing again from 2007 following the establishment of new CCPs, partly as a consequence of the emergence of new MTFs competing with exchanges, as made possible by the MiFID; see Table 4.

Table 4
Euro area central counterparties, end-December 2009

Member state of incorporation	Name	Ownership	Asset focus	Market coverage
Austria	CCP.A	Exchange-owned ¹	Securities and derivatives	Domestic
Germany	ECC (European Commodity Clearing)	Exchange-owned ²	Commodity/energy derivatives (incl OTC derivatives)	Cross-border
Germany	Eurex Clearing	Exchange-owned	Securities and derivatives (incl OTC derivatives)	Cross-border
Spain	MEFFClear ³	Exchange-owned	Securities (bonds)	Domestic
France	LCH.Clearnet SA	User-owned	Securities and derivatives (incl OTC derivatives)	Cross-border
Greece	ADECH (Helex)	Exchange-owned	Derivatives	Domestic
Italy	CC&G (Cassa di Compensazione e Garanzia)	Exchange-owned	Securities and derivatives	Domestic
Netherlands	EMCF	Owned by a bank and NASDAQ	Securities (equities)	Cross-border
Portugal	Omiclear	Exchange-owned	Commodity/energy derivatives	Cross-border

This list of CCPs is based on the CESR MiFID database and does not include clearing houses that are not registered independently of the exchange that operates them.

¹ Jointly owned by the Vienna Stock Exchange and the Austrian CSD, OeKB (Oesterreichische Kontrollbank).

² Owned by more than one exchange. ³ Derivatives are cleared by MEFF (a CCP within the derivatives exchange).

Sources: CESR MiFID database; CCP websites.

³² Information on European trading venues can be found in the ESMA MiFID database at www.esma.europa.eu.

The MiFID and the Code of Conduct on Clearing and Settlement (an industry self-regulation initiative), by opening up various markets and trading and post-trading activities to greater competition, have launched a market development process that could fundamentally change the landscape for CCP services in the euro area (a process on which the EMIR will also have an impact – see Section 1.2 above).

In addition to infrastructures located in the euro area, euro-denominated financial instruments are cleared by, or institutions located in the euro area participate in, CCPs located outside the euro area. Important examples are LCH.Clearnet Ltd (UK), ICE Clear Europe (UK) and SIX x-clear (Switzerland).

4.1.4 Securities settlement

In mid-2011 there were 25 CSDs operating SSSs in the euro area, four more than 10 years earlier. However, it should be noted that the period in question has seen both consolidation and, following enlargement, the entry into the euro area of new EU member states and their respective CSDs. For example, in 2008 alone Cyprus and Malta and their local CSDs joined the euro area, VP LUX (an affiliate of the Danish CSD) was established in Luxembourg and the Irish NTMA ceased operating.

Of these 25 SSSs (including the three regional CSDs in Spain), 23 are eligible for the delivery of securities to the Eurosystem as collateral in central bank credit operations.

All euro area CSDs offer settlement in central bank money, whereas the ICSDs offer settlement in commercial bank money. Given the large-value securities transactions settled, the related cash flows are, of course, also of a considerable size. In fact, many of the payment systems embedded in SSSs are comparable in size to payment systems processing large-value payments in euros.

Euro area CSDs have established a network of 54 eligible bilateral links and seven eligible relayed links for the purposes of transferring securities between them (including the delivery of eligible collateral in Eurosystem monetary policy and intraday credit operations). The total number of links may in fact be even higher, as CSDs may have established additional links for other instruments that are used for market purposes, but not for delivering collateral to the Eurosystem. However, although there are a large number of direct and relayed links, relatively few are used extensively.

For more information on CSDs and links, see Section 4.5.2.

4.2 The REGIS-TR trade repository

4.2.1 Institutional framework

The trade repository REGIS-TR was launched in December 2010 as a joint initiative of Clearstream Banking S.A. and Bolsas y Mercados Españoles/Iberclear to comply with EU regulations requiring OTC derivative transactions to be reported to trade repositories from end-2012. The company, headquartered in Luxembourg, is co-owned by the two founding partners, who hold equal stakes of 50%.

The trade repository complies with all the new proposals for regulatory requirements that have been made public in the context of the European Commission's proposed European Market Infrastructure Regulation and that aim at increasing safety and transparency in the OTC derivatives market.

4.2.2 REGIS-TR participation and types of transaction

REGIS-TR is a European central registry and trade repository which enables market participants to register derivatives contracts in a variety of financial instruments traded OTC.

Initially the service was only offered for interest rate OTC derivatives, but REGIS-TR plans to broaden the range of contracts and underlying assets it covers in the coming years (eg forex derivatives coverage is planned from mid-2011). REGIS-TR aims at covering both standardised and customised contracts.

Any type of institution, whether financial or non-financial, can use REGIS-TR. The registry is flexible and allows both eligible participants and participants' clients to have access. There are two types of participation in REGIS-TR: direct³³ and indirect participation.³⁴

REGIS-TR is designed to support its customers in capturing transaction information and fulfilling reporting obligations vis-à-vis relevant regulatory and supervisory authorities.

It gives market participants, regulators and supervisors access to a consolidated global view of these OTC derivative positions, thus facilitating compliance with future transparency requirements arising from the EMIR.

Additionally, REGIS-TR provides its customers with tools which facilitate administrative tasks for the users of the registry, such as data management, certification, confirmation, matching and position reconciliation.

4.2.3 Operation of the system

The REGIS-TR system has been developed and is maintained by Bolsas y Mercados Españoles (BME). It is open for registration, matching and confirmation processes from 8.30 am CET to 6.30 pm CET every business day in accordance with the TARGET2 calendar.

Users can access REGIS-TR via a secure web access to input data manually and raise queries at any time, on any day. REGIS-TR also supports XML and SWIFT technology for file transfers and reporting purposes.

4.3 Central counterparties and clearing systems

4.3.1 LCH.Clearnet SA

4.3.1.1 Institutional framework

The French CCP LCH.Clearnet SA is registered and operates under French law, which stipulates that clearing houses must either be authorised credit institutions or be operated by a credit institution (Article L. 440–1 of the French Monetary and Financial Code).

LCH.Clearnet SA is thus by law a credit institution within the meaning of the Banking Directive and operates as a clearing house and settlement system for financial instruments.

As a credit institution, LCH.Clearnet SA is licensed and supervised by the Autorité de contrôle prudentiel (Article L. 613–1 et seq of the French Monetary and Financial Code).

As a clearing house and SSS, LCH.Clearnet SA is regulated by the Autorité des marchés financiers (Article L. 621 et seq of the French Monetary and Financial Code).

As a financial instruments clearing and settlement system, LCH.Clearnet SA is overseen by the Bank of France. Pursuant to the Act of 11 December 2001, codified as Article L. 141–4 II of the

³³ Direct participants can register contracts and transactions on their own behalf and on behalf of their clients and are able to match trades with other direct participants.

³⁴ Indirect participants are clients of direct participants.

Monetary and Financial Code (the Statute of the Bank of France), the Bank of France is in charge of the oversight of clearing and settlement systems for financial instruments.

LCH.Clearnet SA also owns branches in Amsterdam and Brussels, as well as a representative office in Portugal, related to the clearing of the Euronext markets. Since LCH.Clearnet SA is the CCP for transactions executed on Euronext Amsterdam, Euronext Brussels and Euronext Lisbon, it is also subject to supervision by the Dutch, Belgian and Portuguese regulatory authorities. An MoU has been signed between those authorities for the coordinated regulation, supervision and oversight of the clearing activities of LCH.Clearnet SA related to the Euronext markets. A joint committee has been set up for this purpose (the Co-ordination Committee on Clearing). Cooperation among these authorities is coordinated by a Permanent Secretariat, currently provided by the Bank of France.

In the context of its business development and, more specifically, in order to provide clearing services to UK-based trading platforms, LCH.Clearnet SA requested and obtained in 2010 Recognised Overseas Clearing House (ROCH) status from the UK Financial Services Authority.

LCH.Clearnet SA, as well as its sister company, the London-based clearing house LCH.Clearnet Ltd, is a wholly owned subsidiary of LCH.Clearnet Group Limited incorporated in the United Kingdom, which is a financial holding company as defined in the Banking Directive. According to the Banking Directive, the supervision of LCH.Clearnet SA as a credit institution has to be based on the consolidated financial situation of the holding company and this supervision on a consolidated basis is exercised by the Autorité de contrôle prudentiel. An MoU has been signed between the authorities in charge of the supervision of LCH.Clearnet SA and those in charge of the supervision of LCH.Clearnet Ltd (the UK Financial Services Authority and the Bank of England), for the exchange of information at the group level. A joint initiative has been set up for this purpose (the Joint Regulatory Authorities). The cooperation among these authorities is coordinated by a Permanent Secretariat, currently held by the Bank of France.

In November 2009 LCH.Clearnet Group completed a voluntary share redemption. As a result of the redemption, 83% of LCH.Clearnet is owned by the users of its services and 17% is owned by the exchanges.

4.3.1.2 Participation

In France, pursuant to Article L. 440–2 of the French Financial and Monetary Code, credit institutions and investment firms, and legal entities whose sole or main purpose is to provide financial instrument clearing services, can, under the conditions set out in the General Regulation of the Autorité des marchés financiers, be admitted as members of a clearing house. Additional criteria, such as minimum capital requirements, contributions to a clearing fund, disclosure of financial information and rating, need to be fulfilled in order for a market participant to become a clearing member of LCH.Clearnet SA.

A clearing member can be either a general clearing member (which clears operations for its own account and on behalf of brokers) or an individual clearing member (which only clears its own trades). The capital requirements for general and individual clearing members differ.

Compliance with financial and operational access criteria is reviewed before applicants are granted participant status. Moreover, participants' continued compliance with the access criteria is monitored on a regular basis.

4.3.1.3 Types of transaction

LCH.Clearnet SA acts as a CCP for a wide range of financial instruments: exchange-traded cash equities, exchange-traded equity and index options, exchange-traded commodity futures and options, and OTC sovereign debt securities (cash and repo transactions).

Since March 2010 LCH.Clearnet SA has also provided a clearing service for OTC European credit default swap index (iTraxx) contracts.

4.3.1.4 Operation of the system

LCH.Clearnet SA acts as a CCP for the instruments that it covers in its operations. Once a trade is submitted to the clearing house, it is registered and LCH.Clearnet SA becomes the counterparty of both the seller and the buyer. The guarantee provided by LCH.Clearnet SA includes the cash value of clearing members' positions, but also a procedure to deliver, where necessary, securities to the purchaser on behalf of a defaulting seller. While acting as a CCP, LCH.Clearnet SA contributes to the reduction of credit and liquidity risks associated with the trading and delivery of Euronext instruments.

In December 2010 LCH.Clearnet SA improved its processing capacity by bringing the Universal Clearing System into operation. This is a new equity clearing platform which is able to process up to 6 million transactions per day (twice the capacity of the previous platform).

4.3.1.5 Risk management

In order to perform its guarantee function, LCH.Clearnet SA implements a wide range of risk control measures, such as strict access criteria, marked-to-market valuation of its clearing members' exposures, margin calls and default funds.

There are two types of daily margin requirements:

- initial margins cover the upcoming risk on the open positions registered with the clearing house,
- variation margins cover the price difference between the original price of the registered position and the marked-to-market price.

In addition, in the derivatives and the fixed income (sovereign debt securities) segments, intraday margins are called when an intraday price variation limit is breached.

Additional margins can also be called for positions when risk exposures appear to be insufficiently covered by existing deposits in the default funds, which are recalculated each month.

Regarding the management of payment and settlement risk, the vast majority of payments involving the CCP are made in central bank money via TARGET2. Securities are settled on a DVP basis, and the vast majority of settlements are executed in the Euroclear Settlement of Euronext-zone Securities system (see Section 4.4.1) and in Monte Titoli (for the settlement of Italian sovereign debt securities).

As a credit institution, LCH.Clearnet SA has regular access to central bank facilities. In the management of the Lehman Brothers default, the fragmentation and heterogeneity of the SSSs in the EU further complicated matters for LCH.Clearnet SA because of the importance of its activity for various European markets, not just the Euronext markets. In particular, the liquidation of the defaulting participant's positions resulted in increased liquidity needs. In those circumstances, access to liquidity facilities with the Bank of France was used.

4.3.1.6 Links to other systems

A link between LCH.Clearnet SA and the Italian CCP, Cassa di Compensazione e Garanzia, was activated in August 2004 for the clearing of Italian sovereign debt securities.

French and Italian regulatory authorities signed an MoU in February 2003 concerning the activities covered by the agreement between MTS S.p.A., Cassa di Compensazione e Garanzia S.p.A. and LCH.Clearnet SA.

The credit risk management systems set up within the framework of this clearing link proved to be efficient during the management of the Lehman Brothers default. Nevertheless, some

improvements have been implemented taking into account the lessons learnt from this episode. LCH.Clearnet SA worked in close partnership with the Italian infrastructures in order to facilitate the management of its settlement activities in the Italian market.

4.3.1.7 Pricing

For the cash equities markets, a fixed fee structure is in place with a €0.05 clearing fee for blue chip stocks postings and a €0.10 clearing fee for other stocks. Periodic fees consist of membership fees for cash markets participants.

For the fixed income market, a fixed fee of €0.40 per million nominal is charged.

For the credit default swap clearing service, the clearing fee is a percentage of the value of the cleared contract. This percentage is degressive and is based on the value of the contract. The fee is capped at €100 for an individual transaction.

Technical fees are in place, linked to the provision of IT devices for secured access.

4.3.1.8 Major current and future projects

Current projects include the improvement of the solution for the clearing of Spanish government bonds and repos, launched in December 2010 with settlement in the Spanish CSD, Iberclear. LCH.Clearnet SA is also planning to offer a clearing solution linked to BondMatch, the MTF for a secondary market for corporate bonds launched by NYSE Euronext. The service will cover euro-denominated international corporate, financial and covered bonds traded on this MTF.

Several projects are foreseen in the medium term, including functional, legal and governance changes in relation to the credit default swap service, in order to build an attractive solution for the main participants in the credit default swap market.

New developments are also expected concerning the platform of the Universal Clearing System, which should clear equity derivatives by the end of 2011. LCH.Clearnet SA also plans to upgrade its operational capacity through the launch of a new clearing platform for bonds and repos.

4.3.2 Eurex Clearing

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

As a credit institution, Eurex Clearing AG is licensed by the Federal Financial Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht – BaFin) and supervised by BaFin and the Deutsche Bundesbank. Supervision is carried out according to the general principles of allocation of supervisory tasks between BaFin and the Deutsche Bundesbank laid down in the Banking Act and in agreements between those authorities. As a financial instruments clearing and settlement system, Eurex Clearing AG is overseen by the Deutsche Bundesbank based on Article 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 Deutsche Bundesbank and BaFin use the overall risk management provision of the Banking Act to require Eurex Clearing AG to meet the CPSS/IOSCO and ESCB-CESR Recommendations.

Eurex Clearing AG clears for several trading facilities under the umbrella of the Deutsche Börse Group, but also for off-exchange trades (OTC trades). Products cleared comprise a wide range of cash, repo and derivatives products. The Eurex Group is owned by the German and Swiss exchange holding companies following the merger of Deutsche Terminbörse and SOFFEX in 1998. In legal terms, the derivatives markets in Zurich and Frankfurt am Main are separate and subject to market supervision by the respective national

market supervision authorities. As Eurex Clearing AG clears for both markets, an MoU has been signed by BaFin, the Deutsche Bundesbank, the Swiss National Bank and the Swiss Financial Market Supervisory Authority FINMA. Eurex Clearing AG also provides clearing for the Dublin stock market. It has obtained ROCH status from the UK Financial Services Authority. It is also subject to supervision by the US Commodity Futures Trading Commission as a Multilateral Clearing Organization as well as by the US Securities and Exchange Commission.

For further details, see the descriptive Red Book country chapter on Germany.

4.3.3 European Multilateral Clearing Facility

The European Multilateral Clearing Facility NV (EMCF) was incorporated in the Netherlands in March 2007 under Dutch law. EMCF is a CCP for transactions in cash equities. It delivers CCP services for 19 European equities markets through the trading platforms of Chi-X, NASDAQ OMX Nordics, BATS Europe, Quote, Burgundy, First North and The Order Machine (TOM).

The shares of EMCF are held by ABN AMRO Bank NV (78%, of which 1% is held directly and 77% is held through its subsidiary ABN AMRO Clearing Bank) and by NASDAQ OMX AB (22%).

EMCF is overseen by the Netherlands Bank and supervised by the Netherlands Authority for the Financial Markets. It has ROCH status in the UK (where it is supervised by the Financial Services Authority).

Since its establishment EMCF has expanded rapidly. At the end of 2010 EMCF, as a CCP, was guaranteeing an average of 3.5 million transactions a day, which means that EMCF is responsible for approximately 35% of the transactions in European blue-chip shares.

EMCF uses the private settlement bank model. It uses several (international) settlement and paying agents and has several (indirect) relationships with (international) CSDs.

EMCF is designated as a “system” within the meaning of Section 212a of the Dutch Bankruptcy Act by the Dutch Ministry of Finance. It is therefore a system protected by the provisions of the Settlement Finality Directive.

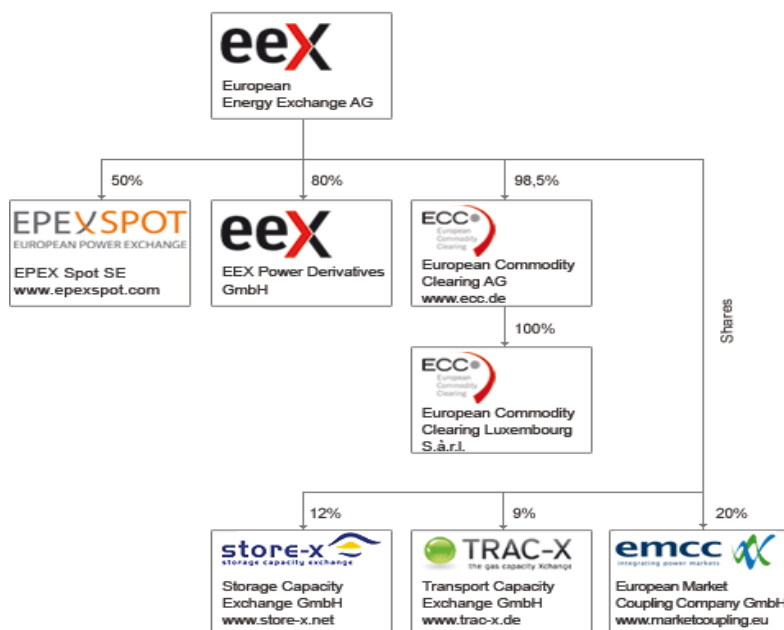
For further details, see the descriptive Red Book country chapter on the Netherlands.

4.3.4 European Commodity Clearing AG

European Commodity Clearing AG (ECC) is a clearing house providing clearing and settlement services for exchange and OTC transactions in energy and commodity products. ECC is registered and operates under German law, which defines CCP clearing as banking business. Thus, ECC has a banking licence according to Article 1 Section 1 (12) and Section 31 of the German Banking Act. As a credit institution, ECC is licensed by BaFin and is jointly supervised by BaFin and the Deutsche Bundesbank. Supervision is carried out according to the general principles of the allocation of supervisory tasks between BaFin and the Deutsche Bundesbank laid down in the German Banking Act and in agreements between the two authorities.

ECC is a subsidiary of the European Energy Exchange AG (EEX). EEX was founded in 2002 as a result of the merger of the two German power exchanges, in Leipzig and Frankfurt am Main. EEX provided clearing services until the establishment of ECC in 2006. The current structure of EEX is shown in the chart below.

Chart 5

ECC as part of the European Energy Exchange AG

Source: EEX website www.eex.com.

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

In cooperation with ECC, the primary CCP of EEX, Eurex Clearing AG, provides clearing services for transactions in certain markets and in certain products (cooperation products) as a sub-CCP on the basis of the CCP-Sub-CCP Agreement. Physical settlement of all transactions for which ECC undertakes clearing is provided through European Commodity Clearing Luxembourg S.a.r.l. (ECC Lux), a subsidiary of ECC.

For further details, see the descriptive Red Book country chapter on Germany.

4.4 Securities settlement

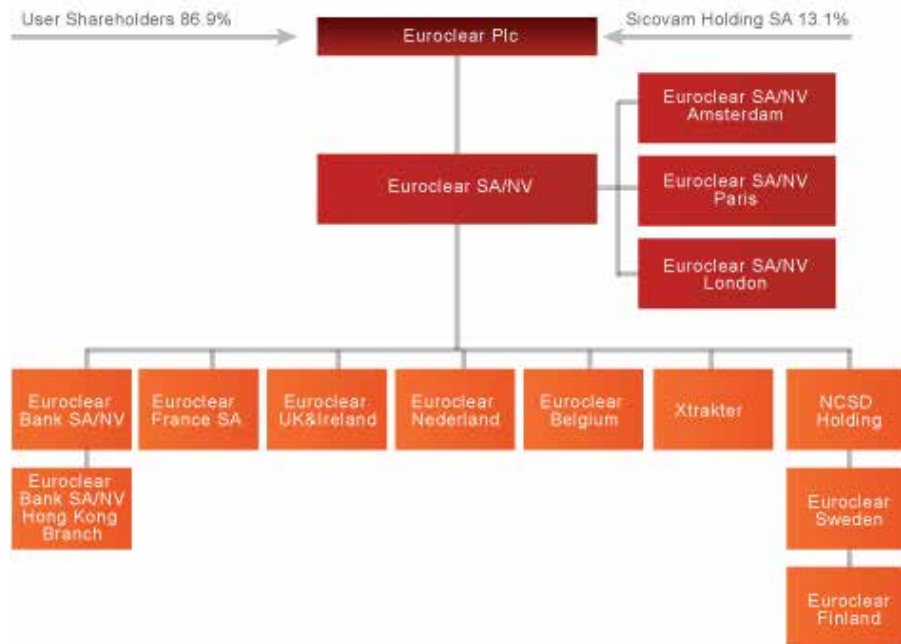
4.4.1 Euroclear Group

4.4.1.1 Institutional framework

Euroclear SA/NV is the parent company of the ICSD Euroclear Bank and the CSDs Euroclear UK and Ireland, Euroclear France, Euroclear Nederland and Euroclear Belgium. Moreover, at the end of 2008 Euroclear SA/NV acquired the Nordic Central Securities Depository (NCSD), encompassing the CSDs of Finland and Sweden. Euroclear also owns Xtrakter, which operates the TRAX trade matching system.

Euroclear SA/NV is incorporated in Belgium, with branch offices in Amsterdam, London and Paris, Euroclear Plc being the ultimate holding company of the group. The current structure of the Euroclear group is presented in the chart below.

Chart 6
Company structure of the Euroclear group



As at mid-2011 NCSD Holding directly owned Euroclear Finland. Moreover, NCSD Holding was in the process of being wound up, with both Euroclear Sweden and Euroclear Finland becoming direct subsidiaries of the Euroclear Group.

Source: Euroclear group website www.euroclear.com.

The features that are common to all the Euroclear group (I)CSDs are presented below. The operation of the system, participation, links to other systems and pricing are, in general, system-specific for each Euroclear group (I)CSD. The characteristics of each Euroclear group (I)CSD are covered in the relevant descriptive Red Book chapters: Euroclear Bank in the international chapter, Euroclear Belgium, Euroclear France and Euroclear Nederland – whose systems are consolidated in the Euroclear Settlement of Euronext-zone Securities (ESES) system – in Section 4.4.2 and, finally, Euroclear UK & Ireland and NCSD Holding in the descriptive Red Book country chapters covering the United Kingdom and Sweden respectively.

4.4.1.2 Oversight and prudential supervision

The group's (I)CSDs are separate legal entities and are in separate regulatory environments, as described in the relevant descriptive Red Book country chapters.

A cooperative oversight framework, based on an MoU, exists between the Euroclear group regulators, ie the overseers and securities regulators of Belgium, France, the Netherlands, the United Kingdom and Ireland, Sweden and Finland. This framework is based on the lead oversight and lead supervision principle and aims at allowing each authority to fulfil its responsibilities, while promoting the efficiency of the controls through a homogeneous approach that avoids redundancies.

4.4.1.3 Governance

Euroclear plc – and hence the Euroclear group – is user-owned and user-governed. The capital of Euroclear plc is for the most part held by user-shareholders. The remainder of the share capital is held by Sicovam Holding SA, a holding company that brings together the

former shareholders and/or users of Euroclear France, which is the largest shareholder of Euroclear plc.

Both Euroclear plc and Euroclear SA/NV have independent boards of directors that make the strategic decisions for the group.

In the general meeting, shareholders take decisions by majority voting. Voting rights are allocated to each shareholder in proportion to their holding of voting shares. However, a single shareholder's voting right is limited to 5% of the share capital.

4.4.1.4 Risk management

Euroclear SA/NV owns and operates most of the IT infrastructure of the Euroclear group. It also offers a broad range of services to the (I)CSDs of the group, such as audit, financial, risk management, legal, human resources and product management services.

An enterprise risk management (ERM) framework has been established across the Euroclear group. Responsibility for the maintenance and development of the ERM framework rests with the Operational Risk Management team. The ERM framework helps ensure that decisions by members of the group are in line with the Euroclear group's risk appetite.

An Operational Risk Policy is in place, which defines a number of processes to ensure a sound operational control environment. The objectives of this policy are to: (i) effectively identify, measure, manage and control operational risk factors; (ii) develop operational risk mitigation strategies; (iii) reduce the likelihood and impact of loss events; and (iv) define the roles and responsibilities for operational risk management. An important cornerstone of the Operational Risk Policy is the group's IT resilience strategy. It is based on an infrastructure comprising three data centres that is designed to cope with local or regional disasters. Two data centres are load-balanced and updated synchronously. Tasks can be quickly switched from one to the other. They alternate on a monthly basis as the active primary data centre. A third remote data centre – the hot standby site – is able to take over the processing of the full production volume in the event of a regional disaster affecting both of the other data centres. It replicates data asynchronously, but aims to ensure complete settlement within the business day. Full data mirroring between the three data centres ensures that identical data exist at the backup data centre. The Euroclear group also operates a dual-office strategy whereby critical teams are located across two distant sites, aiming to ensure client services and operations following a major metropolitan-wide event.

All entities of the Euroclear group regularly perform detailed impact analyses to identify and monitor their critical activities and recovery time objectives. Business continuity plans have been harmonised at the corporate and departmental levels throughout the group. Finally, each element of the business continuity strategy is regularly maintained and tested.

4.4.1.5 Major current and future projects

The Euroclear group will further develop its (I)CSDs' platforms according to the needs of the markets concerned. There is a group-wide focus on collateral management services. For example, a "Term DBV"³⁵ service was introduced in the United Kingdom in June 2011; solutions for collateral management (both for interbank operations and for refinancing operations with the central bank) will be delivered to the French, Dutch and Belgian markets. Further details can be found in the respective descriptive Red Book country chapters.

³⁵ Euroclear UK & Ireland modified its delivery by value (DBV) service – providing a method of settling term repo instructions as a series of overnight instructions – by incorporating a term DBV functionality including some automated ability to substitute collateral.

4.4.2 ESES securities settlement systems

The Euroclear Settlement of Euronext-zone Securities (ESES) system was launched on 19 January 2009. Since then Euroclear has provided for the French, Dutch and Belgian Euronext-zone market CSDs an operationally integrated settlement solution, for both stock exchange and OTC trades. The ESES platform integrates the settlement activity of the SSSs of Euroclear Belgium, Euroclear France and Euroclear Nederland, which are all part of the Euroclear group. However, Euroclear Belgium, Euroclear France and Euroclear Nederland remain three legally separate SSSs.

4.4.2.1 Institutional framework

Each of the three ESES SSSs is operated by its domestic CSD: Euroclear Belgium, Euroclear France and Euroclear Nederland. All three operators are subsidiaries of Euroclear SA/NV, the Euroclear group holding company, and outsource the IT platform operations to Euroclear SA/NV (see Section 4.4.1.1). Euroclear SA/NV also delivers common services, such as risk management, internal audit, legal and human resources services, to its subsidiaries, including the ESES CSDs. The three CSDs and SSSs share a common IT platform, rely on harmonised settlement and custody services, and apply a harmonised pricing framework.

The delivery of this integrated ESES solution has required strong coordination mechanisms between the CSDs. For this purpose, the ESES CSDs have streamlined governance since March 2009. Basically, the board and management structure in each CSD is retained, but their membership composition has been aligned. The composition of each CSD's board of directors is the same, with the same person being chairman of all three CSDs. Moreover, the composition and the chairman of the audit committee is the same for all three CSDs. Furthermore, the three CSDs have the same chief executive officer and the composition of their management committees is identical.

Integration has been further enhanced by a new operating model introduced in March 2011, which applies a matrix organisation across the ESES CSDs. As a result, each area of activity across all three CSDs is headed by a single manager, while the management remains ultimately accountable for the performance of each individual CSD.

4.4.2.2 Participation

Participation in the CSDs is governed by a set of terms and conditions. Book I contains the terms and conditions for ESES and Book II contains the terms and conditions for each national component of ESES.

In order to be admitted as a client in accordance with the terms and conditions of ESES, an applicant must belong to one of the following categories:

- i. credit institutions;
- ii. investment firms;
- iii. CSDs;
- iv. national central banks;
- v. public institutions;
- vi. any other category listed in the terms and conditions of the system (Book II). These categories differ across the three CSDs and accommodate national differences.

According to the Terms and Conditions of ESES, the access criteria that apply to any participant in the SSS, excluding issuers, include:

- i. technical and operational capability;
- ii. reputation in the market;

- iii. anti-money laundering programme;
- iv. risk assessment.

ESES memberships overlap, with many participants being a member of more than one ESES CSD and/or SSS.

4.4.2.3 *Types of transaction*

ESES provides settlement services for a wide range of securities in the Belgian, Dutch and French markets. It handles all transactions executed on the Paris, Amsterdam and Brussels Euronext stock exchange cash markets. These on-exchange trades are centrally cleared by the Paris-based LCH.Clearnet SA (see Section 4.3.1) before they are settled on the ESES platform. In addition, ESES settles bilaterally concluded OTC trades. The platform offers a large variety of services for the securities held on the accounts, including repo settlement. Links are maintained with several SSSs (see Section 4.4.2.6).

4.4.2.4 *Operation of the system*

ESES offers DVP book-entry settlement in central bank money (DVP model 1), providing immediate settlement finality and high settlement efficiency. Transactions are settled in central bank money on cash accounts legally held with the National Bank of Belgium, the Bank of France and the Netherlands Bank. The accounts are operated by Euroclear Belgium, Euroclear France and Euroclear Nederland. Moreover, ESES enables a participant to use just one central bank account to settle its transactions in all three CSDs/SSSs. ESES' connection to TARGET2 offers maximum flexibility for monetary policy operations and for access to central bank liquidity (for further details, see below).

The ESES system relies on IT services provided by Euroclear SA/NV. This outsourcing arrangement, approved by the competent authorities, is governed by the Shared Service Agreement between Euroclear SA/NV and the ESES CSDs.

Within the framework of the matrix organisation applied across the ESES CSDs/SSSs, the settlement activities of Euroclear Belgium and Euroclear Nederland have been outsourced to Euroclear France (from March 2011).

4.4.2.5 *Risk management*

Risk management in ESES entails several aspects. First, ESES participants have to follow strict participation criteria and access procedures which include a risk assessment. Second, ESES ensures real-time gross settlement (DVP model) in central bank money, minimising settlement risk. Third, ESES allows the use of intraday credit with the central banks. This is easily transferred to and from the ESES platform to ensure a smooth settlement process. In France, the auto-collateralisation facility provided by Euroclear France to French settlement banks helps to ensure timely settlement because, should the participant with the largest obligation be unable to settle, timely settlement would be completed by using a "pension livrée conservatoire" (PLC) or auto-collateralisation repo. The PLC procedure is designed to provide additional intraday liquidity against eligible collateral to participants for settlement purpose in ESES. For securities lending facilities, ESES does not manage a dedicated programme. ESES participants have to use the facilities available, eg in their local market.

As regards the ESES risk management practices, an enterprise risk management framework has been established across the Euroclear group (see Section 4.4.1.4).

4.4.2.6 *Links to other systems*

ESES CSDs have international links with CSDs in 16 countries, as well as with Euroclear Bank and Clearstream Banking Luxembourg. The Euroclear Nederland link, the Euroclear Belgium link and several of the Euroclear France links are relayed links through Euroclear Bank. Euroclear France also maintains eight direct links with several foreign CSDs.

4.4.2.7 Pricing

ESES tariffs are harmonised across the ESES CSDs. There are additional tariffs for services which are specific to each ESES CSD. Up-to-date tariff schedules are available on the respective websites.

4.4.3 Clearstream Group

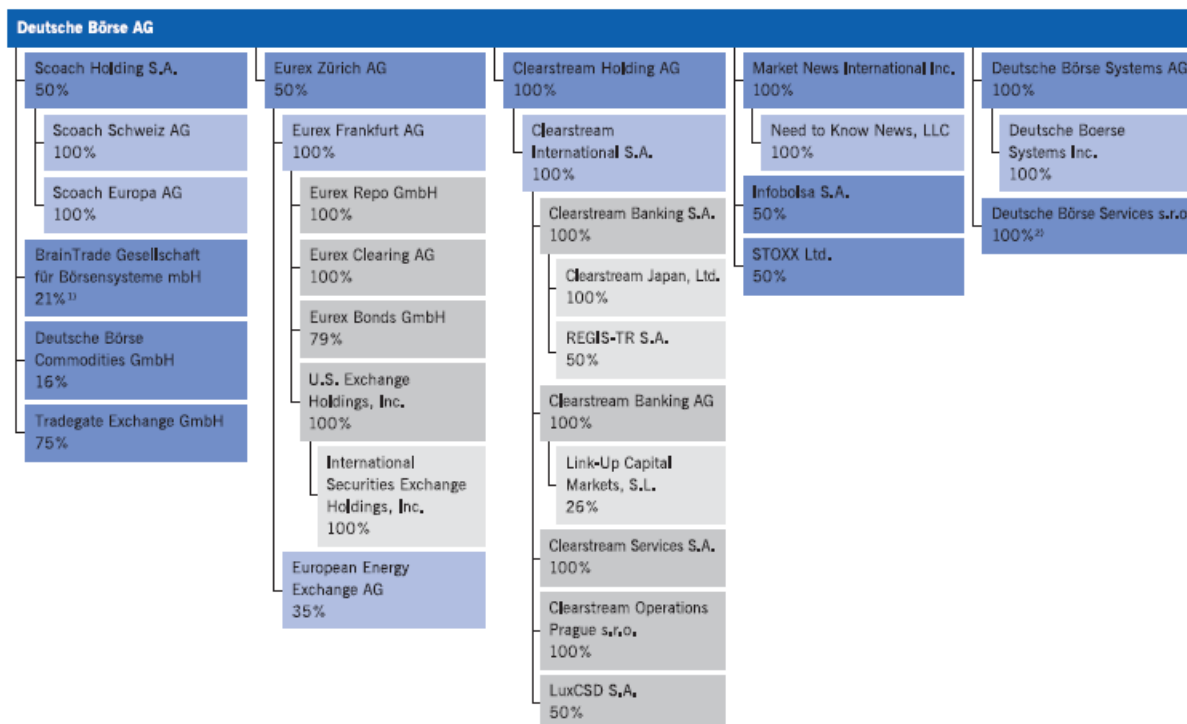
4.4.3.1 Institutional Framework

The corporate framework of the Clearstream Group has undergone a number of changes in the last few years. Currently Deutsche Börse AG, in Frankfurt am Main, is the parent company of the newly established Clearstream Holding AG, Frankfurt am Main, which owns Clearstream International S.A., Luxembourg. Clearstream International S.A. is the holding company for the ICSD Clearstream Banking S.A., Luxembourg (CBL), the German CSD Clearstream Banking AG, Frankfurt am Main (CBF), and for other related companies.

Clearstream International S.A. is an international clearing and settlement organisation providing extensive services for equities and bonds for both domestic and international business. It provides two basic services to the industry: (i) an ICSD through CBL and (ii) a CSD through CBF.

Chart 7
Structure of the Deutsche Börse Group

Simplified shareholding structure of Deutsche Börse Group as at 1 January 2011



Source: Deutsche Börse Group, 2010 Annual Report.

CBL, as an ICSD, offers clearing, settlement and asset servicing facilities for the Eurobond market and for securities in some 50 countries. It also provides dedicated securities lending, collateral and cash management services to its customers.

In addition, CBL operates LuxClear, a service which offers all the securities services required to link the Central Bank of Luxembourg to both Luxembourg-domiciled banks and foreign banks in accordance with the CCBM.

CBL has also jointly created with the Central Bank of Luxembourg a new CSD in Luxembourg, LuxCSD, which will provide settlement in central bank money and aims to be a local access to T2S when it is implemented in 2014. LuxCSD is co-owned with equal stakes of 50% held by the two founding partners.

More information on CBL is provided in the international chapter of the descriptive Red Book.

CBF, as a CSD, offers clearing and settlement facilities for the German securities markets. Information on CBF is provided in the country chapter of the descriptive Red Book covering Germany.

4.4.3.2 Oversight and prudential supervision

The group's ICSD and CSD remain separate legal entities in separate regulatory environments. The regulatory environments for the ICSD and the CSD are described in the international chapter of the descriptive Red Book and the chapter covering Germany.

4.4.3.3 Governance

Deutsche Börse AG is a German Aktiengesellschaft (company limited by shares) and is listed on the German stock exchange. At the end of 2010 95% of the shares were held by institutional investors and 5% by private investors. The investors are based in Germany (18%), the United Kingdom (16%), the United States (32%) and other countries (34%).

4.4.3.4 Risk management

Deutsche Börse AG and Clearstream Services SA own and operate the IT infrastructure of the Clearstream Group. They also offer a broad range of services such as audit, financial, risk management, legal, human resources and product management services.

The Clearstream Group's business continuity arrangements cover all sites, network control centres and business sites. The Deutsche Börse Group has a Group Risk Management team that defines its overall objectives and monitors its overall risk profile. It also has a comprehensive Business Continuity Management policy. The policy ensures that the risk framework is implemented group-wide so that all risks are identified, centrally recorded and systematically assessed. Contingency plans and backup facilities are regularly tested in cooperation with market participants and relevant parties, and are maintained to ensure their resilience.

4.4.3.5 Major current and future projects

The Clearstream Group will further develop its platforms according to the needs of the market concerned and the scope of the Eurosystem's T2S. In the context of T2S, value added services such as collateral management and securities lending services will become even more prominent than they currently are. In the field of OTC derivatives transactions, the Clearstream Group and the Spanish CSD Iberclear are currently developing trade data registry services using a separate legal entity (see Section 4.2).

4.4.4 The correspondent central banking model (CCBM)

Article 18.1 of the Statute of the ESCB requires all Eurosystem credit operations to be based on adequate collateral. Consequently, all Eurosystem liquidity-providing operations are based on underlying assets provided by the counterparties either in the form of the transfer of ownership of assets (in the case of outright transactions or repurchase agreements) or in the form of a pledge, an assignment or a charge granted over relevant assets (in the case of

collateralised loans). With the aim of protecting the Eurosystem from incurring losses in its monetary policy operations and of ensuring the equal treatment of counterparties, as well as of enhancing operational efficiency and transparency, underlying assets have to fulfil certain criteria in order to be eligible for Eurosystem monetary policy operations. In particular, underlying assets must be usable on a cross-border basis throughout the euro area. This means that Eurosystem counterparties may obtain credit from the NCB of the member state in which they are established (their home central bank (HCB)) by making use of eligible assets located in another euro area country.

When the euro was introduced, European securities market infrastructures were highly segmented and there were no adequate market arrangements available that could ensure the fulfilment of this criterion. Indeed, the network of links between SSSs was incomplete and thus unable to ensure the use of collateral assets throughout the euro area. The CCBM was introduced in January 1999 in order to ensure that all assets eligible for use in Eurosystem credit operations could be used as collateral by all Eurosystem counterparties, regardless of the location of those assets or counterparties. The model was designed to facilitate the cross-border use of collateral as an interim solution until adequate market solutions became available throughout the euro area. Although the network of CSD links has become more dense, there is still a gap; consequently, the CCBM is no longer considered to be an interim solution.

4.4.4.1 Institutional framework

Under Eurosystem rules, counterparties can obtain credit only from their HCB – ie there is no remote access to Eurosystem credit. Counterparties can use assets located in another country by transferring such assets to a correspondent central bank (CCB), typically the NCB of the country where the assets are issued. In order for the CCBM to function, market participants must make arrangements with the SSSs where the collateral is deposited for the delivery of the marketable assets. The CCB then holds the collateral on behalf of the HCB, acting as a custodian for the HCB. The credit can be released by the HCB once the CCB notifies it that adequate collateral has been received.

The use of the CCBM in Eurosystem credit operations is based on internal Eurosystem agreements. Under these agreements, each NCB agrees to act as the local agent for each other and the ECB, and responsibilities are allocated to the HCB and the CCB. The terms applicable to the collateral operations of counterparties are set out in the respective contractual or regulatory arrangements of the HCB. In particular, these documents specify whether the HCB will base its operations on assignments, repos, pledges or floating charges. The CCBM has been designed to ensure that, if possible under the relevant national legal systems, the HCB's choice of collateralisation technique should be respected for the mobilisation of both domestic and cross-border assets.

As, in many cases, custodian banks play an important role in the CCBM processing chain by delivering the marketable assets to the CCB on behalf of the counterparty, the major European credit sector associations (the EBF, the ESG and the EACB) have established best practices for custodian banks involved in CCBM transactions which entered into force in May 2005. These best practices help market participants to make the CCBM more efficient.

The CCBM has made a substantial contribution to the increased use of cross-border collateral, which – setting aside the effects of the global financial turmoil – reflects the growing integration of the euro area's banking and financial markets, with increased diversification in collateral portfolios and the emergence of banking groups operating in multiple countries. Since the CCBM was introduced, it has been the main channel for the cross-border use of collateral. In 2010 collateral submitted to the Eurosystem via the CCBM represented 24% of the total collateral provided. This figure is remarkable when compared with the 5% of collateral held in custody through link arrangements between SSSs, the alternative to the CCBM for transferring cross-border collateral.

4.4.4.2 *Participation*

All Eurosystem NCBs are party to the CCBM agreement. The CCBM initially also included the NCBs of non-euro area countries as CCBs (namely the National Bank of Denmark, Sveriges Riksbank and the Bank of England). However, in 2003 the settlement location criterion for eligible assets was reviewed, resulting in a requirement that the settlement of assets take place in an SSS located in the euro area. Consequently, non-Eurosystem NCBs no longer provide CCB services for assets issued and settled in their local CSDs. The only exception is the Bank of England, acting as a CCB for the Euro-market and international issues in the two ICSDs where the issuer is the government of the United Kingdom or a company incorporated in the United Kingdom.

4.4.4.3 *Types of transaction*

The CCBM is used exclusively for the transfer of collateral to and from the Eurosystem – ie it does not support collateral transactions between market participants of the Eurosystem.

The types of transaction concerned are the collateralisation of Eurosystem monetary policy operations as well as intraday credit operations in TARGET2.

4.4.4.4 *Operation of the mechanism*

All NCBs maintain securities accounts with each other for the purpose of the cross-border use of eligible assets. For marketable assets, the general rule is that the CCB is the NCB of the country of the issuing SSS (which is usually the domestic SSS of the country in which the assets are issued – ie registered and/or deposited). In general, each eligible asset has only one CCB. However, there are a few exceptions. First, for Euro-market and international assets issued simultaneously in Euroclear Bank and Clearstream Banking Luxembourg, the National Bank of Belgium acts as the CCB for holdings in Euroclear Bank and the Central Bank of Luxembourg acts as the CCB for those in Clearstream Banking Luxembourg. Second, for Irish government bonds deposited in Euroclear Bank, the Central Bank of Ireland acts as the CCB and, third, for Euro-market and international issues in Euroclear Bank and Clearstream Banking Luxembourg, where the issuer is the government of the United Kingdom or a company incorporated in the United Kingdom, the Bank of England acts as the CCB. For non-marketable assets, the general rule is that the CCB is the NCB of the country whose law governs the assets.

The specific procedure of the CCBM depends on the type of eligible asset involved as well as whether the eligible assets are earmarked for each individual transaction or whether they are held in a pool of underlying assets.

In an earmarking system, as soon as a counterparty's bid for credit is accepted by the NCB of the member state in which the counterparty is established (ie the HCB), the counterparty instructs (via its own custodian, if necessary) the SSS in the country in which its marketable assets are held to transfer them to the central bank of that country for the account of the HCB. Once the HCB has been informed by the CCB that the collateral has been received, it transfers the funds to the counterparty. Central banks do not advance funds until they are certain that the counterparty's marketable assets have been received by the CCB. Where necessary to meet settlement deadlines, counterparties may be able to pre-deposit assets with CCBs for the account of their HCB using the CCBM procedures.

In a pooling system, the counterparty is able at any time to provide the CCB with marketable assets for the account of the HCB. Once the HCB has been informed by the CCB that the marketable assets have been received, it will add these marketable assets to the pool account of the counterparty.

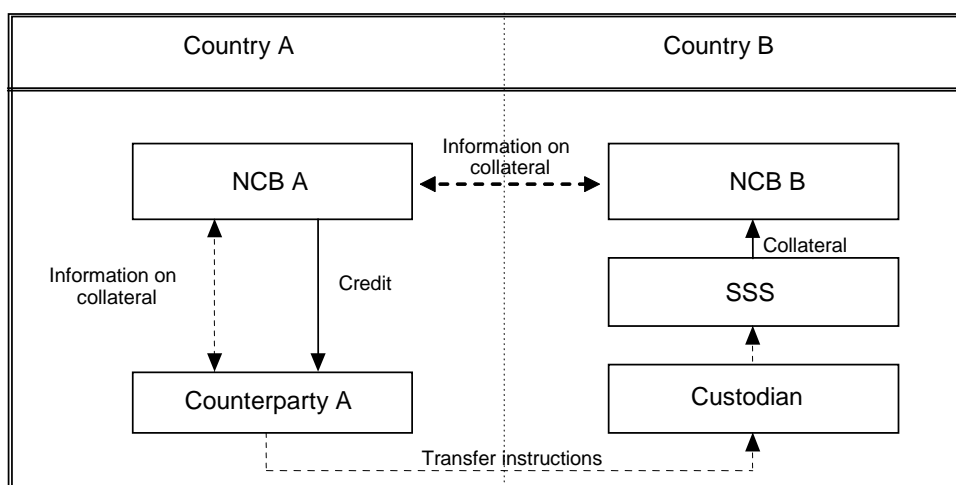
In the case of non-marketable assets, ie credit claims and non-marketable retail mortgage-backed debt instruments, which are not governed by domestic law, specific CCBM solutions have been implemented for their mobilisation. These specific assets can be used through the

CCBM using a transfer, assignment, pledge or floating charges on behalf of and in the name of the HCB. An ad hoc variant has been implemented to allow the cross-border use of Irish mortgage-backed promissory notes.

The CCBM is available to counterparties (for both marketable and non-marketable assets) from 9 am to 4 pm CET on each Eurosystem business day. A counterparty wishing to make use of the CCBM must advise the NCB from which it wishes to receive credit – ie its HCB – before 4 pm CET. Furthermore, the counterparty must ensure that the collateral for monetary policy operations is delivered to the account of the CCB by 4.45 pm CET at the latest. Instructions or deliveries not respecting this deadline will only be considered for credit on the following business day. When the counterparties foresee a need to use the CCBM late in the day, they should, where possible, deliver the assets in advance (ie pre-deposit them). In exceptional circumstances or when required for monetary policy purposes, the ECB may decide, subject to the availability of the CSDs and/or SSSs concerned, to extend the CCBM's closing time until the TARGET2 closing time.

Chart 8

The correspondent central banking model



To improve the level of service provided by the CCBM, the ECB's Governing Council decided that from January 2004 the HCB and the CCB should each aim to carry out their internal procedures within 30 minutes. This assumes, however, that counterparties (and their custodians) submit their instructions correctly and that some allowance is made for possible delays at peak times.

4.4.4.5 Pricing

Counterparties which make use of collateral on a cross-border basis must pay a transaction fee of €30 for each delivery of assets to their HCB through the CCBM. In addition, a combined custody and administration fee of 0.0069% per annum is charged on the nominal value of the assets – or the market value of assets without a nominal value. The fees have been set to cover the costs of the CCB and are charged by the HCB on a monthly basis. HCBs may also charge local fees.

4.4.4.6 Major future projects

The increased integration of the euro area's banking and financial markets and the importance of the cross-border use of collateral have increased the markets' demand for more efficient collateral mobilisation solutions. Despite the achievements of the CCBM, Eurosystem counterparties have identified a number of shortcomings, mainly linked to the fact that the service was initially designed as an interim solution. These shortcomings relate eg to the differences between domestic and cross-border procedures (owing to different procedures at the NCBs and CSDs) and lack of standardisation in the legal techniques and methods used for collateralisation, as well as in communication channels and messages.

In response to these market concerns, the Governing Council of the ECB decided in March 2007 to review the Eurosystem's collateral management procedures – particularly the CCBM. Two market consultations were launched, the first in April 2007 and the second in February 2008, which confirmed the business case for a harmonised collateral management system for the Eurosystem. Subsequently, in July 2008 the Governing Council of the ECB decided to launch the Collateral Central Bank Management project.

The main objectives of the project are to increase the efficiency of the Eurosystem's collateral management and address the drawbacks identified by market participants with regard to the current CCBM framework, to the extent that such issues fall within the remit of central banks. In this regard market participants requested in particular that the requirement to repatriate assets from investor CSDs to issuer CSDs before mobilisation as collateral through CCBM would be removed and that tri-party collateral management services could be used also on a cross-border basis.

The Collateral Central Bank Management will cater for transactions to mobilise both domestic and cross-border collateral. It will support all the currently existing collateralisation techniques and methods (pledges, repos, assignments, pooling and earmarking).

The Eurosystem Collateral Central Bank Management will be implemented in accordance with the principle of decentralised access to credit. This means that all Eurosystem central banks continue to grant credit to their local counterparties and remain responsible for all business relationships with them.

4.4.5 Major project: TARGET2-Securities

The integration of bond and equity markets relies on the integration of the underlying infrastructure, particularly that of SSSs and CCPs. However, in the euro area, progress on the integration of securities post-trading infrastructures has not kept pace with that of large-value payment infrastructures. This is largely because securities are inherently very complex, which has led to cross-country differences in terms of market practices and legal, regulatory and fiscal regimes.

The post-trading infrastructure for equities is even more fragmented than that for bonds. Cross-border settlement for bonds is largely concentrated in the two ICSDs, whereas the cross-border settlement of equities relies heavily on national CSDs. In both cases, a varying number of intermediaries (banks, local custodians, global custodians, etc) may be involved in the settlement process, adding further processing services and related costs. This high degree of fragmentation results in substantial post-trading costs for EU cross-border securities transactions, reduces the potential for economies of scale and is an obstacle to the emergence of a level playing field in Europe in this area. Although Europe is comparable to the United States in terms of its economic size, it lags behind it in terms of both the volume and cost of securities transactions. The price gap is particularly large for cross-border settlement.

An important element in the integration of securities infrastructures within the single market is the establishment of a common, neutral securities settlement service that will foster effective interoperability and competition between service providers. Consequently, with a view to

promoting financial integration and overcoming the fragmentation of the securities settlement infrastructure through the provision of central bank services, the Eurosystem has launched its T2S initiative in order to provide this missing element. T2S will be a future pan-European service to be used by CSDs for the settlement of securities transactions in central bank money. The project is currently in the development phase and live operations are scheduled to begin in June 2015.

According to a cost-benefit analysis prepared by the ECB together with market participants, T2S will bring some major benefits to European financial markets: It should bring down settlement fees by fully exploiting the economies of scale resulting from the use of a single IT settlement platform; it will remove the need to post collateral at multiple clearing houses, facilitating considerable collateral savings; it will be a catalyst for harmonisation across Europe, helping to remove the current barriers and inefficiencies that prevent straight-through processing; and it will have a positive impact on financial stability by settling exclusively in central bank money and offering high standards of resilience, availability, business continuity and security. Together with forthcoming European legislation, T2S will foster competition by facilitating user choice over which CSDs to use for settlement.

4.4.5.1 Institutional framework

The T2S initiative builds on the fact that the securities settlement services of CSDs and the cash settlement services of central banks are closely linked. A securities trade typically results in the delivery of securities (the securities leg) in exchange for the transfer of cash funds (the cash leg). In T2S the cash leg is settled in central bank money. To avoid credit risk in the T2S settlement process, the completion of one leg is carried out simultaneously with the completion of the other leg with immediate finality (DVP). While this method of settling securities trades is very effective within individual countries, it is so far hardly available at all at a cross-border level in Europe.

Holding securities accounts and central bank cash accounts on the same platform and thereby enabling integrated settlement is considered the most efficient way of settling the two legs of securities trades. With the launch of TARGET2, the Eurosystem now offers a single platform for the settlement of payments (the cash leg) in central bank money. However, securities are still held and settled on multiple platforms (ie individual CSDs). Outsourcing the central bank cash accounts to multiple CSDs would have reversed the gains from bringing central bank accounts together on TARGET2's single platform, while outsourcing to only a small number of CSDs would have given those CSDs a competitive advantage. Furthermore, the outsourcing of central bank cash accounts could pose a threat to the Eurosystem's ability to maintain full control over the provision of central bank money in all circumstances.

Consequently, with its T2S initiative, the Eurosystem has invited European CSDs to outsource their securities accounts to a single platform, which the Eurosystem will build and operate. The legal basis for the Eurosystem to build T2S is derived from Articles 17, 18 and 22 of the Statute of the ESCB.

The main aim of T2S is to bring all securities and cash accounts together on one technical platform with a view to settling nearly all securities transactions in Europe on that platform. T2S will not, however, constitute a CSD or an SSS in the legal sense, as for example defined in the Settlement Finality Directive. It is purely an IT platform to be used by CSDs to settle their securities transactions with immediate legal validity in T2S. CSDs will maintain their legal relationships with their customers and will continue to perform their custody and notary functions.

4.4.5.2 Participation

The CSDs will be the legal "counterparties" of the Eurosystem, ie the entities to which the Eurosystem's T2S services will be provided on the basis of standardised contractual arrangements. In early 2011 30 CSDs from 27 countries took part in negotiations with the

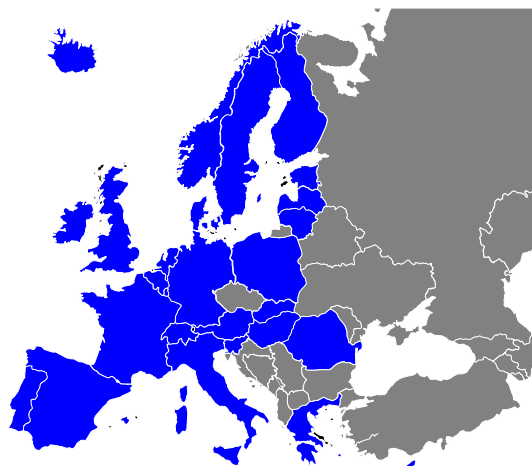
Eurosystem on participating in T2S. They included almost all CSDs in the EU, as well as three CSDs from outside the EU (from Iceland, Norway and Switzerland – see Figure 1).

Furthermore, one of the unique features of T2S is that it will be a multicurrency central bank money settlement platform. Non-euro area central banks that decide to provide their currency for settlement in T2S will thus also be legal counterparties of the Eurosystem, including on the basis of standardised arrangements. A number of central banks have expressed an interest in allowing securities transactions denominated in their national currency to be settled in central bank money in T2S, including the National Bank of Denmark, the Central Bank of Norway and Sveriges Riksbank.

Financial market participants, such as banks, brokers, investment banks and central clearing counterparties, will not be legal counterparties of T2S, but from a technical perspective they will be able to connect directly with T2S. This means they will be able to send their own settlement instructions directly to T2S, as well as receive queries and reports on their positions directly from T2S. For larger banks operating in multiple countries, this could bring significant benefits, enabling them to centralise and/or rationalise their back office processes.

Figure 1

Countries in which the CSD has signed the T2S MoU



4.4.5.3 Types of transaction

It will be possible to settle practically all bonds and equities transactions in T2S. The only restrictions are that the securities must have an ISIN code, be held in book-entry form and thus be fungible. The bulk of such transactions in T2S are expected to be DVP transactions, but FOP and payment-free-of-delivery transactions will of course also be possible. T2S will also be able to settle the outcome of corporate actions, eg cash or securities dividend payments, bonus issues, etc.

For the cash leg of a transaction, T2S will only settle in central bank money. T2S will facilitate access to central bank money for settlement purposes via T2S dedicated cash accounts. They are exclusively central bank money accounts opened on the books of an NCB, according to the access criteria defined by the NCB. Only T2S dedicated cash accounts can be used for the cash leg of securities settlement (in both the daytime and night-time settlement cycles). Liquidity can be transferred between RTGS accounts and T2S dedicated cash accounts via liquidity transfer orders.

Participants who are not eligible for central bank accounts or T2S dedicated cash accounts will be able to nominate a settlement bank which does have a T2S dedicated cash account to

settle the cash leg of transactions on clients' behalf. For this purpose, T2S will offer a "credit memorandum balance" functionality, which is a limit monitoring function in T2S that could be used by cash settlement banks to set limits at the client level and monitor their use.

4.4.5.4 Operation of the platform

T2S will operate in a real-time mode, processing transactions according to the order in which they are received and what priority they have been given. In the night-time settlement period, it is intended there will be several separate settlement cycles. However, T2S follows the CPSS Model 1 for DVP settlement (ie real-time gross settlement with immediate finality during both daytime and night-time settlement periods) and the booking of settlement instructions will occur only on a gross basis, although settlement optimisation procedures, such as technical netting, auto-collateralisation and partial settlement, may be used to reduce the resources needed for a set of transactions that are submitted together for settlement.

For settlement of DVP transactions in euros, the opening days of T2S will be those set out in the TARGET2 calendar; and for settlement of DVP transactions against payment in non-euro currencies, the opening days are in accordance with the opening days of the RTGS system of the respective non-euro central bank. For FOP transactions, T2S will be open for settlement from Monday to Friday every week of the year. Settlement of FOP transactions will therefore also be possible on days when the central bank's RTGS payment system is closed.

In terms of operating hours, the schedule of the settlement day in T2S will apply to all participating CSDs and will therefore allow interoperability across the systems of the participating CSDs. Given that the project is still at an early stage, the operating hours are still indicative and the daily schedule of events will be subject to further discussions with T2S stakeholders for the further definition of details. Nevertheless, according to the current indicative timetable, the change of settlement date occurs at 6.45 pm CET. The first night-time settlement cycle of the settlement day will begin at 7.30 pm CET on the previous day (T-1) and the last night-time cycle will finish at around 3 am CET. Once the last night-time cycle is complete, there will be a maintenance window from 3 am to 5 am CET before real-time settlement automatically begins, lasting until 6 pm CET. Between 6 pm and 6.45 pm CET, end-of-day procedures take place.

4.4.5.5 Risk management

A comprehensive information security framework has been developed and is in the process of being agreed with the CSDs and NCBs. It consists of an information security policy (specifying the scope of the service and stakeholders' roles and responsibilities), a threat catalogue (identifying threats that are relevant for T2S) and a set of security requirements and controls. In addition to this framework, a T2S Information Security Management Guide will be developed explaining in detail which activities will be conducted by whom, in what circumstances. In particular, this Guide will describe two processes (a core process and a review process) in order to ensure that information security risks are identified, monitored, assessed and mitigated and/or accepted, in full compliance with the applicable governance arrangements. It should be noted that the T2S platform is being built on the TARGET2 platform and therefore all the operational risk policies developed for the latter have been used as the basis for establishing the T2S policies. These tools and procedures therefore already have an excellent track record of providing a very high level of security.

In terms of resilience, T2S will also have state-of-the-art disaster recovery plans and procedures in place, which will – even in the most extreme cases – ensure a restart of T2S operations at the standby location, at the latest two hours after the failover decision has been made. T2S will have four data centres located in two regions, which are approximately 1,500 km away from each other, hence eliminating and/or minimising the risk that all data

centres could be affected by the same natural disaster. At any point in time, one region will be the active T2S region, while the other will be on standby.

4.4.5.6 Links to other systems

In T2S, the settlement of cross-CSD DVP transactions, for the CSDs participating in T2S, will be as efficient as domestic DVP settlement. This is achieved by the integration of securities accounts of multiple CSDs and T2S dedicated cash accounts on a single technical platform. To that end, T2S will book securities transfers between participants with different CSDs simultaneously with the corresponding cash movements. It will also automate the realignment process between CSDs on a real-time basis.

Cross-border transactions involving external CSDs, ie involving one or more CSDs that do not participate in T2S, will also benefit from the T2S architecture. The aim in this context is to achieve real-time settlement wherever feasible, but the need to interact with external CSDs and/or platforms will make the settlement procedure more complex in some cases. Specific procedures have been designed, including a conditional securities delivery functionality to address scenarios in which CSDs outside T2S are involved in the settlement process.

4.4.5.7 Pricing

Owing to the current fragmentation of settlement over a multitude of platforms run by different CSDs, settling across borders today still costs many times more than settling within the same country. With T2S, cross-border and domestic transactions will be processed in the same way and therefore at the same cost. Furthermore, all users, large and small, wherever they are located, will benefit from these cost reductions to the same extent.

In November 2010 the Governing Council of the ECB decided that the DVP price for T2S will be set at €0.15 per instruction,³⁶ This price will be fixed for the period when T2S goes live to December 2018, provided that the following conditions are fulfilled:

- the securities settlement volume in the EU is not more than 10% lower than the volumes projected by the T2S Programme Office, which in turn are based on market advice;
- tax authorities confirm that the Eurosystem will not be charged value added tax for T2S services (this condition has already been fulfilled);
- non-euro currencies add at least 20% to the euro settlement volume.

In November 2011, it was also decided to acknowledge the higher testing efforts of CSDs that migrate to T2S early. In that respect settlement fees will be waived for the first three months of T2S operation. After three months of T2S operation and until the last regular migration wave, settlement fees will be reduced by one third. As of the last regular migration wave, the full T2S fees will apply.

These pricing decisions remain consistent with the principle of full cost recovery, while also coinciding with the objective that T2S has always pursued, ie to achieve a settlement fee that is lower than any current domestic fee.

The T2S fees will be only one part of the end-to-end costs of a standard settlement of a securities transaction. On top of the T2S fees for DVP, matching, reporting, etc, CSDs will also need to add on their own fees. Users will also be charged by the network service providers for all messages sent to and from the T2S platform.

³⁶ Two instructions per transaction will be charged.

4.5 Use of the securities infrastructure by the Eurosystem

4.5.1 General information

The Eurosystem makes use of SSSs for the collateralisation of its credit operations related to the implementation of monetary policy and the operation of payment systems. It has an interest in the smooth operation of securities settlement arrangements throughout the euro area, since any significant disturbance in the SSSs may not only have a serious impact on the operation of the whole of the euro area's financial markets, but may also jeopardise the collateralisation process of Eurosystem credit operations.

In order to be eligible as collateral for Eurosystem credit operations, assets must comply with the eligibility criteria defined in the General Documentation on Eurosystem Monetary Policy Instruments and Procedures. This requires that eligible assets be transferable in book-entry form and be held and settled in the euro area through an account with the Eurosystem or, in the case of marketable assets, with an SSS that fulfils the standards established by the ECB, so that perfection and realisation are subject to the law of a euro area country. If the CSD where the asset is issued and the SSS where it is held are not identical, the two institutions must be connected by a link approved by the ECB's Governing Council or the counterparty must use the CCBM.

Such links can be either: (i) direct links, which take the form of an omnibus account opened by an SSS (the investor SSS, ie the SSS where securities are used) in another SSS (the issuer SSS, ie the SSS where securities are issued) and which allow counterparties to hold securities issued in any other SSS and to use these securities within their own country; or (ii) relayed links, whereby one SSS acts as an intermediary on behalf of another SSS for the settlement of international business. The Governing Council of the ECB decided in 2005 that such relayed links between SSSs could be used for the cross-border transfer of securities to the Eurosystem in response to growing demand by market organisations for the acceptance of securities transferred through relayed links.

4.5.2 User assessments of SSSs and links by the Eurosystem

The Eurosystem has set standards for the use of SSSs in its credit operations.³⁷ They were first developed in 1998 and were defined from the user's perspective, thus they were not intended as oversight standards. These user standards aim to ensure that the settlement procedures for collateral provided in Eurosystem credit operations are conducted in a safe and sound manner, thereby preventing the Eurosystem from taking on inappropriate levels of risk.

In order to ensure efficient and consistent execution of the user assessments, the Eurosystem has developed specific methodologies for the assessment of SSSs, links and relayed links. There are many common elements in these methodologies which apply to all assessments, but they also contain specific features in order to detect and mitigate specific risks that relate mainly to the legal and operational setup of systems, links or relayed links.

The final decision as to whether an SSS, a link or a relayed link can be considered eligible for Eurosystem credit operations is taken by the Governing Council of the ECB. Should an SSS not comply fully with the standards, the Eurosystem can issue recommendations to the operator of the system, with the implementation of these recommendations being monitored by the Eurosystem. A continuously updated list of eligible systems and links is available on the website of the ECB.

The first SSS assessment was completed before the start of Stage Three of EMU in 1998, and 29 SSSs qualified at that time. The Eurosystem has stopped using and assessing SSSs

³⁷ Standards for the Use of EU Securities Settlement Systems in ESCB Credit Operations, January 1998.

located in Denmark, Sweden and the United Kingdom, since from 1 July 2003 only securities issued and held in an SSS located in the euro area have been eligible for Eurosystem credit operations. In 2010 there were 23 SSSs eligible for use in Eurosystem credit operations (see Table 5).

Table 5
Eligible SSSs in the euro area
As at August 2009

SSS (country)	Procedures used for Eurosystem credit operations	Other procedures not used by the Eurosystem
NBB SSS (Belgium)	FOP multiple-batch settlement	DVP multiple-batch settlement
Euroclear Bank (Belgium)	FOP real-time settlement	DVP real-time settlement in commercial and central bank money
Clearstream Banking Frankfurt-CASCADE (Germany)	FOP multiple-batch settlement, FOP real-time procedure	DVP real-time settlement
Clearstream Banking Frankfurt am Main-CREATION (Germany)	FOP real-time settlement for daytime and night-time settlement	DVP settlement in commercial bank money
Iberclear (CADE) (Spain)	DVP real-time settlement	–
Iberclear (SCLV) (Spain)	Pre-depositing of securities	DVP multiple-batch settlement
SCL Barcelona (Spain)	DVP real-time settlement	DVP single-batch settlement
SCL Bilbao (Spain)	Pre-depositing of securities	DVP single-batch settlement
SCL Valencia (Spain)	Pre-depositing of securities	DVP single-batch settlement
Euroclear France	FOP real-time settlement	DVP real-time settlement
Monte Titoli (Italy)	FOP real-time settlement. DVP real-time settlement	DVP multiple-batch settlement
Clearstream Banking Luxembourg	FOP real-time settlement for daytime and night-time settlement	DVP settlement in commercial bank money
VP Lux S.à r.l. (Luxembourg)	FOP real-time settlement	DVP real-time settlement
Euroclear Nederland (Netherlands)	FOP real-time settlement	DVP real-time settlement.
OeKB (Austria)	FOP real-time settlement, plus 8 batches for netting purposes	DVP real-time settlement, plus 7 batches for netting purposes
Siteme (Portugal)	DVP real-time settlement	DVP real-time settlement.
Interbolsa (Portugal)	DVP real-time settlement (specifically for Eurosystem operations)	Intraday batch, overnight batch, RTGS (both DVP and FOP) and FOP real-time securities transfers
Euroclear Finland Oy-RM System (Finland)	FOP real-time settlement	DVP real-time settlement
BOGS (Greece)	DVP real-time settlement	DVP multiple-batch settlement
KDD (Slovenia)	FOP real-time settlement	DVP real-time settlement
CDCR (Cyprus)	FOP settlement, pre-depositing of securities	DVP settlement in commercial bank money
MaltaClear (Malta)	FOP settlement, pre-depositing of securities	DVP settlement
CDCP (Slovakia)	FOP real-time settlement	DVP real-time settlement

The first link assessment was completed in May 1999 and 26 links qualified at that time. Several other links were assessed in subsequent years. Currently 54 direct links are eligible for use in Eurosystem credit operations (see Table 6). As far as relayed links between SSSs in the euro area are concerned, the first assessment report was approved in July 2007. Currently there are seven relayed links eligible for use in Eurosystem credit operations (Table 6).

The Eurosystem periodically reviews the level of compliance of eligible systems, links and relayed links with its User Standards, and carries out ad hoc assessments of new links nominated by the market (following contacts between the investor SSS and the relevant NCB).

Although there are a large number of direct and relayed links, relatively few are used extensively. The links which have been assessed so far are used by the Eurosystem for the cross-border transfer of securities on an FOP basis.

Table 6
Eligible direct and relayed links in the euro area

As at 14 August 2009

Country	Eligible direct links
Belgium	Euroclear Bank to the SSS of the National Bank of Belgium (Belgium) Euroclear Bank to Clearstream Banking S.A. (Luxembourg) Euroclear Bank to Clearstream Banking Frankfurt-CASCADE (Germany) Euroclear Bank to OeKB (Austria) Euroclear Bank to Euroclear Nederland (the Netherlands) Euroclear Bank to Euroclear France (France) Euroclear Bank to Monte Titoli (Italy), operated by UniCredito Italiano
Germany	Clearstream Banking Frankfurt-CASCADE to Euroclear France (France) Clearstream Banking Frankfurt-CASCADE to Euroclear Nederland (the Netherlands) Clearstream Banking Frankfurt-CASCADE to OeKB (Austria) Clearstream Banking Frankfurt-CASCADE to Euroclear Finland Oy-RM System (Finland) Clearstream Banking Frankfurt-CREATION to Clearstream Banking S.A. (Luxembourg) Clearstream Banking Frankfurt-CASCADE to Iberclear-CADE (Spain) Clearstream Banking Frankfurt-CASCADE to Monte Titoli (Italy)
Spain	Iberclear-CADE to Clearstream Banking Frankfurt-CASCADE (Germany) Iberclear-CADE to Euroclear France (France) Iberclear-CADE to Monte Titoli (Italy) Iberclear-CADE to Euroclear Nederland (the Netherlands) Iberclear-SCLV to Euroclear France (France) Iberclear-SCLV to Monte Titoli (Italy) Iberclear-SCLV to Euroclear Nederland (the Netherlands)

Table 6 (cont)
Eligible direct and relayed links in the euro area

As at 14 August 2009

Country	Eligible direct links (cont)
France	Euroclear France to Clearstream Banking Frankfurt-CASCADE (Germany) Euroclear France to Monte Titoli (Italy) Euroclear France to OeKB (Austria) Euroclear France to the SSS of the National Bank of Belgium (Belgium) Euroclear France to Iberclear-CADE (Spain) Euroclear France to Euroclear Finland Oy-RM System (Finland) Euroclear France to Clearstream Banking S.A. (Luxembourg) Euroclear France to Iberclear SCLV Spain Euroclear France to Euroclear Bank (Belgium)
Italy	Monte Titoli to Euroclear Bank (Belgium) Monte Titoli to Clearstream Banking Frankfurt-CASCADE (Germany) Monte Titoli to Euroclear France (France) Monte Titoli to OeKB (Austria) Monte Titoli to Iberclear-SCLV (Spain) Monte Titoli to Iberclear-CADE (Spain) Monte Titoli to Clearstream Banking S.A. (Luxembourg)
Luxembourg	Clearstream Banking S.A. to Euroclear Bank (Belgium) Clearstream Banking S.A. to Clearstream Banking Frankfurt-CASCADE (Germany) Clearstream Banking S.A. to SSS of the NBB (Belgium), operated by ING Belgium Clearstream Banking S.A. to OeKB (Austria), operated by Erste Bank Clearstream Banking S.A. to Euroclear Nederland (the Netherlands), operated by BNP Paribas Clearstream Banking S.A. to Monte Titoli (Italy), operated by Banca Intesa S.p.A. Clearstream Banking S.A. to Euroclear France (France) Clearstream Banking S.A. to KDD
Netherlands	Euroclear Nederland to Euroclear Bank (Belgium)
Austria	OeKB to Euroclear Bank (Belgium) OeKB to Clearstream Banking Frankfurt-CASCADE (Germany) OeKB to Euroclear France (France) OeKB to Monte Titoli (Italy) OeKB to Euroclear Nederland (the Netherlands) OeKB to Clearstream Banking S.A. (Luxembourg)
Finland	Euroclear Finland Oy-RM System to Clearstream Banking Frankfurt-CASCADE (Germany) Euroclear Finland Oy-RM System to Euroclear France (France)

Table 6 (cont)
Eligible direct and relayed links in the euro area

As at 14 August 2009

Country	Eligible relayed links
Germany	<p>Clearstream Banking Frankfurt-CREATION (Germany) via CBL (Luxembourg) to Euroclear Nederland (the Netherlands)</p> <p>Clearstream Banking Frankfurt-CREATION (Germany) via CBL (Luxembourg) to the SSS of the National Bank of Belgium (Belgium)</p> <p>Clearstream Banking Frankfurt-CREATION (Germany) via CBL (Luxembourg) to Oesterreichische Kontrollbank (Austria)</p> <p>Clearstream Banking Frankfurt-CREATION (Germany) via CBL (Luxembourg) to Monte Titoli (Italy)</p> <p>Clearstream Banking Frankfurt-CREATION (Germany) via CBL (Luxembourg) to CASCADE (Germany)</p> <p>Clearstream Banking Frankfurt-CREATION (Germany) via CBL (Luxembourg) to Euroclear France (France)</p> <p>Clearstream Banking Frankfurt-CREATION (Germany) via CBL (Luxembourg) to KDD (Slovenia)</p>

For more information on the euro area payments system and the role of the Eurosystem, see the ECB publication entitled “The payment system – payments, securities and derivatives, and the role of the Eurosystem” as well as other information available on the ECB’s website under [Payments & Markets](#).

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

Contents

List of abbreviations	141
Introduction.....	143
1. Institutional aspects	143
1.1 The general institutional framework	143
1.1.1 General legal aspects.....	143
1.2 The role of the Bank of France	145
1.2.1 Oversight.....	145
1.2.2 Security of payment media	146
1.2.3 Prevention of fraud	147
1.2.4 Provision of services.....	148
1.2.5 Cooperation with other authorities	148
1.3 Role of other private and public sector bodies	149
1.3.1 Financial intermediaries authorised to provide payment services	149
1.3.2 Representative bodies.....	150
1.3.3 Regulatory and supervisory authorities.....	150
1.3.4 Other entities	150
2. Payment media used by non-banks.....	151
2.1 Cash payments.....	151
2.2 Non-cash payments.....	151
2.2.1 Non-cash payment instruments	151
2.2.2 Non-cash payment terminals	153
2.2.3 Recent developments.....	154
3. Payment systems	154
3.1 General overview.....	154
3.2 The French component of TARGET2: TARGET2-Banque de France	155
3.3 Retail payment systems.....	155
3.3.1 CORE (COmpensation REtail).....	155
4. Systems for post-trade processing, clearing and securities settlement	157
4.1 General overview.....	157
4.2 Post-trade processing systems.....	157
4.3 Central counterparties and clearing systems	157
4.4 Securities settlement systems	158
4.5 The use of the securities infrastructure by the Bank of France.....	158
4.5.1 The Bank of France as liquidity provider in the SSS	158
4.5.2 Monetary policy operations: marginal lending under the new 3G scheme.....	158

List of abbreviations

ACP	Prudential Supervisory Authority – Autorité de Contrôle Prudentiel
AFECEI	French Association of Credit Institutions and Investment Firms – Association Française des Établissements de Crédit et des Entreprises d’Investissement
AFEI	French Investment Firms Association – Association Française des Entreprises d’Investissement
Afepame	French Association of Payment and Electronic Money Institutions – Association française des établissements de paiement et de monnaie électronique
AMF	Financial Markets Authority – Autorité des Marchés Financiers
ASF	Finance Companies Association – Association des Sociétés Financières
ATM	automated teller machine
CCSF	Financial Sector Consultative Committee – Comité Consultatif du Secteur Financier
CCLRF	Financial Legislative and Regulatory Consultative Committee – Comité Consultative de la Législation et de la Réglementation Financière
CCP	central counterparty
CFONB	French Committee for Banking Organisation and Standardisation – Comité Français d’Organisation et de Normalisation Bancaires
CLS	Continuous Linked Settlement
CMF	Monetary and Financial Code – Code Monétaire et Financier
CORE	Retail payment system – COmpensation REtail
CPSS	Committee on Payment and Settlement Systems
CSD	central securities depository
DVP	delivery versus payment
EBA	Euro Banking Association
EEA	European Economic Area
e-RSB	French interbank authorisation network
ESCB	European System of Central Banks
ESES	Euroclear Settlement of Euronext-zone Securities
Euroclear France	French CSD, previously Sicovam SA
FBF	French Banking Federation – Fédération Bancaire Française
FCC	Central Cheque Register – Fichier Central des Chèques
FNCI	National Register of Irregular Cheques – Fichier National des Chèques Irréguliers
FSB	Financial Stability Board
GCB	Bank Card Consortium – Groupement Cartes Bancaires

France

GUF	SWIFT Users Group in France – Groupement des Utilisateurs SWIFT en France
IEDOM-IEOM	Monetary Institutes of the French Overseas Departments and Territories – Institut d'émission des départements d'outremer, Institut d'émission des territoires d'outremer
LCH.Clearnet SA	Clearing house and central counterparty for financial instruments
POS	point of sale
RGV2	High-speed Relit system 2 – Relit Grande Vitesse 2
RTGS	Real-time gross settlement
SCT	SEPA credit transfer
SEPA	Single Euro Payments Area
SFPMEI	Special purpose credit institution for issuing e-money – Société Financière du Porte-monnaie Électronique Interbancaire
SSP	Single Shared Platform: single technical platform of TARGET2
SSS	Securities settlement system

Introduction

France has two interbank payment systems, one for large-value payments and one for retail payments. The large-value system is the RTGS [TARGET2-Banque de France](#), which forms part of [TARGET2](#) and is at the heart of the French organisation for interbank and customer payment transactions. TARGET2 replaced the TARGET large-value euro payment system in May 2008. The new French system CORE (COmpensation REtail) that handles retail payments by clearing interbank exchanges of cashless [payment instruments](#) was launched on 28 January 2008, replacing the SIT system (Système Interbancaire de Télécompensation) set up in 1992.

[LCH.Clearnet SA](#) provides clearing for financial instruments. Settlement and delivery of securities are performed by Euroclear Settlement of Euronext-zone Securities ([ESES France](#)). Through its link to the RTGS system and a sophisticated mechanism for self-collateralisation, ESES France provides for continuous intraday final DVP in central bank money. ESES France operates on a common platform with the Dutch and the Belgian securities settlement systems (SSSs) of the Euroclear Group.

All French payment and securities clearing and settlement systems settle in central bank money in accounts held with the Bank of France.

As for the oversight of these systems, Article L 141-4 of the Monetary and Financial Code (Code Monétaire et Financier – CMF) gives the Bank of France broad competence to ensure the smooth operation and security of payment and securities clearing and settlement systems. It also confers statutory powers vis-à-vis the issuers of means of payment regarding security matters. In addition, to carry out its task of overseeing means of payment, the Bank of France is authorised by law to gather any necessary information.

Since 2007 the infrastructure of payments and securities has been transformed in France. This is due to European integration of means of payment and transfer systems, with the start of the implementation of the Single Euro Payments Area (SEPA) and the launch of new pan-European exchange platforms that have replaced the former infrastructures used on the Paris financial market.

1. Institutional aspects

1.1 The general institutional framework

1.1.1 General legal aspects

1.1.1.1 Issuance of means of payment

This field has been radically transformed by the Payment Services Directive 2007/64/EC, transposed into French law by an executive order published on 16 July 2009, establishing a harmonised legal framework for payment services throughout Europe in order to facilitate the implementation of European payment instruments and their adoption by final users, thus facilitating the implementation of the SEPA project, and creating a new category of non-banking payment services providers: the payment institutions.

Means of payment are defined broadly by Article L 311-3 of the CMF as “all instruments which, irrespective of the medium or technical procedure used, enable any person to transfer funds”. The issuance and management of means of payment, which were defined as banking operations, are now defined as payment services, and can be provided both by banks and by payment institutions.

The CMF governs banking and payment services activities and the conditions for executing such services in France.

According to the CMF, only credit institutions, the Treasury, the Post Office, the public trustee office (Caisse des Dépôts et Consignations), the Bank of France and the monetary institutes for the French Overseas Departments and Territories (IEDOM-IEOM), and payment institutions may provide and execute payment services, ie issue and process means of payment, as a regular part of their business.

When Directive 2009/110/EC enters into force in French law, electronic money institutions will also be authorised to provide and execute payment services. Provisions related to authorisations comply with the EU principle of mutual recognition of licences (only one authorisation needed), and of supervision by the authorities of the home member state, set by the Banking Directive 2000/12 and the Investment Services Directive. These provisions are codified in the CMF in Articles L 511-22 to L 511-28, L 522-12 to L 522-13 and L 532-23 to L 532-27.

The Bank of France has a statutory responsibility to exercise oversight over all non-cash means of payment, ie all except banknotes and coins, which are governed by other rules, within the framework of the European System of Central Banks (ESCB).

1.1.1.2 Functioning of payment and securities clearing and settlement systems

The Act of 31 December 1993 abolished the “zero hour”¹ rule in payment systems by amending the French Banking Act (Article 93-1, now CMF L 330-1). Since the implementation of this provision, netting arrangements for payment systems have been legally binding in the event of failure by a participant and the finality of payments in RTGS systems cannot be legally challenged, provided the systems comply with the legal definition of payment systems. The protection against any “zero hour” provisions also applies explicitly to SSSs. Directive 98/26 on settlement finality in payment and securities settlement systems has set common rules stipulating that transfer orders and netting must be legally enforceable once they have been entered into the system, even in the event of an order to commence judicial reorganisation or liquidation proceedings being made against a participant; that transfer orders may not be revoked after a moment defined in the system; that the insolvency of a participant may not have retroactive effects; and that the insolvency law applicable is the law of the Member State which has notified the system to the EC since it was the applicable law chosen by its participants. It has been transposed into French law, complementing the existing French provision (L 330-1 and L 330-2).²

The scope of protection granted for transfer orders processed in systems has been extended to night-time settlement and to settlement between linked systems in Directive 2009/44 amending Directive 98/26.

The legal basis for collateral arrangements in payment and securities settlement systems is Article L 330-2 of the CMF. This stipulates that regulations, master agreements or standardised agreements governing payment or multilateral settlement systems may provide for collateral arrangements in order to secure settlement within the system, and that collateral security provided to a system by a participant may not be affected by the opening of insolvency proceedings against that participant. The collateral eligible under the specific regime of Article L 330-2 is widely defined (transfer of claims, securities, guarantees, etc). The transfer of collateral is performed through a transfer of full ownership without any formal requirement to inform third parties and is enforceable notwithstanding the provisions of

¹ The zero hour rule deems an insolvency to begin at “zero hour” on the day the insolvency occurs. This means that payments made any time after midnight might be deemed void, entailing a lot of unwinding of payments.

² See Monetary and Financial Code (Part III: Payment systems and systems used for settlement and delivery of financial instruments, Articles L 330-1 and L 330-2).

French insolvency law³ or the equivalent provisions governing any judicial or amicable proceedings instituted outside France and any civil enforcement proceedings or exercise of a right.

Securities clearing systems being notified as SSSs, the provisions of both acts also apply to central counterparties (CCPs).

1.1.1.3 Legal basis for oversight functions

The Founding Treaty of the European Community states that the Bank of France shall ensure the smooth operation and the security of payment systems within the framework of the tasks of the ESCB relating to the promotion of the smooth operation of payment systems (Article L 141-4 of the CMF). In addition, it states that “notwithstanding the competences of the Financial Markets Authority and of the Prudential Supervisory Authority, the Bank of France shall ensure the security of securities clearing and settlement systems”. This provision establishes oversight of payment and securities settlement systems as well as CCPs as an integral part of the Bank of France’s statutory tasks within the Eurosystem. For payment security, the oversight role of the Bank of France has been enshrined in law by adding the following amendment to Article L141-4 of the CMF, which grants the Bank of France greater means of action:

“The Bank of France shall ensure the security of means of payment, other than banknotes and coins, as defined in Article L 311-3, and the relevance of the standards applicable thereto. If it deems that any such means of payment is insufficiently secure, it may recommend that the issuer take all necessary measures to remedy such insufficiency. If its recommendations are of no avail, it may, after having solicited the observations of the issuer, hand down a negative opinion published in the Official Journal. For the performance of its duties, the Bank of France shall conduct expert analyses and shall ask the issuer or any interested party for all relevant information concerning means of payment and the terminals or technical facilities associated therewith.”

With respect to securities clearing and settlement systems, Article L 621-7-VI 3) of the CMF (previously Article L 622-7-IV) states that the general regulations of the Autorité des Marchés Financiers (AMF) – Financial Markets Authority – shall specify “the general organisational and operational principles of securities settlement systems and the conditions under which the AMF approves the operating rules of such systems, without prejudice to the competences granted to the Bank of France by Article L 141-4 of the CMF” as mentioned above.

1.2 The role of the Bank of France

1.2.1 Oversight

Payment systems oversight forms an integral part of the Bank of France’s statutory tasks. It performs its duty of ensuring “the smooth operation and the security of payment systems within the framework of the tasks of the European System of Central Banks (ESCB) relating to the promotion of the smooth operation of payment systems” through the provision of settlement services, the definition of recommendations and supportive action aimed at facilitating private sector initiatives contributing to a safe and efficient functioning of payment systems.

Pursuant to Article L 141-4 of the CMF, the statutory competence of the Bank of France in the field of payment systems oversight also explicitly covers SSSs and CCPs.

³ Book VI of the Commercial Code.

There are four strands to the exercise of oversight: defining the principles or standards applying to systems; monitoring their implementation; overseeing the actual conditions of operation and use through assessments; and issuing recommendations to system operators asking them to remedy any malfunctions observed during the assessment. Consequently:

- The Bank of France participates actively in the definition of new international and European standards (CPSS/IOSCO working group, G20 central banks committee – Committee on Payment and Settlement Systems (CPSS) – and FSB and in cooperation with ESMA for the technical standards in its field of competence).
- The Bank of France regularly assesses the systems according to the standards in force and may also decide to carry out audits. In addition, the central bank periodically meets the managers of the systems in order to consider possible operational problems and to assess the envisaged evolutions;
- The Bank of France, in cooperation with other authorities, is consulted regarding system operators' planned strategies and any change in the operating rules. The Bank of France may oppose these strategies or changes if they do not comply with the standards and principles.
- In order to monitor the functioning of payment systems, the Bank of France has set up a statistical observatory, which among other things monitors the behaviour of participants in these systems. In case of operational problems in the systems, the Bank of France is immediately informed of the latest developments, and consulted with regard to the measures necessary to avoid any spillover effect.

1.2.2 Security of payment media

The legal framework of the Bank of France's oversight mission on the security of payment media has been significantly strengthened by law (Article L 141-4).

According to its statutory powers in security matters, the Bank of France is entitled to monitor the security level of the different payment media and to make recommendations. To fulfil its mission, the Bank of France considers that the security of payment media is based on the following three elements that are relevant for its oversight role:

- the soundness of the issuer, which faces risks that may threaten its stability and could lead to systemic effects while undermining public confidence in the means of payment;
- the stability of agreements between all the parties involved in payment relationships. These agreements are essential for the protection of users against several kinds of risks, such as financial losses, non-execution of the transaction on the agreed conditions and fraud; and
- the technical and organisational security dedicated to the protection of payment media against all types of threats. For each means of payment, the Bank of France analyses possible threats to its security, defines the minimum security objectives to which it must conform, and monitors that the resources implemented are adequate to meet those minimum objectives.

In addition, the law allows the Bank of France to conduct expert analyses and ask the issuer or any interested party for all relevant information concerning payment media and the associated terminals or technical facilities. If the Bank of France deems any means of payment to be insufficiently secure, it may recommend that the issuer take all necessary measures to remedy such insufficiency. If its recommendations are to no avail, it may, after

having solicited the observations of the issuer, publish a negative opinion about the issuer in the French Official Journal.⁴

As an example of its ongoing efforts to strengthen the security of means of payment, the Bank of France invited banks to improve the authentication of users of online banking payment services, which are gaining wide popularity. Moreover, banks were called upon to generalise the use of high-quality watermarks on bank cheques in order to improve their protection against counterfeiting.

Furthermore, the implementation of SEPA has involved setting up a harmonised Eurosystem oversight framework, which now covers the oversight of means of payment conducted by the Bank of France.

1.2.3 Prevention of fraud

The role of the Bank of France as a service provider in the field of payment instruments relates to its responsibilities regarding two national registers that help to ensure the security of card and cheque payments.

As part of the prevention system on cheque and payment card security defined in Articles L 131-85 to L 131-87 of the CMF, the Central Cheque Register (Fichier Central des Chèques – FCC) stores centralised information on cheque payment incidents and the resulting bank-imposed and court-ordered cheque-writing bans. Pursuant to an agreement, the FCC keeps a central record of bank card confiscations by institutions belonging to the Bank Card Consortium (Groupement Cartes Bancaires – GCB). Access to the FCC is restricted to credit institutions and payment institutions either prior to the issuing of a chequebook, or before granting a loan.

The above-mentioned provisions also state that anyone who receives a cheque in payment is entitled to obtain information from the Bank of France as to whether the cheque is regular. To provide this service, the Bank of France keeps a central record in the National Register of Irregular Cheques (Fichier National des Chèques Irréguliers – FNCI) of all incidents affecting the regularity of cheques drawn on a bank account. These may include loss or theft of chequebooks, account closures and details of all accounts held by individuals or firms that have been banned from writing cheques. As authorised by a Decree of the Minister of the Economy and Finance dated 24 July 1992, the Bank of France has delegated responsibility for implementing the procedures for consultation of the FNCI, especially by retailers, to a company called Mantis. This company provides a service allowing access to the Register operating under the name VERIFIANCE-FNCI.

Created in 2001 by law (CMF Article L 141-4 5th), the Observatory for Payment Card Security seeks to promote information sharing and consultation between all parties concerned by the smooth operation and security of card payment schemes. It brings together members of Parliament, consumers' and merchants' representatives, payment card issuers and public authorities. The secretariat of the Observatory is provided by the Bank of France.⁵ Among other things, the Observatory monitors the implementation of measures adopted by issuers and merchants to strengthen payment card security, compiles fraud statistics on the basis of

⁴ All laws voted by Parliament and decrees taken by the government or ministries must be published in the "Official Journal of the French Republic". Publication serves two purposes: (a) for a text to be known by everyone; (2) for a text to enter into force. Publication of laws and decrees is therefore required for their dispositions to have legal effect. Several other regulatory texts and decisions made by public authorities must be published in the French Official Journal if this is specified in the law.

⁵ Its president is appointed from among its members by the Minister for the Economy. Since 17 November 2003, Christian Noyer, the Governor of the Bank of France, has been President of the Observatory.

the relevant information disclosed by payment card issuers and maintains a technology watch in the payment card field. The Observatory draws up an activity report each year which is sent to the Minister for the Economy and communicated to Parliament.

1.2.4 Provision of services

The Bank of France operates the French component of TARGET2, TARGET2-Banque de France. In that respect, the Bank of France maintains the accounts of TARGET2-Banque de France participants as well as of ancillary systems connected to TARGET2-Banque de France, and manages the related conventions and databases.

The situation of accounts in central bank money of all participants and ancillary systems is monitored throughout the day to ensure that transfer orders are properly executed. Support is provided to both internal and external customers. Financial institutions and ancillary systems, as well as in-house back offices, are offered support, operational monitoring development, control and reporting services.

The Bank of France participates in and organises working groups and regular meetings with key institutions and infrastructure providers in order to improve customers' knowledge of TARGET2-Banque de France.

1.2.5 Cooperation with other authorities

The integration of financial markets and infrastructures in the securities field in the euro area has led the monitoring authorities of the countries concerned to implement joint supervision of these activities. Memoranda of understanding (MoUs) have been signed by several European authorities relating to the joint implementation of their respective responsibilities in terms of oversight, regulation and supervision.

The action of the authorities in charge of the oversight and regulation of LCH.Clearnet SA and LCH.Clearnet Group is coordinated under the existing cooperation framework. This framework is being completed by the conclusion of memoranda of cooperation between the relevant authorities.

An MoU has been signed between the Dutch, Belgian and Portuguese regulatory authorities and the French authorities in charge of the supervision of LCH.Clearnet SA for coordinated regulation, supervision and oversight of the clearing activities of LCH.Clearnet SA related to the Euronext markets. A committee has been set up for this purpose (Coordination Committee on Clearing (CCC)). The cooperation among these authorities is coordinated by a Permanent Secretariat currently held by the Bank of France.

An MoU has also been signed between the authorities in charge of the supervision of LCH.Clearnet SA – the Prudential Supervisory Authority (Autorité de Contrôle Prudentiel (ACP)) – and those in charge of the supervision of its sister company, the London-based clearing house LCH.Clearnet Ltd (the UK FSA and Bank of England), for exchange of information at the level of the Group. A committee has been set up for this purpose (Joint Regulatory Authorities (JRA)) as well. The cooperation among these authorities is coordinated by a Permanent Secretariat currently held by the Bank of France.

Concerning Euroclear Group, the relevant authorities of the central depositories that are subsidiaries of Euroclear SA/NV, the shareholder holding company of the central depositories of the group, have set up a cooperation framework to ensure the oversight of this company. This framework was formalised in an MoU signed in April 2005,⁶ according to

⁶ The signatory authorities of the April 2005 MoU are the Bank of France, the AMF, the Netherlands Bank, the Dutch Autoriteit Financiële Markten, the Bank of England, the UK Financial Services Authority, the National

which the Belgian authorities have the prime responsibility for the supervision and oversight of Euroclear SA/NV. The cooperation framework thus defined aims at ensuring a coordinated oversight and regulation of the services offered by Euroclear SA/NV to the different central depositories of the group to carry out their securities settlement activities. From a practical perspective, this cooperation framework relies on a Technical Committee and a High Level Committee that brings together representatives of the relevant oversight authorities (initially the Belgian, Dutch, French and UK authorities, and, since 2009, also the Finnish and Swedish authorities).

Following the launch of the new ESES Operating Model in September 2010, an MoU on cooperation concerning the supervision and oversight of the settlement operations performed by Euroclear France for Euroclear Belgium has been elaborated and approved between the National Bank of Belgium, Financial Services and Markets Authority (FSMA), the AMF and the Bank of France, and is currently being signed by these authorities. The cooperation aims to allow the Belgian authorities to continue to supervise compliance by EBE (ESES Belgium) with Belgian legal requirements.

The Continuous Linked Settlement (CLS) system provides settlement for foreign exchange trades in 17 currencies and is subject to coordinated oversight by the G10 central banks and the central banks that issue currencies settled in this system, including the Bank of France (under the primary responsibility of the US Federal Reserve). An MoU between the central banks participating in the oversight, the G10 central banks and the central banks that issue currencies eligible for CLS was adopted in 2008. The Bank of France is a party to this MoU, which organises the exchange of information and the joint oversight of CLS, under the primary responsibility of the US Federal Reserve System.

In addition, the Bank of France, along with the other G10 central banks, is involved in the cooperative oversight framework of the service provider SWIFT (under the primary responsibility of the National Bank of Belgium).

The Bank of France also takes part in the assessments of the compliance of French card payment systems with the oversight framework established by the Eurosystem and partners other Eurosystem national central banks to assess several international systems operating in France.

1.3 Role of other private and public sector bodies

1.3.1 Financial intermediaries authorised to provide payment services

Following the merger and consolidation process within the financial sector, there were 683 credit institutions conducting their business in France at the end of 2010,⁷ compared with 1,035 in 2001 and 1,608 in 1994. Of these, 206 were commercial banks licensed as all-purpose institutions to conduct a broad range of activities; 119 were cooperative banks, savings banks or municipal banks; 287 were finance companies (*sociétés financières*), which are not allowed to take deposits from the public for less than two years and the activities of which are restricted in accordance with their status; and three were specialised financial institutions (*Institutions Financières Spécialisées*) entrusted by law with a permanent public

Bank of Belgium and the Belgian Commission Bancaire, Financière et des Assurances (now FSMA), the last two having primary responsibility for the supervision and oversight of Euroclear SA/NV. The MoU was updated in 2009 and signed then also by Finansinspektionen (FI), Sveriges Riksbank, Finanssivalvonta / Finansinspektionen (FIN-FSA), and Suomen Pankki – Finlands Bank (the Bank of Finland). An updated version integrating the 2011 changes among Belgium regulators is currently being signed by the signatory authorities listed here.

⁷ Or 711 if the 28 branches of institutions incorporated in third countries are counted.

interest mission (and unable to engage in banking operations other than those pertaining to that mission). Finally, there were 68 branches of credit institutions incorporated in the European Economic Area (EEA), as well as 28 branches of credit institutions incorporated in third countries.

The Post Office Bank, licensed as a credit institution in 2005 and supervised since then by the ACP, has replaced the former Postal Cheque Centres.

The number of domestic branches of all credit institutions totalled 38,958 at the end of 2010 (including those of the Post Office Bank).

1.3.2 Representative bodies

Credit institutions and investment firms are collectively represented in their relations with the public authorities through a two-tier system:

- Institutions that are not members of banking networks must belong to a professional association, such as the French Banking Federation (Fédération Bancaire Française – FBF) for banks, the Finance Companies Association (Association des Sociétés Financières – ASF) for finance companies, the French Investment Firms Association (Association Française des Entreprises d'Investissement – AFEI) for investment firms, and the French Association of Payment and Electronic Money Institutions (Association française des établissements de paiement et de monnaie électronique – Afepame) recently created for payment institutions.
- The central bodies of the banking networks and professional associations mentioned above are affiliated to the French Association of Credit Institutions and Investment Firms (Association Française des Établissements de Crédit et des Entreprises d'Investissement – AFCEI), which represents all credit institutions, payment institutions and investment firms, provides information to its members and to the public, studies all issues of common interest and prepares relevant recommendations.

1.3.3 Regulatory and supervisory authorities

The advice of the Financial Legislative and Regulatory Consultative Committee (Comité Consultative de la Législation et de la Réglementation Financière – CCLRF) must be sought by the Minister for the Economy for any European legislation project related to insurance, banking, payment service providers or investment firms (except for the acts that refer to the AMF or are in the scope of its competence). The advice of the CCLRF must also be sought before any general regulation is made applicable in these fields, and must be followed.

The ACP, which is chaired by the Governor of the Bank of France, is responsible for supervising and licensing credit institutions, investment firms and payment institutions.

The AMF has responsibilities regarding regulated markets and the establishment and monitoring of compliance with rules related to the provision of investment services and to securities markets.

1.3.4 Other entities

The Financial Sector Consultative Committee (Comité Consultatif du Secteur Financier – CCSF) examines questions concerning the relations between credit institutions, payment institutions, investment firms and insurance companies on the one hand, and their respective customers on the other, and proposes appropriate measures, particularly in the form of opinions or recommendations of a general nature. The CCSF is consulted by the Minister for the Economy, by the ACP or bodies representing these customers and professional unions. Several entities have been established to study, discuss and coordinate the evolution of the

payment systems infrastructure, both in general and in banking terms, as well as in terms of technical change and standardisation.

The Banking Mediation Committee, chaired by the Governor of the Bank of France, is responsible for establishing the framework for mediators' activity, ensuring the mediators' independence, and reviewing their reports with a view to preparing an annual report on banking mediation submitted to the CCSF.

The French Committee for Banking Organisation and Standardisation (Comité Français d'Organisation et de Normalisation Bancaires – CFONB) is the French banking standard-setting body and a forum for studying the modernisation of banking organisation.

A number of economic interest groupings (Groupements d'Intérêts Économiques – GIE) are also active in the field of payment systems, in particular the SWIFT Users Group in France (Groupement des Utilisateurs SWIFT en France – GUF), and the Bank Card Consortium (Groupement Cartes Bancaires – GCB; see Section 2.2.1.4).

2. Payment media used by non-banks

2.1 Cash payments

Cash payments include transactions using euro banknotes and coins, which are accepted anywhere in the euro area. Although all euro notes in circulation are exactly the same, euro coins have a common side and a national side. Collector coins have also been issued in France, and are legal tender only in France.

No statistics are available on the amount of cash payments in France, nor is there any reliable recent survey. While non-cash payments represent the major part of payments by value, cash remains the most widely used payment instrument by volume. In 2009, the total value of banknotes withdrawn from ATMs, and thus used for cash payments, amounted to more than EUR 120 billion, ie 1.6% of GDP. As one note can be used repeatedly for payment, the real number and value of cash transactions are higher.

2.2 Non-cash payments

2.2.1 Non-cash payment instruments

2.2.1.1 Credit transfers

Credit transfers accounted for 17.5% of all cashless payment transactions in 2010. They are primarily used by companies, government agencies and local authorities, and rarely by individuals. Credit transfers are the fourth most used payment instrument in France after bank cards, direct debits and cheques. The average value of credit transfers executed for customers in 2010 was EUR 7,158. In comparison, they represented 17.5% of all cashless payment transactions in 2006 with an average value of EUR 6,770.

The interbank exchange of all credit transfers takes place in paperless form. They are predominantly processed through the retail payment system CORE (see Section 3.3.1) and, in the case of cross-border payments, STEP2 operated by the Euro Banking Association (EBA). Ordinary transfers are generally settled on the day of presentation, although banks have until the following day to process SEPA credit transfers (SCT). Credit transfers for payment on a due date (which remain rare) are presented two or three days in advance of interbank settlement.

The SCT was launched in France on 28 January 2008. Its take-off has been slow given the technical adjustments necessary for its implementation. In 2008, SCT represented only

0.34% of all credit transfers processed by payment systems, and 0.90% in 2009. As public administrations have gradually started to migrate towards the SCT, these numbers increased significantly over the course of 2010 and 2011. By July 2011, SCT accounted for 21.2% of all credit transfers processed by CORE.

Certain types of automated transfers meet specific needs. Credit Transfers from Abroad (Virement d'Origine Extérieure – VOE) enable banks established in France to send a transfer received from abroad via CORE to the payee's bank along with the information needed by the payee, such as the exchange rate applied and the commission charged. Initiated through a home banking service in settlement of an invoice, Referenced Credit Transfers (Virement Référencé – VR) allow banks to transmit the creditor's references along with the credit transfer.

2.2.1.2 *Direct debits*

Direct debit has been a very popular means of payment ever since its introduction in 1955. In 2010, over 3.4 million direct debits were exchanged, with an average transaction value of EUR 329. They accounted for 19.99% of all cashless payment transactions processed over the course of the year. In comparison, direct debits accounted for 18.32% of all cashless payment transactions in 2006 with an average value of EUR 358.

Direct debits are generally used for recurrent payments such as electricity, gas, telephone, insurance and water bills, and for monthly income tax. They are advantageous for banks (the processing cost being relatively low due to automation), utility companies (by simplifying their accounting administration) and individuals (by simplifying payment). Direct debits are processed through the same retail payment systems as credit transfers.

The SEPA direct debit was launched on 1 November 2010. To date, it represents a very small fraction of all direct debit transactions processed in France, although a number of important billers planned to migrate to this new instrument over the course of 2011.

Initiators of direct debits must be approved by a bank and obtain signed authorisation from the payer. With national legacy direct debits, this signed authorisation is sent to the payer's bank, whereas it is kept by the initiator in the case of a SEPA direct debit. Before transmitting the direct debit order to its bank for collection, the initiator must notify the payer of the amount and date of the debit (by sending an invoice, for example). This allows the latter to ensure that there are sufficient funds on his/her account or to contest the order if he/she so wishes.

2.2.1.3 *Cheques*

Cheques have traditionally been the most widely used payment instrument in France, being free of charge for the drawer and considered by customers as easy to use for both remote payments and face-to-face transactions. Approximately 3.1 billion cheques, with an average value of EUR 585, were processed by payment systems in 2010. This instrument has nevertheless experienced a steady decline in its relative share of cashless payments, losing its prominence in 2003. Whereas cheques still represented 25.62% of all cashless payment transactions in 2006, this number had fallen to 18.31% by 2010.

It is worth noting that cheques have followed the general trend towards the dematerialisation of payment instruments. Starting in 2001, French cheques have been truncated, with only 1.81% of cheques now circulating physically.

2.2.1.4 *Card payments*

Debit cards

Since 2003, bank cards have been the most popular payment instrument in France, representing 43.4% of all cashless transactions in 2010, for an average transaction value of EUR 49. In comparison, they accounted for 37.6% of all transactions in 2006. Debit cards

represent the vast majority of bank cards used in France. Thanks to a nationwide network of POS terminals and ATMs, they allow their holders to execute both payments and cash withdrawals.

Debit cards may be four-party cards, if the institutions that issue the cards are not the same as the ones acquiring the card transactions. In France, these interbank cards are mainly represented by the GCB and are very often co-branded with Visa or MasterCard, hence allowing cardholders to make payments abroad. Three-party cards where the same institution issues the cards and acquires the card transactions (eg American Express) also exist on the French market.

The Banking Service Network (e-RSB) is used for the transmission of authorisations for withdrawals and payments. This real-time network enables an ATM or a POS terminal to obtain authorisation from the bank which has issued the card, hence guaranteeing the payment for the beneficiary. Card transactions are predominantly cleared in CORE and settled in TARGET2.

The debit cards issued by credit institutions have to meet the technical and security standards set by the scheme owners. Cards are now systematically equipped with a microprocessor, resulting in an exceptionally low level of card fraud at the national level (with a rate of 0.014% for proximity payments and 0.019% for cash withdrawals).

Credit cards, travel and entertainment cards

Even though credit card issuers do not traditionally take deposits from their clients, French law forbids any organisation that is not a registered credit institution from issuing credit cards. In recent years, a growing number of deposit banks have started issuing credit cards in addition to debit cards. Today, the main issuers are BNP Paribas Personal Finance ("carte Aurore", 6.6 million cards in circulation in 2009), Finaref (5.5 million cards), Cofinoga (4.5 million cards), Accord (3.3 million cards), Sofinco (2.4 million cards) and Cofidis (1.9 million cards).

Retailer cards

Businesses are allowed to issue single-purpose cards on condition that these cards be used only to acquire goods or services on their premises. On the basis of a commercial agreement with the issuer, the use of single-purpose cards can be broadened to a limited network of service providers. There are a large number of such retailer cards in France as they are seen as an efficient way to build customer loyalty.

2.2.1.5 Other payment instruments

Bills of exchange and promissory notes represented 0.8% of all cashless payment transactions in 2006 and only 0.6% in 2010. Over the course of that year, 101 million payments were executed using one of these two instruments, for an average transaction value of EUR 3,707. This decrease in usage should continue in the near future as companies continue to change over to credit transfers.

2.2.2 Non-cash payment terminals

By the end of 2010, 56,243 ATMs had been installed nationwide. This represents a 5.3% increase from 2008. In addition, there were 1.29 million POS terminals in operation. ATMs and POS terminals are interoperable. The majority of ATMs may also serve as e-money terminals supporting Moneo cards for reloading.

2.2.3 Recent developments

2.2.3.1 Electronic money

The market for non-traditional means of payment has witnessed two major developments in recent years.

First, while the electronic purse has traditionally been based on solutions where the monetary value is stored on the device (as is the case with Moneo cards), an increasing number of products use cards only as a means of accessing prepaid accounts held centrally with the issuer. This market started with the growing practice of offering traditional paper-based products such as traveller's cheques or gift cheques in an electronic form. It took off in the most recent months due to the emergence of new distribution channels for anonymous prepaid cards, which consist mostly in proximity retailers.

That said, the former type of electronic purse has not lost its prominence: in 2010, Moneo cards accounted for over 41 million payments, with an average transaction value of EUR 2.22. The electronic money used by these traditional electronic purses is issued by the Société Financière du Porte-monnaie Électronique Interbancaire (SFPMEI, a credit institution specialised in issuing e-money), whose role is to collect and manage the funds received in the issuing process. The SFPMEI also defines the security requirements (technical and organisational) for the Moneo scheme and guarantees that the e-money it issues can be redeemed by all e-money holders.

The second major development in the market for non-traditional means of payments is the growing trend towards the use of new devices for executing payments, as shown by the increasing number of payments made via the internet and mobile phones. Even if no data are currently available, server-based solutions that enable internet transactions from a dedicated account held centrally with the issuer are becoming more and more popular, especially through the use of prepaid payment cards. The adoption of the revised E-Money Directive (Directive 2009/110/EC) should also favour the emergence of new electronic money-based solutions on the market.

2.2.3.2 Contactless payments

Payment solutions based on contactless technologies are beginning to enter the market: contactless cards are now in circulation and trials are being held for mobile phone payments. Société des Paiements Pass (S2P, now Carrefour Banque) has led the way in marketing contactless cards. In 2009, it issued 2.5 million Pass cards, which are accepted in Carrefour shops. Moneo has also been offering electronic purses in the form of contactless cards since 2006 and has 500,000 cards in circulation. Contactless payment cards by Visa and MasterCard (payWave and PayPass respectively) were launched on a trial basis in Caen and Strasbourg in September 2009, and entered into a pre-deployment phase in 2010 in Nice. To date, 1,000 compatible terminals and 3,000 mobile phones allowing for contactless communications have been deployed.

3. Payment systems

3.1 General overview

The current structure of the French payment systems (excluding SSSs) consists of one large-value payment system and one retail payment system:

- Large-value operations are processed in TARGET2. However, legally speaking, TARGET2 is not a single system, but a technical platform hosting several TARGET2 national components. The French component of TARGET2 is TARGET2-Banque de

France, which is a real-time gross settlement system (RTGS) where transactions are continuously settled in central bank money and on a gross basis.

Retail operations are processed in the French automated clearing house, namely CORE (COmpensation REtail). This is a deferred net settlement system where the balances resulting from a business day's operations are settled on a net basis through the accounts held by participants in TARGET2-Banque de France.

3.2 The French component of TARGET2: TARGET2-Banque de France

The French RTGS system, TARGET2-Banque de France, started operating in euros on 18 February 2008. The Bank of France manages the relationship with TARGET2-Banque de France participants, while the Single Shared Platform of TARGET2 (SSP) ensures the technical management of financial institutions' accounts open on the books of participating central banks (see the descriptive Red Book chapter on the euro area).

3.3 Retail payment systems

3.3.1 CORE (COmpensation REtail)

Designed by the company Systèmes Technologiques d'Echange et de Traitement (STET), a private operator owned by five major French banks, the system CORE was created in 2005 and operations began in January 2008. Migration from the former single French retail payment system, Système Interbancaire de Télécompensation (SIT), was completed in October 2008. All retail cashless payments are now exchanged electronically through CORE.

3.3.1.1 Institutional framework

Legally, CORE is a payment system under the French jurisdiction which currently serves only the French banking community.

Direct participants sign legally binding agreements detailing their financial and technical responsibilities. They sign three agreements with STET: a Payment System Agreement,⁸ a Service Contract⁹ and a Guarantee Agreement.¹⁰

The Customer Committee is the decision-making body for the system. Technical issues are dealt with by specific committees (Operational Committee, Technical Committee) and crisis committees can intervene for urgent financial problems, such as liquidity or solvency issues affecting a participant, threatening the completion of daily settlement operations.

3.3.1.2 Participation

CORE has a two-tier participation setup. All banks sending or receiving payments eligible for CORE must participate in the system as either direct or indirect participants:

⁸ The Payment System Agreement covers access criteria, obligations and liability of participants, irrevocability rules, clearing procedure, settlement procedures, financial safety mechanism, concentration risk rules, pricing list, confidentiality rules, suspension and termination, governing law and arbitration clause in case of litigation.

⁹ The Service Contract defines services supplied and technical processes executed by CORE as well as the commitments and obligations resulting for the contracting parties in two parts: one general and one specific to the direct participant.

¹⁰ The Guarantee Agreement defines the rights and obligations of each direct participant in the Financial Safety Mechanism, the role and obligations of STET as the operator of the mechanism and of the Bank of France as the custodian of the account in which the cash deposits are kept.

- Direct participants can send and receive payments for their own account or on behalf of indirect participants. The responsibilities of direct participants are both financial and technical and extend to the institutions they represent. There were 10 direct participants at the end of 2011.
- Indirect participants (389 at the end of 2011) send and receive payments via a direct participant.

Rules of access for direct participants and indirect participants rely on a set of statutory, financial and technical criteria and requirements, in accordance with the system rules and the legal framework.

3.3.1.3 *Types of transactions*

CORE was designed to cover all the payment instruments available to French banks, including SEPA instruments. Therefore it can handle a wide range of payment instruments including cards (POS and ATM transactions), credit transfers, direct debits, cheques, bills of exchange, bank drafts and non-financial messages.

The volume of card transactions represents more than 45% of the transactions processed by the CORE system. Cheques still represent a significant although decreasing share of payments in France and the processing of French cheques by CORE relies on the cheque imaging technologies following national exchange rules.

3.3.1.4 *Operation of the system and settlement procedures*

CORE offers a centralised IT architecture and the system is based on:

- modern middleware components, with established track record;
- systematic redundancy of all critical hardware and middleware components; and
- high capacity of transaction handling.

For contingency purposes it has:

- two data centres, with real-time replication of data, which enables a short synchronisation phase and a fast switch, should one of them be in default;
- two mirrored servers hosting tools in different locations that can be accessed by support staff through encrypted links;
- a separate location for STET service support staff in case of problems at the main data centre location; and
- tools to guarantee permanent and efficient client access, ie the STET encrypted network, SWIFT Net, and the STET secured extranet.

Direct participants can enter payment orders into the system on their own behalf or on behalf of their indirect participants at any time during working hours (00:00–22:10) and receive a time-stamped confirmation of entry. The system is in charge of all the automated processing required for receiving and sending operations and netting interbank payment orders exchanged between participants in euros. Participants can monitor the status of their debit and credit payments.

Every business day, CORE starts and closes a new payment cycle, which works in three steps. In the first step the system starts the exchange of payment orders between banks' IT centres and CORE's technical platform. The processing of operations in the system is organised around a central platform, to which direct participants connect via the system's dedicated servers. The second step includes the multilateral netting of orders in CORE between 14:00 and 15:00, and the third step is the settlement of net balances on settlement accounts held by the direct participants in TARGET2 at 15:05.

3.3.1.5 Risk management

By design, CORE is a deferred net settlement system with a single daily settlement, which implies that large exposures can build up until the end-of-day settlement. Payment finality of all the individual underlying payment instruments exchanged in the system is only reached when settlement of the net interbank obligations has occurred in central bank money, between the direct participants, in the RTGS system TARGET2. On particular days, single net debit positions for a participant can reach more than EUR 5 billion. Therefore, to manage the different risks, mitigation actions are implemented:

- legal protection through the status of notified system under the Settlement Finality Directive;
- financial rating for participants to access and continue participating in the system;
- recommendations to avoid risk concentration; and
- a Financial Safety Mechanism with a collective pool of cash collateral and individual prepayments, combining “survivors pay” and “defaulter pays” features.

3.3.1.6 Pricing

The pricing of the system is applied to direct participants. It combines fixed fees to participate (setup fees mostly) and variable fees depending on the volume/value of operations. The pricing policy was designed so as to balance the needs of the large participants with those of smaller participants. Pricing is supposed to achieve a cost recovery (investments + variable costs) objective.

3.3.1.7 Major ongoing and future projects

The system has not undergone any major changes since it started operations.

4. Systems for post-trade processing, clearing and securities settlement

4.1 General overview

Securities settlement in France is handled by Euroclear France. On 26 November 2007, ESES replaced RGV2 as Euroclear France’s securities settlement system. ESES France delivers prompt irrevocable gross settlement and simultaneous settlement of securities and funds transfers in central bank money.

CCP clearing in France is handled by LCH.Clearnet SA. A recent evolution was the launch on 29 March 2010 of a clearing solution on European indices on CDS, a segment for which the need for development of a clearing solution had been identified both at the G20 and at the ESCB level.

4.2 Post-trade processing systems

Not applicable.

4.3 Central counterparties and clearing systems

For a detailed description of the activity of LCH.Clearnet SA, please refer to the descriptive Red Book chapter on the euro area.

4.4 Securities settlement systems

For a detailed description of the activity of ESES France, please refer to the descriptive Red Book chapter on the euro area.

4.5 The use of the securities infrastructure by the Bank of France

4.5.1 The Bank of France as liquidity provider in the SSS

ESES France offers a DVP solution corresponding to “Model 1”, ie it ensures real-time gross settlement of securities (through mirror securities account) and cash (through central bank cash accounts) thus ensuring immediate settlement finality.

There is a real-time link with the TARGET2 payment system, which allows the participants to transfer liquidity between ESES and TARGET2 depending on their needs in each platform. The system offers an auto-collateralisation functionality, which implies the automatic setting-up of intraday credit in central bank money in order to ensure the smooth processing of transactions settlement. In other words, if, at some point, a participant does not have sufficient funds to settle a securities purchase but has on its securities account assets eligible as collateral with the central bank, the ESES platform can automatically deliver these eligible assets to the central bank in exchange for intraday credit. This credit will then enable the finalisation of the securities purchase.

The ESES platform ensures the settlement of the securities transactions’ cash legs in central bank money, according to a so-called integrated model whereby the cash flows relating to securities transactions are settled on the same platform as the securities. These cash flows are registered, under central bank mandate, on accounts opened directly on the settlement platform.

4.5.2 Monetary policy operations: marginal lending under the new 3G scheme

The 3G (Gestion globale des garanties) project went live on 18 February 2008 and provided the French banking community with a tool to manage all ESCB-eligible collateral including credit claims in a single pool of collateral. To obtain overnight liquidity from the Bank of France against this pool of collateral, institutions must fulfil the eligibility criteria to participate in monetary operations and must also hold an RTGS account at the Bank of France to input their marginal lending operations.

Marginal lending requests must be transmitted to the Bank of France before 18:15. If a participant has a debit balance on its RTGS account after a marginal lending facility request, automatic marginal lending will occur. RTGS accounts must always have a positive credit balance at the end of the day. The Bank of France is solely responsible for checking that the counterparty pool of collateral can cover the lending before confirming the operation.

Repayment of marginal lending occurs at the opening of the day at 07:00. The SSP inputs a connected payment unwinding the previous operation. Interest payment occurs on a separate account.

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

Contents

List of abbreviations	163
Introduction – main recent developments.....	165
Large-value payment systems	165
Retail payment systems.....	165
Securities trading, clearing and settlement.....	165
1. Institutional aspects	166
1.1 The general institutional framework	166
1.1.1 Legal requirements.....	166
1.1.2 Rules governing payment services	167
1.2 The role of the Deutsche Bundesbank.....	167
1.2.1 Cooperative nature of payment systems policy.....	168
1.2.2 Oversight function regarding payment and securities settlement systems	169
1.2.3 Payment systems of the Bundesbank.....	169
1.2.4 Settlement and account services	171
1.2.5 Pricing policy	171
1.2.6 General Terms and Conditions	171
1.3 The role of other private and public sector bodies.....	172
2. Payment media used by non-banks.....	172
2.1 Cash payments.....	172
2.2 Non-cash payments.....	173
2.2.1 Non-cash payment instruments	173
2.2.2 Non-cash payment terminals	179
3. Payment systems (funds transfer systems).....	180
3.1 General overview.....	180
3.2 Large-value payment systems	180
3.2.1 TARGET2.....	180
3.3 Retail payment systems.....	181
3.3.1 Retail Payment System (RPS).....	181
4. Systems for clearing and securities settlement	184
4.1 General overview.....	184
4.2 Clearing systems	188
4.2.1 Eurex Clearing AG.....	188
4.2.2 European Commodity Clearing AG (ECC)	191

4.3	Securities settlement systems (SSS)	193
4.3.1	Clearstream	193
4.3.2	Use of Clearstream by the Bundesbank.....	198

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.

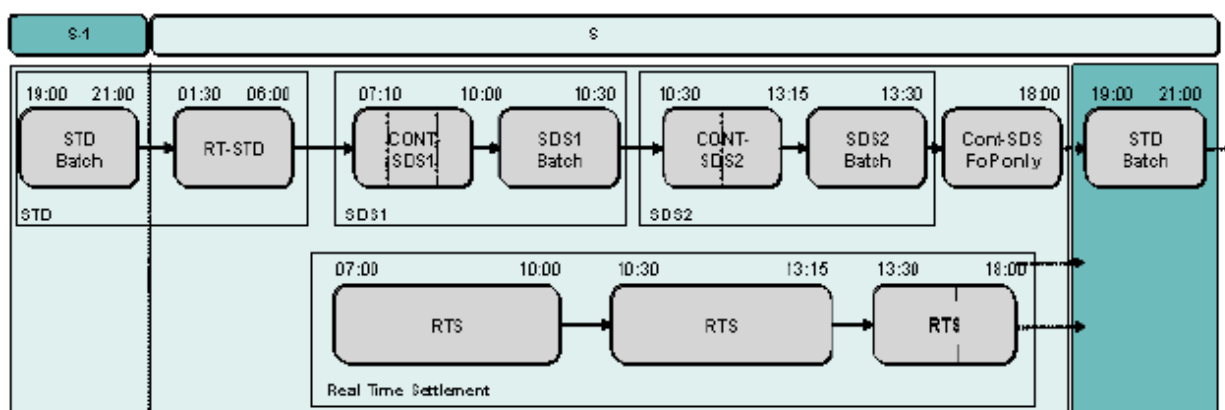
4.3.1.4 *Settlement process*

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.

**Payment, clearing and
settlement systems in
Hong Kong SAR**

Contents

List of abbreviations	203
1. Introduction.....	205
1.1 The general institutional framework	205
1.1.1 Payment systems and instruments	205
1.1.2 Securities settlement	206
1.2 The role of the HKMA	206
1.2.1 Oversight.....	207
1.2.2 Provision of services.....	208
1.2.3 Cooperative oversight arrangements	208
1.3 The role of other private and public sector bodies.....	208
1.3.1 Providers of payment services.....	208
1.3.2 Licensing and registration requirements for related securities service providers	211
1.3.3 Other service providers.....	211
1.3.4 Role of other private and public sector bodies	212
2. Payment methods.....	213
2.1 Cash payments.....	213
2.2 Non-cash payments.....	213
2.2.1 Non-cash payment instruments	213
2.2.2 Non-cash payment terminals	215
3. Payment systems	215
3.1 General overview.....	215
3.2 Large-value payment systems	215
3.2.1 The real-time gross settlement (RTGS) system for HKD.....	215
3.2.2 Real-time gross settlement (RTGS) systems for USD, EUR and RMB ...	220
3.3 Payment links	223
3.3.1 Cross-border PVP links	224
3.3.2 Payment links with the Mainland.....	224
3.3.3 Payment links with Macau	225
4. Systems for post-trade processing, clearing and securities settlement	225
4.1 General overview.....	225
4.2 Post-trade processing systems	225
4.2.1 Trade repository	225
4.3 Central counterparties and clearing systems	225
4.4 Securities settlement systems	226

4.4.1 Central Moneymarkets Unit	226
4.4.2 CCASS	229

List of abbreviations

AI	Authorised Institution
AMS	Automatic matching system
ATM	Automatic teller machine
CB	Clearing Bank
CCASS	Central Clearing and Settlement System
CCPMP	Cross-Currency Payment Matching Processor
CHATS	Clearing House Automated Transfer System
CLS	Continuous linked settlement
CMT	CMU User Terminal
CMU	Central Moneymarkets Unit
CMUP	Central Moneymarkets Unit Processor
CNS	Continuous net settlement
CSD	Central Securities Depository
CSSO	Clearing and Settlement Systems Ordinance
DTCs	Deposit-Taking Company
DTCA	DTC Association
DVP	Delivery versus payment
EFBNs	Exchange Fund Bills and Notes
EPS	Easy Pay System
FOP	Free-of-payment
GEM	Growth Enterprise Market
HKAB	Hong Kong Association of Banks
HKEx	Hong Kong Exchanges and Clearing Limited
HKFE	Hong Kong Futures Exchange
HKICL	Hong Kong Interbank Clearing Limited
HKMA	Hong Kong Monetary Authority
HKSCC	Hong Kong Securities Clearing Company Limited
IFTP	Interbank Fund Transfer Processor
LBs	Licensed Banks
MMs	Market-makers
MPC	Multipurpose stored-value card
OCL	Octopus Cards Limited
OTC	Over-the-counter
POS	Point-of-sale
PPS	Payment-by-phone service

PVP	Payment versus payment
RDs	Recognised Dealers
RLBs	Restricted Licence Banks
RTGS	Real-time gross settlement
SAP	Settlement Account Processor
SEHK	Stock Exchange of Hong Kong
SFC	Securities and Futures Commission
SI	Settlement Institution

1. Introduction

Designed to expedite economic transactions and financial intermediation in the region, Hong Kong SAR's financial infrastructure features a number of enhancements that smooth payment flows and allow banks to use liquidity more efficiently. The efficiency of these payment and settlement systems helps to consolidate Hong Kong's position as an international financial centre and a settlement hub of the region.

Hong Kong's financial infrastructure can be categorised into three components: payment systems for the settlement of interbank payments; debt securities settlement systems for the settlement and custody of debt securities; and system links to provide payment-versus-payment and delivery-versus-payment services, as well as external links to facilitate cross-border transactions.

1.1 The general institutional framework

Specific legal and regulatory requirements provide for the oversight of important payment systems in Hong Kong. Moreover, a number of laws have a direct bearing on various payment instruments and institutions. The relevant ordinances and regulations are set out in the following sections.

1.1.1 *Payment systems and instruments*

Oversight of designated systems

The *Clearing and Settlement Systems Ordinance (CSSO)*, which came into force in November 2004, empowers the Hong Kong Monetary Authority (HKMA) to designate and oversee clearing and settlement systems that are material to the monetary or financial stability of Hong Kong, or to the functioning of Hong Kong as an international financial centre. The purpose of the CSSO is to promote the general safety and efficiency of the designated systems. The CSSO also provides statutory backing for the finality of settlement for transactions made through systems designated under the Ordinance by protecting the finality of settlement from insolvency laws or other legislation.

Informal oversight of retail payment systems

Unlike large-value interbank payment systems, retail payment systems, which handle large volumes of relatively low-value transactions, generally pose few, if any, systemic risks. The HKMA therefore considers that retail payment systems are in general not systemically significant enough to be designated under the CSSO. However, the HKMA encourages the retail payment industry to adopt a self-regulatory approach by issuing codes of practice to promote the system's safety and efficiency. The *Code of Practice for Multi-purpose Stored Value Card Operation*, which came into effect in August 2005, sets out the principles covering operational reliability, data security, and the efficiency and transparency of multipurpose stored-value card (MPC) issuers, system operators and merchant acquirers in Hong Kong. The *Code of Practice for Payment Card Scheme Operators*, which came into effect in January 2007, sets out principles covering operational reliability, data and network security, and the efficiency and transparency of credit and debit card operations of card scheme operators in Hong Kong. The HKMA monitors the industry's compliance with the two codes of practice.

Other relevant ordinances and regulations

Section 3A(1) of the *Exchange Fund Ordinance* provides that the Financial Secretary may require authorised institutions (see Section 1.2.1.1) to open a settlement account with the HKMA and to operate it on such terms and conditions as the Financial Secretary considers appropriate. The Financial Secretary delegates this power to the Monetary Authority.

The *Legal Tender Notes Issue Ordinance* regulates the issue of banknotes and currency notes. Under the ordinance, the banknotes issued by the Bank of China (Hong Kong) Limited, the Standard Chartered Bank (Hong Kong) and The Hongkong and Shanghai Banking Corporation are legal tender within Hong Kong.

The legal definition of a cheque is stipulated in the *Bills of Exchange Ordinance*. According to Section 73(1) of the Ordinance, a cheque is a bill of exchange, drawn on a banker, that is payable on demand.

The *Banking Ordinance* provides the HKMA with the power to regulate the issue of MPCs in Hong Kong. The regulatory regime aims to ensure the soundness of MPC schemes and their issuers. The Ordinance provides that licensed banks are deemed to be approved to issue or facilitate the issuing of MPCs, but that other entities that plan to issue MPCs must first apply for authorisation as a deposit-taking company (DTC).

In developing this regulatory framework, the HKMA seeks to strike a balance between the need to maintain the stability of the payment system and the desirability of not stifling developments which would promote competition and innovation in Hong Kong's MPC sector.

1.1.2 Securities settlement

The Securities and Futures Commission (SFC) administers Hong Kong's securities and futures legislation.

The SFC has oversight responsibility for Hong Kong Exchanges and Clearing Limited (HKEx) and its subsidiaries, namely the Stock Exchange of Hong Kong (SEHK), the Hong Kong Futures Exchange (HKFE) and their clearing houses. It also has regulatory responsibility for takeovers and mergers activity, offers of investment products, and the enforcement of laws on market malpractice. Since March 2000, the SFC has been responsible for the regulation of all participants in the two exchanges. As for listed companies, SEHK is the regulator for all companies listed on the Main Board and the Growth Enterprise Market (GEM), except the HKEx, which is regulated by the SFC.

In February 2001, the SFC signed a memorandum of understanding with the HKEx. The memorandum covers the supervision of exchange participants, market surveillance and oversight of the activities of the HKEx, the two exchanges and clearing houses, including their rule-making powers. A separate memorandum of understanding covers listing matters.

Among its other regulatory responsibilities in relation to the HKEx, the SFC's Enforcement Division monitors trading on the two exchanges with a view to detecting and understanding unusual price and volume movements, and conducts investigations if necessary; the Intermediaries Supervision Department (ISD) conducts routine inspection visits of exchange participants (as well as other intermediaries who are not exchange participants) to ensure that intermediaries comply with regulatory requirements; ISD also conducts annual reviews of the operations of the depository and nominee services provided by Hong Kong Securities Clearing Company Limited (a subsidiary of HKEx). For its part, the Supervision of Markets Division oversees the operations of the HKEx and its subsidiaries to ensure the sound functioning of their trading, settlement and operational systems.

1.2 The role of the HKMA

The HKMA is the government authority in Hong Kong responsible for maintaining monetary and banking stability, including the maintenance and development of Hong Kong's financial infrastructure. The HKMA also performs its role under the CSSO as an overseer of the important clearing and settlement systems with the aim of promoting their safety and efficiency. The CSSO also provides statutory backing for settlement finality in transactions made through systems designated under the CSSO by protecting settlement finality from insolvency laws or any other legislation.

The HKMA was established on 1 April 1993 when the Office of the Exchange Fund merged with the Office of the Commissioner of Banking. Its main functions and responsibilities are governed by the Exchange Fund Ordinance and the Banking Ordinance, and it reports to the Financial Secretary.

The HKMA plays an active role in the development of financial infrastructure in Hong Kong with a view to maintaining Hong Kong as an international financial centre and developing Hong Kong into a settlement hub in the Asian region.

1.2.1 Oversight

The HKMA is the government authority in Hong Kong responsible for maintaining monetary and banking stability. The HKMA's main functions and policy objectives are to:¹

- maintain currency stability within the framework of the Linked Exchange Rate System;
- promote the stability and integrity of the financial system, including the banking system;
- help to preserve Hong Kong's status as an international financial centre by, for example, developing and maintaining Hong Kong's financial infrastructure; and
- manage the Exchange Fund.

Unlike many other central banks, the HKMA does not carry out the following functions:

- banknote issuance. Hong Kong's HKD 20, 50, 100, 500 and 1,000 notes are currently issued by three commercial banks. These are The Hongkong and Shanghai Banking Corporation, the Standard Chartered Bank and the Bank of China (Hong Kong). The HKMA issues only HKD 10 notes on behalf of the government.
- banker to the government. Although the bulk of the fiscal reserves are held by the Exchange Fund, which is managed by the HKMA, the HKMA does not act as the banker to the government, a function which has been carried out historically by commercial banks.

The CSSO empowers the HKMA to designate and oversee clearing and settlement systems that are material to the monetary or financial stability of Hong Kong, or to the functioning of Hong Kong as an international financial centre. Currently six systems are designated under the CSSO, namely, the Central Moneymarkets Unit (CMU) (a clearing and settlement system for debt securities), HKD Clearing House Automated Transfer System (CHATS), USD CHATS, EURO CHATS, RMB CHATS (the RTGS systems), and the Continuous Linked Settlement (CLS) System. The first five are local designated systems. Except for the CLS System, the HKMA oversees the designated systems through off-site reviews, continuous monitoring, on-site examinations and meetings with management of the system operators and settlement institutions of the systems.

As mentioned above, the HKMA encourages the retail payment industry to adopt a self-regulatory approach by issuing codes of practice to promote safety and efficiency. The HKMA is responsible for monitoring the compliance of Octopus Cards Limited (OCL) with the Code of Practice for Multi-purpose Stored Value Card Operation. OCL is required to submit to the HKMA an annual self-assessment report. The HKMA also monitors the compliance of the credit and debit card scheme operators in Hong Kong with the Code of Practice for Payment Card Scheme Operators. The card scheme operators are required to submit to the

¹ These functions and objectives are generally common to central banks around the world.

HKMA an annual self-assessment report and report to the HKMA any incident which could materially affect cardholders in Hong Kong.

1.2.2 Provision of services

All Licenced Banks (LBs) in Hong Kong are required to maintain a settlement account with the HKMA. As stipulated in Section 3A(1) of the Exchange Fund Ordinance, the Financial Secretary may require an authorised institution to open a settlement account with the Monetary Authority for the account of the Exchange Fund. The account must be maintained and operated on the terms and conditions considered appropriate by the Financial Secretary. The Financial Secretary has delegated this power to the Monetary Authority.

In May 2000, the HKMA announced that Restricted Licence Banks (RLBs) in Hong Kong could also access the HKD CHATS, provided that they can demonstrate a business need to do so.

The operator of all RTGS systems in Hong Kong is Hong Kong Interbank Clearing Limited (HKICL), a company jointly owned by the HKMA and the Hong Kong Association of Banks (HKAB).

The Central Moneymarkets Unit (CMU) is a business unit of the HKMA specialising in the clearing and settlement of debt securities. The HKMA plays no part in the settlement of equity securities (see Section 4).

1.2.3 Cooperative oversight arrangements

For the CLS System, which is a designated system in Hong Kong but primarily regulated by its home supervisor, the US Federal Reserve, the HKMA participates in the international cooperative oversight of the CLS System with the US Federal Reserve and other central banks through the CLS Oversight Committee.

SWIFT, a major global message carrier for payment systems, is subject to cooperative oversight by central banks, with the National Bank of Belgium being the lead overseer since the carrier is incorporated in Belgium. Since all the local designated systems have been migrated to the SWIFTNet platform in July 2010, the HKMA has an interest in the oversight of SWIFT and participates in discussions with the National Bank of Belgium and other central banks on relevant oversight matters.

The HKMA also cooperates with other central banks in the oversight of PVP links between payment and settlement systems in Hong Kong and those in other jurisdictions, including the US dollar/Indonesian rupiah PVP link between the USD CHATS and Bank of Indonesia's RTGS system and the US dollar/Malaysian ringgit PVP link between the USD CHATS and the Malaysian RTGS system. The oversight of all interbank payment systems, including the CMU, is performed by the HKMA.

1.3 The role of other private and public sector bodies

1.3.1 Providers of payment services

1.3.1.1 Banks

Hong Kong maintains a three-tier system of deposit-taking institutions, namely, licensed banks, restricted licence banks and deposit-taking companies. They are collectively known as "Authorized Institutions" (AIs) under the Banking Ordinance.

Under the Banking Ordinance, the HKMA is the authority responsible for the authorisation, suspension and revocation of all three types of AI status. Checks and balances are provided in the Banking Ordinance with the requirement that the HKMA consults the Financial

Secretary on important authorisation decisions, such as suspension or revocation. The Chief Executive-in-Council is the appellate body for hearing appeals against decisions made by the HKMA.

Only LBs may operate current and savings accounts, accept deposits of any size and maturity from the public, and pay or collect cheques drawn by or paid in by customers. LBs are required to open and maintain an account with the HKMA for the settlement of HK dollars. In other words, they have direct access to the HKD CHATS. Therefore LBs are the major providers of payment services in Hong Kong.

RLBs principally engage in merchant banking and capital market activities. They may take call, notice or time deposits of any maturity of HKD 500,000 and above. Since May 2000, RLBs with a clear business need have been permitted to open settlement accounts with the HKMA and to join the HKD CHATS for the settlement of HK dollars. However, they are not allowed to participate in the clearing of cheques as they are not allowed to operate current accounts for customers.

Deposit-taking companies (DTCs) are mostly owned by, or associated with, banks. They engage in a range of specialised activities, including consumer finance and securities business. These companies may take deposits of HKD 100,000 or above with an original term to maturity, or call or notice period, of at least three months. DTCs do not have direct access to the HKD CHATS.

Hong Kong has one of the highest concentrations of banking institutions in the world. Seventy of the 100 largest banks in the world have operations in Hong Kong. At the end of December 2010, there were 146 LBs, 21 RLBs and 26 DTCs. In addition, there were 67 local representative offices of overseas banks in Hong Kong. A local representative office is not allowed to engage in any banking business. Its role is confined mainly to liaison work between the bank and its customers in Hong Kong.

Als must comply with the provisions of the Banking Ordinance, which, among other things, requires them to maintain adequate liquidity and capital adequacy ratios, submit periodic returns to the HKMA, adhere to limits on loans to any one customer or to directors and employees, and seek approval for the appointment of controllers, directors and senior management.

1.3.1.2 Hong Kong Interbank Clearing Limited (HKICL)

HKICL is a private company jointly owned by the HKMA and HKAB, the latter being a private organisation representing the banking industry that all banks in Hong Kong must join as members. HKICL was established in May 1995 to take over the HK dollar clearing functions provided by the former Management Bank of the Clearing House, The Hongkong and Shanghai Banking Corporation (HSBC). The principal activity of HKICL is the provision of interbank clearing and settlement services to banks in Hong Kong. In other words, HKICL is the system operator for the HKD CHATS.

HKICL is also the system operator for the foreign currency payment systems (including US dollar, euro and renminbi), and is responsible for the development and operation of these clearing systems in Hong Kong.

Apart from payment systems, HKICL also operates the computer system of the CMU, a central clearing and settlement system for public and private debt securities, on behalf of the HKMA.

1.3.1.3 Hong Kong Securities Clearing Company Limited (HKSCC)

HKSCC was incorporated in May 1989. Pursuant to the Exchanges and Clearing Houses (Merger) Ordinance, HKSCC was converted from a company limited by guarantee to a company limited by shares and its constitution was amended accordingly. Following an

allotment of shares prescribed by the Ordinance, HKSCC became a wholly owned subsidiary of the HKEx in 2000.

HKSCC created the Central Clearing and Settlement System (CCASS) in 1992, and became the central counterparty that provides its participants with book-entry settlement for securities, either free of, or against, payment.

Only securities listed or traded on the exchange are accepted for settlement in CCASS and only brokers, clearing agencies, custodians, stock lenders and stock pledgees based in Hong Kong or such other persons as HKSCC may determine can be accepted as participants. HKSCC may accept other categories of securities, whether or not listed on the Exchange, as eligible securities and may admit other categories of participants. HKSCC also offers a nominee service.

Building upon the capability of the RTGS systems in Hong Kong, the HKMA has extended the delivery versus payment (DVP) facility for debt securities transactions to shares transactions. A link between HKICL and CCASS was set up in May 1998 to provide a DVP facility for shares denominated in HK dollars in order to reduce settlement risks and improve settlement efficiency. Following the implementation of US dollar and renminbi clearing systems in Hong Kong, the DVP facility was extended to shares transactions denominated in US dollars in August 2000 and in renminbi in October 2010 respectively.

1.3.1.4 Central Moneymarkets Unit (CMU)

Established in 1990, the CMU is operated by the HKMA to provide computerised clearing and settlement facilities for Exchange Fund Bills and Notes (EFBNs). In December 1993, the HKMA extended the service to other HK dollar-denominated debt securities.

Starting in December 1994, the CMU has established one-way links to international central securities depositories such as Euroclear and Clearstream. This helps to promote Hong Kong's domestic debt securities to overseas investors, who can use these links to participate in Hong Kong's debt market. The CMU has also set up a network of bilateral linkages with other central securities depositories (CSDs) in the Asia-Pacific region, including Australia (December 1997), New Zealand (April 1998), South Korea (September 1999) and Mainland China (April 2004), to facilitate cross border clearing and settlement of debt securities in the region.

To provide a one-stop shop service to enable CMU members to hold equity securities in their CMU accounts, CMU has become a custodian participant in the CCASS System operated by the HKSCC in June 2010. This provides additional convenience to CMU members especially in handling equities derived from the conversion of convertibles lodged with CMU.

In December 1996, a seamless interface between the CMU and the HKD CHATS was established. This enabled the CMU to provide for its members real-time and end-of-day DVP services in HK dollar-denominated securities. Through this interface, banks in the HKD CHATS are able to obtain HKD liquidity from the HKMA to facilitate payment flows through intraday and overnight repo of EFBNs.

Following the implementation of the foreign currency RTGS systems (ie the USD CHATS, Euro CHATS and RMB CHATS) in Hong Kong, the CMU system established a seamless interface with the RTGS systems for the US dollar, euro and renminbi in December 2000, April 2003 and February 2007 respectively. With these system interfaces in place, the CMU provides its members with real-time and end-of-day DVP settlement of US dollar-, euro- and renminbi-denominated debt securities. Furthermore, these interfaces enable automatic intraday repos, as a means of providing intraday liquidity to the participants of these RTGS systems.

All debt instruments cleared through the CMU are either immobilised or dematerialised, and transfer of title is effected in computer book-entry form.

Besides debt securities, CMU has extended its service to investment funds. Launched in August 2009, the CMU Fund Order Routing and Settlement Service provides CMU Members who are investment fund distributors, custodians, managers and institutional investors in Hong Kong and in the region with a standardised platform for processing investment fund transactions. The service was designed to make fund order-routing and settlement safer and more efficient by streamlining the processing of investment fund transactions among market participants.

1.3.2 Licensing and registration requirements for related securities service providers

Corporations carrying on regulated activities² must be licensed or registered under the Securities and Futures Ordinance (SFO). There are two types of legal entities which may be licensed by or registered with the SFC to carry on business in a regulated activity, namely:

- (i) a corporation licensed by the SFC for the regulated activity (ie, a Licensed Corporation); and
- (ii) a bank (or authorised financial institution) registered with the SFC for the regulated activity (ie, a Registered Institution).

Applications by corporations for a licence or registration, or by individuals for a licence or for approval or consent to act as a Responsible Officer or an Executive Officer, must be refused unless applicants satisfy the SFC or the HKMA that they are “fit and proper”.³

1.3.3 Other service providers

1.3.3.1 Credit/charge card operators

Visa and MasterCard are the two largest credit card operators in Hong Kong. They provide the international network linkages through which the merchants, merchant acquirers and card issuers are connected. China UnionPay (UnionPay) set up its credit card business in Hong Kong in 2004 and its operations have been growing since then. American Express and Diners Club International operate their charge card business mainly on a standalone or vertically integrated basis. That is, they perform the multiple roles of network provider, card issuer and merchant acquirer themselves. JCB International (JCB) issues cards and acquires merchants on its own. It also receives membership royalty fees from other institutions for the issuance of JCB cards in Hong Kong.

² Nine types of regulated activities are listed in Schedule 5 to the SFO:

- Type 1: Dealing in securities
- Type 2: Dealing in futures contracts
- Type 3: Leveraged foreign exchange trading
- Type 4: Advising on securities
- Type 5: Advising on futures contracts
- Type 6: Advising on corporate finance
- Type 7: Providing automated trading services
- Type 8: Securities margin financing
- Type 9: Asset management

³ Each Licensed Corporation or Registered Institution must have at least two individuals who are responsible for each regulated activity for which it is licensed or registered. These individuals are known as “Responsible Officers” for Licensed Corporations and “Executive Officers” for Registered Institutions.

1.3.3.2 Other network operators

Electronic Payment Services Company (Hong Kong) Ltd (EPSCO)

EPSCO is the network provider of POS debit card services (Easy Pay System, or EPS), and it offers non-POS debit facilities including the Payment by Phone Service (PPS) and bill payment services.

Founded in 1984, EPSCO is currently a consortium of 21 major banks in Hong Kong. Member banks do not issue separate cards for the payment services because the functions are typically included in bank ATM cards and credit cards with ATM functions. EPSCO provides services to all merchant applicants on a uniform basis regardless of their size, location and business volume. It provides the terminals free of charge and does not impose a minimum service charge on participating retailers. At present, EPS is accepted at more than 25,000 locations in Hong Kong, Macau and Shenzhen.

Joint Electronic Teller Services Limited (JETCO)

JETCO was established in 1982 by a small group of five banks to operate an interbank ATM network. Today, JETCO has extended its services to more than 30 member banks in Hong Kong and Macau. Customers can access their accounts through JETCO's network of around 1,600 ATMs in Hong Kong. Besides ATM services, JETCO customers can make purchases through POS terminals at designated retail outlets in Macau that display the JETCO logo. In addition, JETCO also provides electronic non-POS debit instruction services.

Octopus Card Limited (OCL)

OCL, formerly known as Creative Star Limited, issues the Octopus Card. This contactless MPC is used primarily to pay fares on public transport services run by the five transport operators that jointly own OCL (see Section 2.5.3).

1.3.4 Role of other private and public sector bodies

1.3.4.1 The Hong Kong Association of Banks (HKAB)

The HKAB is a statutory body established in 1981 under the Hong Kong Association of Banks Ordinance to replace the Hong Kong Exchange Banks Association. All LBs are required to be members of the HKAB and to observe the rules set by the Association under the Ordinance.

The main objectives of the HKAB are to promote the interests of LBs, to draw up rules for the conduct of the business of banking, to act as an advisory body to its members in matters concerning the business of banking, and to provide facilities for the clearing of cheques and other instruments.

1.3.4.2 DTC Association (DTCA)

Established in 1981 under the Companies Ordinance, the DTCA was originally known as the Hong Kong Association of Restricted Licence Banks and Deposit-Taking Companies. Any RLB or DTC may join the DTCA.

The objectives of the DTCA include promoting the general interests of RLBs and DTCs, serving as an intermediary between its members and the government, and acting as a consultative body to the government on matters concerning deposits in Hong Kong.

2. Payment methods

2.1 Cash payments

Cash is still by far the most popular way of making a retail payment in Hong Kong. At the end of 2009, HK dollar notes and coins in circulation amounted to HKD 208 billion, representing 12.8% of GDP. Despite the significant growth of card-based or electronic means of retail payment in the past decade, cash usage in Hong Kong is still high.

The denominations of notes in circulation in Hong Kong are HKD 10, HKD 20, HKD 50, HKD 100, HKD 500 and HKD 1,000. The government, through the HKMA, has authorised three commercial banks to issue banknotes in Hong Kong: these are The Hongkong and Shanghai Banking Corporation, the Standard Chartered Bank (Hong Kong) and the Bank of China (Hong Kong). In addition, the government issues HKD10 notes via the HKMA. Whether issued by the three note-issuing banks or directly by the government, HKD10 notes are issued or redeemed in US dollars against payment to or from the government's Exchange Fund at a specified rate of USD 1 to HKD 7.80 under the linked exchange rate system. The US dollar backing for issued notes is deposited with the Exchange Fund in exchange for certificates of indebtedness, which can be exchanged for banknotes.

2.2 Non-cash payments

2.2.1 Non-cash payment instruments

2.2.1.1 Credit transfers

The majority of credit transfers are standing orders whereby a payer instructs their bank to debit their account and transfer a set amount to the payee on a regular specific date, usually monthly. Payroll crediting is the most common form of direct credit transfer.

After individual instructions are processed together with the bulk credit instructions for that day, the net obligations between banks are settled in the RTGS interbank payment system. More than 10 million credit transfers were processed by HKICL in 2010 for a total value of about HKD 296 billion.

2.2.1.2 Direct debits

Standing direct debit instructions are commonly used by households for regular payments such as utility bills and charges. In debit transfers, the payee instructs his bank to collect payment for the paying party, often on a recurring basis. Direct debit payments are pre-authorised by the paying customer, who authorises the bank to debit his or her account on receipt of instructions initiated by the specified payee.

Similar to direct credit transfers, individual debit instructions are processed in bulk clearing by HKICL for that day and the net obligations between banks are settled in the RTGS interbank payment system. More than 38 million debit transfers were processed by HKICL in 2010 for a total value of about HKD 87 billion.

2.2.1.3 Cheques

Corporations and individuals in Hong Kong often use cheques as a payment method. As a retail payment method, cheques are also often used in transactions where debit cards or credit cards are not accepted (eg in payments for large-value items such as motor cars or deposits when purchasing property). Cheques are also used for some smaller-value items such as payment of utility bills, but alternative electronic means of payment have become increasingly popular.

The cheque clearing system in Hong Kong is operated by HKICL and overseen by the HKMA. Interbank money settlement of cheques in net terms takes place between 14:15 and 14:45 on the business day following the deposit of a cheque. The cheque clearing system has an interface with the settlement accounts maintained by the banks with the HKMA. On average, about half a million cheques are cleared every day amounting in value to some HKD 31 billion on average in 2010. This is about 4% of the daily amount handled by the HKD CHATS.

As from January 1998, it has been possible for HKD cheques issued by banks in Hong Kong to be presented at banks in the Shenzhen Special Economic Zone and delivered back to Hong Kong for clearing. Good funds can be made available to the payee in Shenzhen in the afternoon of the next business day after presentation of the cheque. A similar service was extended to 19 cities in Guangdong Province in October 2000. However, the cleared value of such cross-border cheques is minuscule compared with that of the daily cheque processing in Hong Kong.

2.2.1.4 *Payment cards*

(i) *Credit cards*

The use of credit cards has become increasingly popular in recent years. According to the HKMA's survey and quarterly statistics on major card operators, the total number of credit cards in circulation was 15.2 million and there were over 13 million credit card accounts involving outstanding receivables of more than HKD 78 billion in the third quarter of 2010. The credit cards used in Hong Kong include Visa, MasterCard, CUP, American Express, Diners and JCB International (JCB).

Credit card payment involves credit provision by the card issuers to the cardholders. In a credit card transaction, the card issuer pays for the goods and services on behalf of the consumer, after charging the retailer a merchant discount fee. If cardholders settle their accounts within the payment grace period offered by the card issuers (usually at least 30 days), the provision of credit is interest-free. This buy-now-pay-later benefit is strikingly different from other means of retail payment, and explains why credit cards have become so popular in Hong Kong.

In 2008, Visa launched its Visa payWave card, which is based on a contactless payment technology. Customers can make payment by holding their Visa payWave-enabled card close to a contactless reader, thus speeding up transactions by removing the need to physically swipe or insert the card into a payment reader. In Hong Kong, cardholders can pay for transactions of up to HKD 500 without the need for signature verification.

(ii) *Debit cards*

Debit cards in Hong Kong may be used in the EPS or JETCO platform. When a debit card is used in the EPS platform, EPS links up consumers and merchants via banks' electronic systems. Payments can be made with an ATM card at any outlet that displays the EPS logo. An EPS transaction involves the direct transfer of funds from the purchaser's bank account to that of the retailer, which is effected at the POS using a bank ATM card or a credit card with an ATM function. It is, in principle, equivalent to payment by means of a credit transfer, except that the account of the payer is debited immediately via the POS but the account of the payee is credited by a batch run at the end of the same day or early the next day.

(iii) *Other cards – multipurpose stored-value cards*

Multipurpose stored-value cards are one of the most popular modes of retail payment in Hong Kong after experiencing rapid growth in the past few years. Unlike credit cards and debit cards, the operation of an MPC involves the prepayment of funds by the cardholders to the card issuers. The total value of these prepayments effectively constitutes a float. As the

question of float management is of prudential concern to both the HKMA and the public, this is one of the considerations that led to the authorisation of OCL as a DTC (see below), thus bringing it under the HKMA's regulatory regime.

Octopus Card is a contactless MPC issued by OCL. The card scheme was first launched in the third quarter of 1997, initially as a means of paying public transport fares.

In April 2000, OCL, formerly known as Creative Star Limited, was authorised as a special purpose DTC under the Banking Ordinance. The authorisation allows the Octopus Card to be used more widely, thus enhancing its convenience for cardholders. Its non-transport-related applications now include car parking fees, fast food outlets, bakeries, convenience stores, supermarkets, personal care stores, vending machines, photo booths, pay phones, photocopiers, cinemas and schools. Any extension of the multipurpose use of Octopus by non-transport service providers is subject to the conditions set down by the HKMA when it authorised the company as a DTC.

More than 20 million Octopus Cards were in circulation by the end of 2010, generating over 11 million transactions per day. Octopus Card is also accepted at more than 20 outlets in the Shenzhen region of Mainland China. Payments made in these outlets are denominated in HK dollars.

2.2.2 Non-cash payment terminals

Three electronic non-POS debit instruction services are available in Hong Kong, namely PPS, JET payment and ETC bill payment. They are used mainly to pay utility bills and other charges.

EPSCO operates PPS, which offers payment services over the phone and on the internet, and ETC bill payment, which is available only on ETC ATMs (by using ETC ATM cards). On the other hand, JET Payment, the payment scheme operated by JETCO, is available on JETCO ATMs (by using JETCO member banks' ATM cards) and on the internet. Consumers must register in advance to use PPS but there is no such requirement for the other two schemes (JET Payment and ETC bill payment).

3. Payment systems

3.1 General overview

Interbank fund transfers are made through payment systems that are essential components of the financial infrastructure. Hong Kong's interbank payment systems support interbank transfers in the HK dollar, US dollar, euro, and renminbi. Banks can then extend money transfer services to their customers. Hong Kong Interbank Clearing Limited (HKICL) is the operator of the interbank payment systems, providing banks with various interbank clearing and settlement services. Links with payment systems and debt securities systems in other jurisdictions have been developed to provide an easily accessible payment and settlement platform for cross-border economic transactions and financial intermediation.

3.2 Large-value payment systems

3.2.1 The real-time gross settlement (RTGS) system for HKD

The HKD RTGS system, known as HKD CHATS, was launched in December 1996.

3.2.1.1 Institutional framework

The HKD CHATS was deemed to be designated as a systemic system under the CSSO in 2004, and thus the settlement of transactions made through the system is final and irrevocable. At the same time, the system was also granted a certificate of finality, in view of its compliance with the security and efficiency requirements under Section 7(1) of the CSSO. The certificate of finality provides statutory backing for the finality of settlement for transactions settled through the system. This finality is protected by the CSSO from insolvency laws and other legislation.

The settlement institution (SI) for the HKD CHATS is the HKMA through the Payment Systems Operation Division of its Financial Infrastructure Department (FID). The SI in turn appoints Hong Kong Interbank Clearing Limited (HKICL), which is jointly owned by the HKMA and the Hong Kong Association of Banks (HKAB), as the system operator of the HKD CHATS. The HKAB represents the interests of the banking community in Hong Kong (see Section 1.3.4.1).

3.2.1.2 Participation

All LBs in Hong Kong are required to maintain a settlement account with the HKMA. In May 2000, the HKMA announced that RLBs in Hong Kong could also access the HKD CHATS if they could demonstrate a business need to do so. As at the end of 2010, some 141 settlement accounts were maintained with the HKMA.

3.2.1.3 Types of transactions handled

(i) Large-value RTGS transactions

HKD CHATS transactions are settled in real time on a gross basis across the books of the HKMA. The payments are final and irrevocable once the funds are transferred across the books of the HKMA.

(ii) Small-value bulk clearing items

In addition to settling large-value payments, CHATS also handles daily bulk clearings of stock market transactions, credit card transactions, cheques, small-value bulk electronic payment items (EPS, auto-credit and auto-debit transactions), and small-value ATM transfers. These items are cleared through HKICL on a bulk clearing and multilateral netting basis.

With the support of the HKMA, HKAB commissioned HKICL to implement the Cheque Imaging and Truncation System (CITS) on an industry-wide basis. This new system began operating in June 2003. CITS has transformed the clearing process for cheques. Under CITS, small-value cheques are exchanged and cleared on the basis of an electronic presentation of cheque images and the relevant cheque data. This reduces the need for banks to physically deliver small-value cheques for clearing and settlement. Larger-value cheques, and special items (such as suspicious cheques) regardless of their value, are still presented physically together with their images to the paying banks. With cheque imaging and truncation, the data and images taken from cheques are cheaper to handle and store and can be retrieved almost instantaneously from the image database through computer workstations.

3.2.1.4 Operation of the system

The RTGS system operator is HKICL. The system is open from 08:30 to 18:30 (Hong Kong Time) every working week, Monday to Friday. Interbank transactions can be settled during these operating hours. Transactions for end-customers must be submitted before 18:00 for same-day settlement.

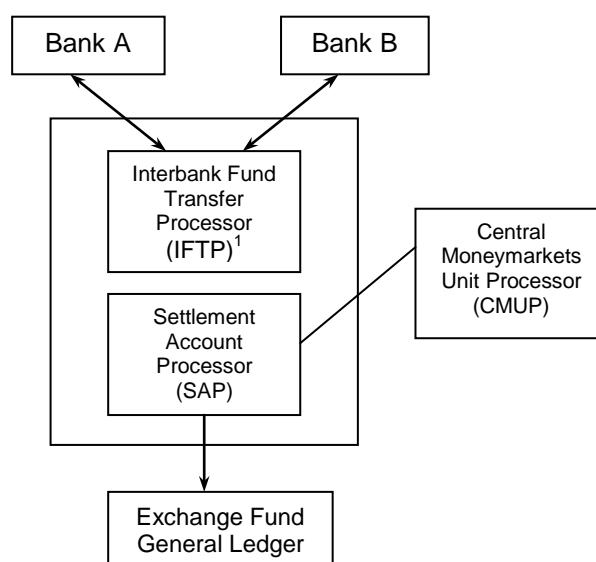
3.2.1.5 Settlement procedures

Since May 2009, the HKD CHATS has been operating on the SWIFTNet platform, which helps to enhance interoperability between domestic and international messages for payment instructions. This makes it easier for overseas institutions to join the RTGS systems in Hong Kong. Participating banks exchange payment messages with CHATS via SWIFTNet FIN Y-Copy service, which allows message senders to forward a copy to a third party (the system operator) for authorisation or further processing before sending the message to the receiver.

Payment instructions are settled immediately if there is sufficient balance in the settlement account. Banks without sufficient balances in their settlement accounts have their payment instructions queued in the system. Alternatively, the banks can make use of the seamless interface between the Settlement Account Processor (SAP) and the debt securities clearing system (which is known as the CMU Processor or CMUP), to sell and repurchase their EFBNs during the day in the form of intraday repo transactions to obtain interest-free intraday liquidity from the HKMA.

Diagram 1

Design of Hong Kong's RTGS system



¹ IFTP is a real-time computer system designed to process interbank payment transactions electronically and provides administrative functions so that HKICL can monitor, maintain and control the IFTP.

Diagram 1 depicts the basic system design of HKD CHATS. The system comprises a Settlement Account Processor (SAP) and an Interbank Fund Transfer Processor (IFTP). The IFTP is a computer system designed to process interbank fund transfer transactions in real time. The SAP holds settlement accounts for all member banks. All interbank fund transfer transactions are processed by the IFTP and then routed to the SAP for posting and settlement. The linkage with the Central Moneymarkets Unit Processor (CMUP) is to support intraday and overnight repo transactions through which members can obtain intraday liquidity or overnight funding as needed.

All member banks are required to strictly adhere to the operational rules set out in the HKD Clearing House Rules. In addition, all participants of the HKD CHATS are required to comply with the terms and conditions in the account opening form and other documents as specified by the HKMA and HKICL.

The HKMA is the settlement institution of the HKD CHATS and the system is operated by HKICL.

All RTGS transactions are settled in real time on a gross basis. When a payment has been settled across the books of the HKMA, it is regarded as final and irrevocable.

Delivery vs payment (DVP)

Since a seamless interface between SAP and CMUP was established in December 1996, the HKD CHATS has supported a real-time and end-of-day DVP facility for HK dollar-denominated debt securities lodged with the CMU. A similar seamless interface was also established with CCASS. Market participants can make use of this linkage to arrange real-time and end-of-day DVP for HKD-denominated shares that are listed on SEHK.

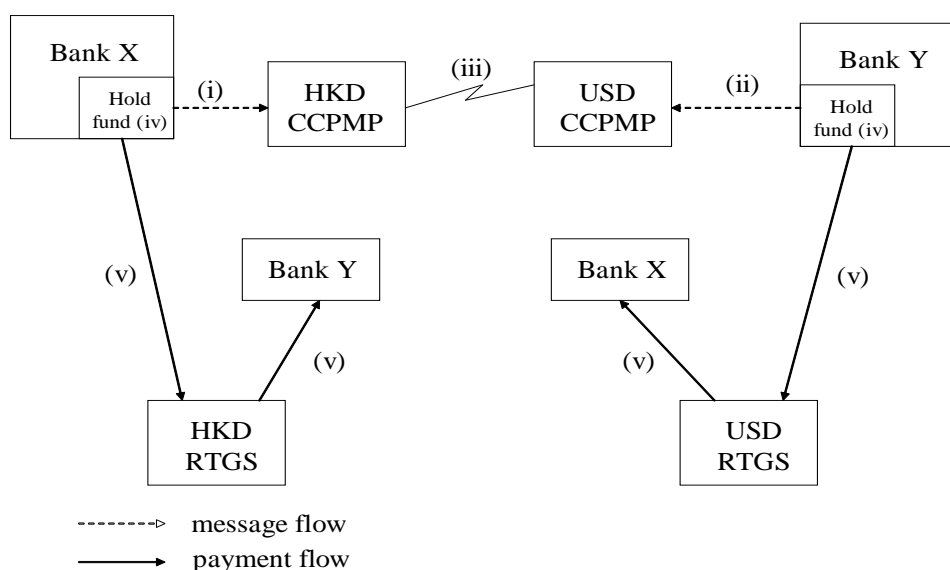
Payment vs payment (PVP)

The HKD CHATS is linked with the USD CHATS, EURO CHATS and RMB CHATS (see Section 3.2 for information on these foreign currency clearing systems in Hong Kong) for PVP settlement of USD/HKD, EUR/HKD and RMB/HKD foreign exchange transactions respectively. This PVP device (which is known as the Cross-Currency Payment Matching Processor, or CCPMP) was the first electronic foreign exchange PVP mechanism to ensure simultaneous settlement of both legs of these foreign exchange transactions, thus eliminating Herstatt risk. With PVP settlement and the consequent elimination of Herstatt risk, the application of bilateral counterparty trading limits is no longer relevant, and traded currencies can be put to immediate use in the respective clearing systems, thus improving interbank liquidity.

Diagram 2 depicts the PVP mechanism, using the HKD/USD PVP as an example. In this example Bank X sells HK dollars to Bank Y in exchange for US dollars. On the settlement day, (i) Bank X sends a PVP payment transaction to Bank Y in the HKD RTGS system. Bank Y (ii) also initiates a mirror PVP payment transaction in the USD RTGS system. The CCPMP for HKD and the CCPMP for USD will then (iii) communicate with each other and attempt to match the transaction. After successful matching, the HKD RTGS system and USD RTGS system will (iv) respectively hold the HKD funding of Bank X and the USD funding of Bank Y in their own settlement accounts. If both Bank X and Bank Y have sufficient funds, the two RTGS systems will (v) transfer the funds to their respective counterparty simultaneously.

Diagram 2

Operational flow of PVP settlement



3.2.1.6 Management of credit and liquidity risk

The HKMA has introduced a number of risk management measures to ensure smooth processing in the HKD CHATS.

- (i) **Liquidity management:** the availability of intraday liquidity is crucial in an RTGS system if the potential for payment gridlock is to be reduced. In this regard, the HKD CHATS has various features that facilitate liquidity management for banks. Banks can view the balance on their settlement accounts in real time. They also have access to the net amounts they need to pay (or receive) for each of the bulk clearing runs that take place during the day so that they can arrange funding in advance for settlement purposes as necessary.
- (ii) **Repo facility:** banks can arrange with the HKMA to obtain liquidity through a repo facility. If a bank does not have a sufficient balance in its settlement account to effect an outgoing payment during the day before the intraday repo cutoff time, but has sufficient EFBNs in its intraday repo account, the system can automatically trigger (or the bank can manually trigger) an intraday repo transaction to generate the credit balance required to cover the shortfall. A bank can repurchase the repo transaction at any time before system close. Intraday repos that cannot be repurchased before system close will be automatically rolled into overnight borrowing under the Discount Window on which interest is charged by the HKMA. In addition, banks can arrange overnight repos with the HKMA manually through the Discount Window facility as required.
- (iii) **Queuing mechanism:** the system design of the HKD CHATS allows a participant to manage the sequencing of payments. If a bank does not have sufficient balance in its settlement account to effect a payment, the transaction is queued in the system. Banks can make use of a re-sequencing function to move the selected transaction up or down their list of queued payments. The queuing mechanism allows the banks to manage their own queues of payment instructions by cancellation and re-sequencing.
- (iv) **Monitoring:** to ensure the smooth processing of the payment system, the HKMA closely monitors the payment condition of each bank on a real-time basis.
- (v) **Throughput guidelines:** in December 1996, the HKMA issued a guideline to banks on their CHATS throughput in order to encourage banks to make payments in a timely and an orderly manner throughout the day. The throughput guideline has been revised as the operating window of the HKD CHATS was extended in phases through 2007–08. Each bank is now required to have released and settled not less than 35% of its interbank RTGS payments (by value) for the day by 13:30, and 70% of them by 16:30. The HKMA closely monitors banks' compliance with throughput targets and opens discussions with individual banks if they consistently underperform.
- (vi) **No overdraft:** settlement account holders are not required to maintain a minimum amount or reserve in their settlement accounts with the HKMA. Nonetheless, the settlement accounts are not allowed to go into overdraft.
- (vii) **Confidentiality:** although banks input the full details of their payment instructions, including customer information, into IFTP, their instructions are stripped so that only the settlement instruction (ie information on the amount, the paying bank and the receiving bank) of the payment instruction is passed onto the SAP.
- (viii) **Liquidity Optimisers:** the HKD CHATS features two types of optimiser that help increase liquidity efficiency. The first is the RTGS Liquidity Optimiser (RLO) which is a liquidity-saving device introduced in January 2006 to improve liquidity efficiency through periodic multilateral offsetting of payment instructions queued in the HKD CHATS. Apart from scheduled RLO runs at set intervals, runs can also be triggered

by the HKMA as necessary. The second type of optimiser helps to improve liquidity efficiency by netting bulk settlement payments in a bulk settlement run. This category includes the CHATS Optimiser introduced in June 2004 (which is settled with paper cheques and other clearing items in the 14:15 settlement run simultaneously), Cross-Currency CHATS Optimiser introduced in October 2006 (which combines the CHATS Optimiser with the PVP mechanism) and CCASS Optimiser introduced in January 2008 (which is settled with CCASS transactions simultaneously).

3.2.1.7 Pricing

All expenses incurred by HKICL in providing, managing and operating the clearing house and the clearing facilities are borne by HKICL, which in turn recovers the expenses through charging the banks fees for use of the clearing facilities on a cost recovery basis. A tiered pricing structure in which frequent users will be charged less on an average basis is adopted.

3.2.1.8 Migration to SWIFTNet platform

The SWIFTNet migration project, which replaced the proprietary platform of the RTGS systems and CMU in Hong Kong with an open SWIFTNet platform and improved the real-time interactive user interfaces, was completed after the successful launch of Phase 2 of the project in July 2010. The migration has enhanced interoperability between domestic and international messages for payment instructions, making it simpler for overseas institutions to join the RTGS systems in Hong Kong and thus reinforcing Hong Kong's status as an international financial centre.

3.2.2 Real-time gross settlement (RTGS) systems for USD, EUR and RMB

There are three foreign currency RTGS systems in Hong Kong, which include the US dollar, euro and renminbi RTGS systems.

3.2.2.1 Institutional framework

The US dollar RTGS system in Hong Kong (known as USD CHATS) was launched in August 2000, while the euro RTGS system in Hong Kong (known as EURO CHATS) was launched in April 2003. The purpose of the USD and EURO CHATS is to provide efficient settlement of US dollar and euro transactions during Asian business hours. Given Hong Kong's role as an international financial centre, and the US dollar's and the euro's role as two of the world's most important currencies, there is a strong business case for improved mechanisms for settling US dollar and euro payments in Hong Kong. The settlement institutions of the USD and EURO CHATS are commercial banks appointed by the HKMA with franchise renewal every five years.

The renminbi RTGS system in Hong Kong (known as RMB CHATS) was launched in June 2007 as an upgrade from the Renminbi Settlement System established in March 2006. It caters for the settlement needs arising from the increasing volume of renminbi business in Hong Kong. The clearing bank of the RMB CHATS, which is a commercial bank appointed by the People's Bank of China, maintains a settlement account with the People's Bank of China. It is also a member of China's National Advanced Payment System (CNAPS), the nation's real-time gross settlement system.

In terms of system design, the USD CHATS, EURO CHATS and RMB CHATS are almost exact replicas of the HKD CHATS, except for the following characteristics:

- The settlement institutions (SIs)/clearing bank (CB) for the foreign currency RTGS systems are commercial banks. Each direct participant opens and maintains a settlement account with the SIs/CB and all transactions are settled across the books of the SIs/CB.

- The USD and EURO CHATS adopt a two-tier membership structure in which banks can join the system as either direct participants or indirect participants. The system also accepts overseas members that are approved by the HKMA and the SI.
- Unlike the HKD CHATS, the USD SI and EUR SI provide a clean intraday overdraft facility to the direct participants in the system to facilitate their liquidity management.

3.2.2.2 Participation

Participation in the USD CHATS, EURO CHATS and RMB CHATS is not mandatory. At the end of 2010, the USD CHATS had 224 participants, the EURO CHATS 50, and the RMB CHATS 96. Most of the participants are banks.

3.2.2.3 Types of transactions handled

(i) Large-value RTGS transactions

All USD, EUR and RMB CHATS transactions are settled in real time on a gross basis across the books of the respective SI/CB. The payments are final and irrevocable when funds are transferred across the books of the SI/CB.

(ii) Small-value bulk clearing items

The USD CHATS and RMB CHATS have fewer bulk clearing and settlement items than the HKD CHATS, and there are currently no bulk clearing and settlement items for the EURO CHATS. Bulk clearing and settlement items available in the USD CHATS currently include paper cheque, credit card and stock-related items. To cater for the recent expansion of the scope of RMB business in Hong Kong, a series of enhancements to the RMB CHATS has created bulk clearing and settlement items related to autopay and stock transactions on top of the existing paper cheques. The mechanics for the clearing and settlement process for these items are similar to those for the HKD CHATS.

3.2.2.4 Operation of the system

The operator of the USD CHATS, EURO CHATS and RMB CHATS is HKICL. The system is open from 08:30 to 18:30 every working week, Monday to Friday. During the above operating hours, banks can settle their interbank transactions. Customer-related transactions have to be handled before 18:00. Since November 2009, the USD CHATS, EURO CHATS and RMB CHATS have operated on all Hong Kong general holidays, except 1 January which is a holiday worldwide. This facilitates the use of Hong Kong's RTGS systems by local and overseas institutions to process their regional payments and helps reinforce Hong Kong's role as a payment and settlement hub in the region.

3.2.2.5 Settlement procedures

The settlement institutions of the USD CHATS and EURO CHATS are The Hongkong and Shanghai Banking Corporation and Standard Chartered Bank (Hong Kong) respectively, while the clearing bank of the RMB CHATS is Bank of China (Hong Kong).

(i) RTGS

All RTGS transactions are settled real-time on a gross basis. When a payment is settled across the books of the settlement institution or clearing bank, it is regarded as final and irrevocable.

(ii) Bulk settlement

Bulk settlement is designed to handle small-value bulk clearing items. All bulk clearing items are settled on a multilateral netting basis and on the next business day. They are settled after

any returned items have been identified and adjusted in order to eliminate the settlement risk arising from returned items.

(iii) Delivery vs payment (DVP)

The USD CHATS, EURO CHATS, RMB CHATS are linked up with the CMUP (ie the debt securities clearing system operated by the HKMA) to support real-time and end-of-day DVP facility for debt securities denominated in USD, euro and RMB respectively that are lodged with the CMU. A similar seamless interface has been established with CCASS for the USD CHATS and RMB CHATS. Market participants can make use of such a linkage to arrange both real-time and end-of-day DVP facility for USD- and RMB-denominated shares which are traded on SEHK.

(iv) Payment vs payment (PVP)

The HKD, USD, EUR and RMB CHATS are linked together for the PVP settlement of USD/HKD, EUR/USD, USD/RMB, EUR/HKD, EUR/RMB, RMB/HKD foreign exchange transactions. This PVP device, which is known as the CCPMP, ensures that both legs of the foreign exchange transaction are settled simultaneously to eliminate Herstatt risk.

The USD CHATS has also established PVP links with Malaysia's ringgit RTGS system and Indonesia's rupiah RTGS system to improve the settlement efficiency of the US dollar/ ringgit and the US dollar/rupiah pairs and reduce the attendant Herstatt risk.

3.2.2.6 Management of credit and liquidity risk

Various risk management measures are instituted:

- (i) Management of liquidity: like the HKD CHATS, the USD CHATS, EURO CHATS and RMB CHATS have features that facilitate liquidity management for the participating banks. Banks can monitor the balance on their settlement accounts in real time. In addition, they have access to the net amounts they will need to pay (or receive) for each of the bulk clearing runs that take place during the day.
- (ii) Intraday overdraft: in contrast to the HKD CHATS, the direct participants of the USD CHATS and EURO CHATS may go into overdraft by making use of the interest-free intraday overdraft facility provided by the respective settlement institutions for the US dollar and euro. When a direct participant does not have a sufficient credit balance to effect its payment instructions, the bank can make use of the overdraft provided to complete its payments to counterparties.
- (iii) Repo facility: as in the HKD CHATS, participating banks of the USD CHATS and EURO CHATS can obtain liquidity through a repo facility. If a bank does not have a sufficient balance on its settlement account to effect an outgoing payment but has sufficient EFBNs in its intraday repo account, the system can automatically trigger (or the bank can manually trigger) an intraday repo transaction to generate the credit balance required to cover the shortfall. A bank can repurchase the repo transaction at any time before system close. Intraday repos that cannot be repurchased before system close are rolled into overnight borrowing on which the settlement institution charges interest. A similar intraday-day repo facility for the RMB CHATS will be launched in early 2011.
- (iv) Queuing mechanism: as in the HKD CHATS, transactions are queued in the USD, EUR and RMB CHATS systems if a bank does not have sufficient balance on its settlement account to effect its payments. The bank can make use of the re-sequencing function to move a selected transaction up or down its list of queued payments. The queuing mechanism lets banks manage their own queues of payment instructions by cancelling and resequencing them.

- (v) **Monitoring:** the SI/CB closely monitors the payment condition of each direct participant on a real-time basis. Through the SAP, the SI/CB and the HKMA can access the position of each bank as well as each transaction details (up to bank level only). The HKMA also closely oversees the performance of the SI/CB. The HKMA meets regularly with the SI/CB to discuss issues relevant to the users of the foreign currency clearing systems.
- (vi) **Throughput guidelines:** as in the case of the HKD CHATS, participant banks in the USD CHATS and EURO CHATS must comply with the CHATS throughput guideline by which each direct participant is required to release and settle interbank payments that are not less than 35% of the value of its total CHATS payments for the day by 13:30 and those of not less than 70% by 16:30.
- (vii) **Confidentiality:** as in the HKD CHATS, only the settlement instruction (ie information on the amount, the paying bank and the receiving bank) of the payment instruction is passed onto the foreign currency SAP.
- (viii) **Liquidity Optimisers:** as in the HKD CHATS, the foreign currency CHATS feature the RTGS Liquidity Optimiser (RLO) to improve their liquidity efficiency. CHATS Optimiser, CCASS Optimiser and Cross-Currency CHATS Optimiser will soon be introduced to the RMB CHATS to cater for the growing volume of renminbi business in Hong Kong.

3.2.2.7 Pricing

The USD CHATS, EURO CHATS and RMB CHATS adopt a tiered pricing structure in which frequent users will be charged less on an average basis. The fees charged by HKICL require the approval of the respective SI/CB and the HKMA.

3.2.2.8 Enhancements to the RMB CHATS

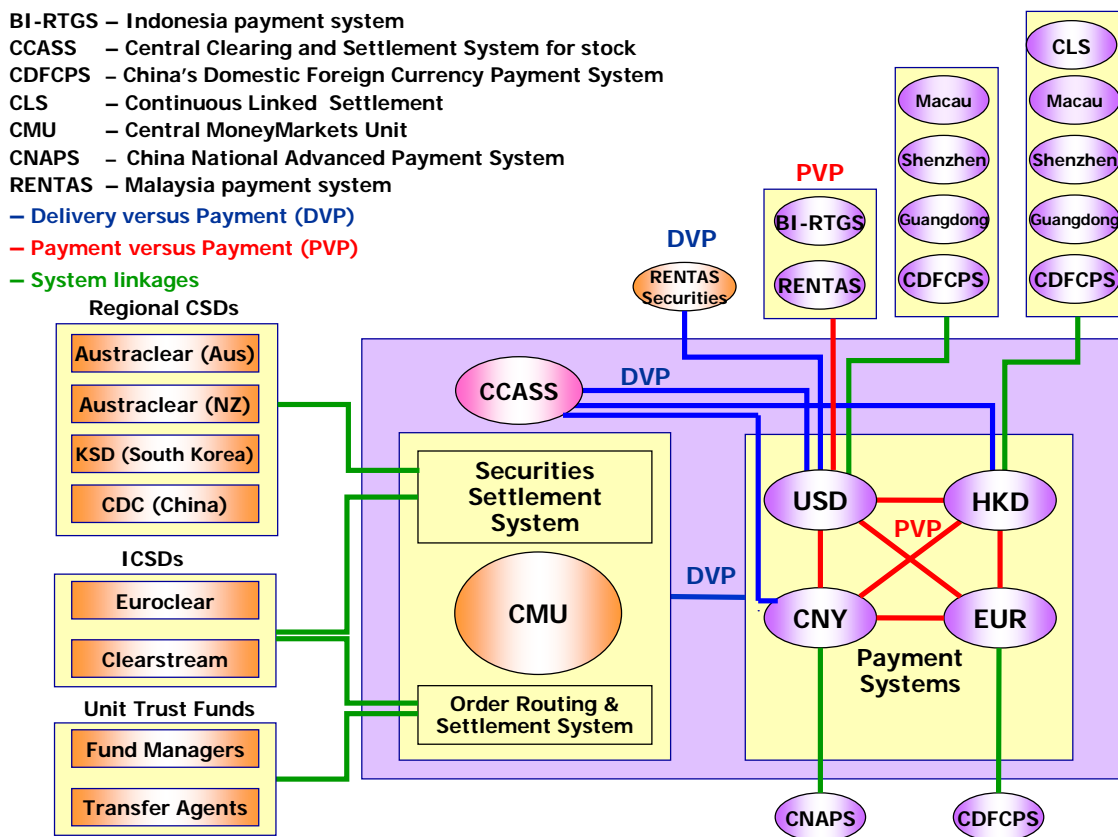
A new liquidity saving device, the RTGS Liquidity Optimiser (RLO) and a new DVP function for supporting listing of RMB-denominated securities on SEHK were recently added to the RMB CHATS. These are intended to support the new business opportunities from the growing volume of renminbi business in Hong Kong, especially under the revised Settlement Agreement on the Clearing of Renminbi Businesses between People's Bank of China and the Clearing Bank of the RMB RTGS system (the revised Clearing Agreement) effective from July 2010. The functionalities of the RMB CHATS will be gradually brought into line with those of the HKD CHATS to ensure that the system is capable of supporting a full range of financial activities.

3.3 Payment links

Over the years, the HKMA has built a robust and efficient multicurrency payments platform, with extensive domestic and overseas system linkages as shown in Diagram 3 below. Apart from the three foreign currency RTGS systems and the local currency RTGS system, Hong Kong has also established various payment links with other central banks in the Asia region and also with the Mainland.

Diagram 3

Hong Kong’s multicurrency payment and settlement infrastructure



3.3.1 Cross-border PVP links

The first cross-border PVP link was established between Hong Kong’s USD CHATS and Malaysia’s ringgit RTGS systems in November 2006 while the second PVP link was set up between Hong Kong’s USD CHATS and Indonesia’s rupiah RTGS systems in January 2010. As mentioned earlier, PVP greatly improves settlement efficiency and eliminates settlement risk arising from time zone differences and time lags in settlement. These PVP links also enhance Hong Kong’s status as the regional payment and settlement hub.

3.3.2 Payment links with the Mainland

The HKMA has been working closely with Mainland authorities in providing efficient cross-border payment links to meet growing demand. The HKMA has established links for both HKD and USD CHATS with Shenzhen and Guangdong. These allow the efficient and safe settlement of cross-border payments in HK dollars and US dollars between banks in Hong Kong and their counterparts in Shenzhen and Guangdong.

Hong Kong has also established two-way clearing arrangements for HK dollar-denominated cheques with Guangdong and Shenzhen, as well as joint two-way US-dollar cheque clearing with Shenzhen, and one-way renminbi joint cheque-clearing with Guangdong and Shenzhen. The two-way joint cheque-clearing facilities shorten the clearing time for cheques drawn on banks in Hong Kong and presented in Shenzhen and Guangdong, and vice versa. The one-way RMB joint cheque-clearing at present only covers RMB cheques drawn on banks in Hong Kong and presented in Shenzhen and Guangdong.

The RTGS cross-border links with the Mainland's Domestic Foreign Currency Payment Systems were launched in March 2009. The multi-currency cross-border payment arrangements settle HK dollars, US dollars, euros and sterling payments between the Mainland's Domestic Foreign Currency Payment Systems and the HKD, USD and EURO CHATS in Hong Kong. Settlements for transactions denominated in sterling are made through a correspondent bank in Hong Kong. These arrangements allow Mainland and Hong Kong banks to manage their liquidity more efficiently and provide cross-border payment services competitively in the Asian time zone, thus reducing settlement risk. While the operating mechanism is similar to that of the HK dollar and US dollar RTGS links with Shenzhen and Guangdong, the geographical coverage has been expanded to a wider range of Mainland cities.

3.3.3 Payment links with Macau

The one-way joint clearing facility for HK dollar-denominated cheques between Hong Kong and Macau was launched in August 2007 and a similar facility for US dollar cheques was launched in June 2008 to meet growing demand. These facilities reduce the time required for clearing HK dollar and US dollar cheques issued by banks in Hong Kong and presented in Macau from four or five days to two.

4. Systems for post-trade processing, clearing and securities settlement

4.1 General overview

Securities traded in Hong Kong are cleared and settled through two distinctive securities settlement systems, namely the Central Moneymarkets Unit (CMU) operated by the HKMA for the clearing and settlement of government-issued and private sector debt securities, and the CCASS operated by the Hong Kong Securities Clearing Company (HKSCC) for the clearing and settlement of equity securities traded on the Stock Exchange of Hong Kong (SEHK). Both the CMU and the CCASS act as central securities depositories (CSDs). While the CMU is not a central counterparty (CCP), CCASS is a central counterparty securities settlement system.

4.2 Post-trade processing systems

4.2.1 Trade repository

The HKMA will establish a local trade repository for OTC derivatives by end-2012. The initiative responds to the G20's commitment to accelerate the implementation of OTC derivatives regulation and supervision and to increase transparency and standardisation in the OTC derivatives markets. The trade repository will cover a number of standardised OTC derivatives asset classes. A linkage will be developed between the trade repository and the central counterparty clearing facility for OTC derivatives to be launched by the SEHK to allow eligible transactions to be passed to the central counterparty for central clearing. The HKMA will work in concert with other regulatory authorities to develop a regulatory framework for TR reporting.

4.3 Central counterparties and clearing systems

As mentioned above, CCASS is a central counterparty securities settlement system (see Section 4.4.2.4 for the CCP functions of CCASS).

4.4 Securities settlement systems

Securities traded in Hong Kong consist mainly of EFBNs, private debt securities, and equity securities. These transactions are cleared and settled through two different securities settlement systems:

- the CMU operated by the HKMA, which clears and settles Exchange Fund Bills and Notes (EFBN), bonds issued by the government of the Hong Kong SAR, and debt securities issued by both public and private sector entities; and
- CCASS operated by the HKSCC, which clears and settles equities securities traded on the Stock Exchange of Hong Kong (SEHK).

Both the CMU and the CCASS also act as CSDs (see Sections 4.4.1.6 and 4.4.2.6 for a brief overview).

4.4.1 Central Moneymarkets Unit

4.4.1.1 Types of assets and products cleared and settled by CMU

Securities products cleared and settled by CMU include the Exchange Fund Bills and Notes (EFBN), bonds issued by the government of the Hong Kong SAR, and debt securities issued by both public and private sector entities.

4.4.1.2 Institutional framework for CMU

The CSSO empowers the HKMA to designate and oversee clearing and settlement systems that are material to the monetary or financial stability of Hong Kong or to the functioning of Hong Kong as an international financial centre. The CSSO also protects the settlement finality of transactions effected through such designated systems from insolvency laws or other legislation. The CMU is deemed to have been designated under the CSSO since 4 November 2004 and all transactions effected through the CMU have since enjoyed statutory backing for their settlement finality.

4.4.1.3 Participation in CMU

There are two types of membership:

- (i) **Recognised Dealers (RDs) and Market Makers (MMs):** a two-tier dealership scheme was set up when the EFBN Programmes were implemented. A number of RDs and MMs in EFBNs were appointed by the HKMA. In return for certain privileges, the RDs and MMs are obliged to support, with different degrees of commitment, the development of the EFBN market. RDs participate in the secondary market and promote EFBNs in the retail market. For their part, MMs are appointed from the pool of RDs and participate actively in the primary market. They have the added responsibility of maintaining secondary market liquidity. Only the RDs and MMs are eligible to settle EFBNs through the CMU. The Government Bond Programme (GBP), which was set up in 2009, also adopted the two-tier dealership scheme. A number of RDs and Primary Dealers (PDs) were also appointed by the HKMA. Similarly, the GBP's RDs participate in the secondary market while some RDs are additionally appointed as PDs to participate actively in the primary market.
- (ii) **CMU Members:** Those who fulfil the following membership criteria are eligible to join the CMU as CMU Members to settle and clear private sector debt securities:
 - Als in Hong Kong and/or
 - Members of the Asia Capital Markets Association.

At the end of December 2010, there were 156 CMU Members and 143 RDs/MMs/PDs. The rights and obligations of RDs/MMs/PDs and CMU Members using the CMU service are set

out in the “Appointment Letter of Recognised Dealer/Market Maker/Primary Dealer” and “CMU Membership Agreement” respectively.

CMU Participants are required to maintain separate accounts for their own holdings and clients’ holdings. A client with substantial holdings may request the CMU Member to open a specific custody account under his name.

4.4.1.4 Overall explanation of the CMU settlement process

(i) Pre-settlement trade matching and confirmation

The CMU provides two types of trade matching services for its participants.

For real-time DVP, both the seller and the buyer input instructions through their CMT or SWIFT. Once the instruction is matched, it is stored in the system. When the funds and securities are sufficient, settlement takes place immediately. The securities accounts and settlement accounts of the buyer and the seller are debited and credited simultaneously. If the seller does not have sufficient securities, the system will retry at 15-minute intervals until the cutoff time. At this point, all unsettled transactions are converted to end-of-day transactions and settled during the end-of-day settlement run. If the buyer does not have sufficient funds in its cash accounts, the transactions are held as pending for settlement until sufficient funds are available in the buyer’s accounts. If the transactions cannot be settled before the cutoff time, the transactions are converted to end-of-day transactions and settled during the end-of-day settlement run.

For end-of-day transactions, securities and cash are settled on a multilateral netting basis. At the settlement time of end-of-day settlement run, the CMU calculates the net settlement amount of both securities and cash for each member. CMU will then check whether sufficient funds and securities are available for each member. If so, final transfers of both securities and cash for all members are effected simultaneously. Otherwise, all or part of the transfer instructions of members with insufficient funds or securities are cancelled before final end-of-day settlement takes place.

(ii) Settlement

All debt instruments cleared through the CMU are either immobilised or dematerialised, and transfer of title is effected in computer book-entry form.

The CMU service offers two types of settlement mode: (i) delivery versus payment (DVP) and (ii) free of payment (FOP). Through the seamless interface with the HKD, USD, EUR and RMB RTGS systems, the CMU provides real-time DVP settlement for its members. Members who are direct participants of the HKD, USD, EUR or RMB RTGS systems can settle the transaction directly through their cash clearing account with the SIs/CB of the respective RTGS systems. Non-participants in the RTGS system must appoint a settlement bank to execute payments arising from their securities transactions.

Transactions for which real-time settlement is required are settled on a gross basis. The real-time window is open from 8:30 until 16:00. Unsettled transactions are automatically converted into end-of-day transactions, which are settled on a multilateral netting basis. The end-of-day settlement run starts at 16:05 and completes before 17:00.

For OTC trades, the settlement cycle could be as short as T+0, subject to the arrangement between the trading parties. For exchange-traded transactions, the settlement cycle is T+2.

4.4.1.5 Arrangements for money settlement in CMU

As mentioned in Section 4.4.1.4, payments for transactions are executed through the interbank payment systems in HK dollars, US dollars, euros or renminbi either in real time (via RTGS) or through a batch of direct debit and credit transactions generated by the system at the end-of-day settlement run.

Non-participants in the interbank payment system must appoint settlement banks to execute payments arising from their securities transactions.

4.4.1.6 CMU as a central securities depository (CSD)

The CMU acts as the CSD for Hong Kong domestic debt securities and provides members with the following core facilities:

- a front-end system that allows users to transmit transfer instructions, make enquiries and request reports;
- a safe custody service for EFBNs, government bonds and private sector debt securities;
- a collateral management system;
- a securities lending and borrowing programme;
- a bilateral linkage system with the ICSDs such as Euroclear and Clearstream and regional CSDs such as Austraclear in Australia, NZClear in New Zealand and Korea Securities Depository in Korea;
- a tender allocation process that automates the processing of tendering;
- interest payments and redemption processing through a link with the RTGS payment systems; and
- income distribution services.

4.4.1.7 Risk management of CMU

The CMU is not a central counterparty for securities transactions and does not guarantee settlement. Settlement of transactions will fail if buyers have insufficient funds or sellers have insufficient securities. Failed transactions are automatically cancelled from the system when the CMU system closes.

Nor does the CMU grant credit facilities to its members for the purpose of settling securities transactions. Bank members can obtain the necessary intraday liquidity through automatic intraday repo transactions with the SIs of the payment systems. Therefore, the CMU is not exposed to the credit risk of its members.

For its part, the CMU system creates no credit exposures between its members arising from the settlement of securities transactions because the CMU provides both real-time and end-of-day DVP facilities to its members. However, as the settlement is not guaranteed, a CMU member may be liable for the replacement cost if a securities transaction fails to settle. This replacement risk can be reduced by settling the transactions on a real-time DVP basis.

To assure business continuity, the CMU has a hot backup site located outside the central business district. Production data is copied to the site in real time. In the event of any disruption at the production computer centre, the backup site can be activated within half an hour. A detailed contingency plan covers clearing and data processing using the remote site. The plan addresses both a major operational failure at the production site and the failure of a participant's CMU terminal.

To mitigate operational risks, the CMU has a comprehensive system of internal controls and procedures, which are subject to both internal and external audits. Internal auditing is continuous while the external audit takes place annually.

The Audit Commission is the external auditor of the government's accounts. It provides independent audit services to the Legislative Council and public sector organisations to assure the efficient and effective use of public resources and to enhance public sector accountability in Hong Kong.

The HKMA's internal auditor has the primary objective of assisting the HKMA's management in the effective discharge of its responsibilities and functions. This is achieved through comprehensive audit coverage to ensure that the HKMA's assets and resources are appropriately safeguarded and accounted for, and that established procedures and guidelines are adhered to. The internal auditor assesses and reports on the effectiveness of the financial and accounting systems as well as the management reporting system.

4.4.2 CCASS

4.4.2.1 Types of assets and products cleared and settled by CCASS

Products cleared and settled by CCASS include equity securities (ordinary shares and preference shares), depositary receipts, equity warrants, debt securities, unit trusts and mutual funds (including exchange-traded funds (ETFs) and real estate investment funds (REITs) and structured products such as derivative warrants, callable bull/bear contracts and listed equity-linked instruments).

4.4.2.2 Institutional framework for CCASS

The operation of CCASS by HKSCC is overseen by the Securities and Futures Commission (SFC), which is an independent statutory body under the Securities and Futures Ordinance (SFO). HKSCC is required under the SFO to ensure that (i) there are orderly, fair and expeditious clearing and settlement arrangements for securities or futures contracts cleared or settled through CCASS; and that (ii) risks associated with the business and operations of CCASS are managed prudently.

4.4.2.3 Participation in CCASS

There are seven types of CCASS participants, including:

1. Direct Clearing Participants – which must be exchange participants of the Stock Exchange of Hong Kong (SEHK) and corporations licensed to carry out dealing in securities under the SFO.
2. General Clearing Participants – which must be corporations licensed to carry out dealing in securities under the SFO or institutions that are registered to carry out securities dealing under the SFO.
3. Custodian Participants – which must be authorised institutions (AIs) under the Banking Ordinance, or trust companies registered under the Trustee Ordinance, or corporations licensed to carry out dealing in securities under the SFO but not exchange participants of SEHK. The HKMA is also a Custodian Participant under the Exchange Fund Ordinance.
4. Investor Participants – Individual Investor Participants must be individuals aged 18 or above, holding Hong Kong or Macau Resident identity cards and not subject to any legal incapacity; Joint Individual Investor Participants must be individuals aged 18 or above, holding Hong Kong identity cards and not subject to any legal incapacity; Corporate Investor Participants must be incorporated under the Hong Kong Companies Ordinance or legal entities established under any other ordinance of Hong Kong or established under the laws of any other jurisdiction outside Hong Kong that is approved from time to time by HKSCC for investor participation purposes.
5. Stock Lender Participants – must have established stock lending business in Hong Kong in securities listed on SEHK or have the financial and operational capacity to establish and operate a stock lending business in Hong Kong and have available a sufficient quantity of securities listed on SEHK for lending.

6. Stock Pledgee Participants – must be AIs under the Banking Ordinance or licensed money lenders under the Money Lenders Ordinance and have an established business in Hong Kong of lending money against the security of securities listed on SEHK, or otherwise have the financial and operational capacity to establish and operate such a business.
7. Clearing Agency Participants – must be bodies recognised and regulated in Hong Kong by the SFC or other similar regulatory organisation or, in an overseas jurisdiction, by a governmental body or securities regulatory agency or an equivalent authority in respect of its business in operating a central securities clearing and settlement system and/or a central securities depository system or similar systems.

All exchange participants of SEHK must become CCASS clearing participants or have made arrangements with General Clearing Participants to clear on their behalf under SEHK rules.

4.4.2.4 Overall explanation of clearing and settlement process of CCASS

CCASS determines the obligations of participants to a securities transaction to deliver or receive either cash or securities for the purpose of clearing. CCASS also provides settlement services under which securities are credited or debited to participants' CCASS stock accounts and funds are recorded in the participants' ledgers on settlement day.

Details of all exchange trades (ie trades of eligible securities executed on SEHK), including trade data and trade amendments, are electronically and automatically transmitted to CCASS from the stock exchange (ie SEHK) on each trading day. There is no need for clearing participants to input or further confirm such trade details in CCASS. Clearing participants receive provisional clearing statements of their stock and money positions through their CCASS terminals shortly after 18:00 and 20:00 hours on each trading day for reconciliation. Final clearing statements are available to clearing participants shortly after 14:00 hours on T+1 for confirmation purposes. All exchange trades must be settled on T+2 either via CCASS's Continuous Net Settlement (CNS) system or its Isolated Trades System.

Exchange trades are normally settled via the CNS system on a netting basis, unless isolated for settlement under the Isolated Trades System by the clearing participants at the time of the transaction or by the operator of CCASS (ie HKSCC) for risk management purposes. Under settlement on the CNS system, HKSCC becomes the settlement counterparty to both the buying and selling broker through novation. Acting as the settlement counterparty, HKSCC provides a form of settlement guarantee. The stock transactions of a clearing participant in the same security on the same day are offset against each other, resulting in a single net stock position for the day. Any outstanding unsettled net stock positions of a clearing participant at the end of a settlement day are carried forward to the next settlement day and continuously netted against any opposite stock positions due for settlement in the same security.

Exchange trades isolated for settlement on the Isolated Trades System are settled on a trade-for-trade basis. HKSCC does not substitute itself as the settlement counterparty to isolated trades; it facilitates but does not guarantee settlement.

4.4.2.5 Arrangements for money settlement in CCASS

CCASS money settlement services are provided for all exchange trades of SEHK settled on a DVP basis, whereby securities are delivered only against payment. Trades settled via the CNS system are always on a DVP basis, with money settlement services provided by CCASS. For exchange-based trades settled via the Isolated Trades System, participants can choose to settle them on either a DVP or a FOP basis. If participants choose to settle on a DVP basis, money settlement services are provided by CCASS. If participants choose to settle on a FOP basis, money settlement must be conducted outside CCASS.

Under CCASS money settlement, each participant establishes an account at a designated bank and authorises HKSCC (ie the operator of CCASS) to initiate electronic instructions to debit or credit its designated bank account. Book-entry money records are generated for a participant in its money ledger with respect to its settlement and other financial obligations vis-à-vis HKSCC. The money positions arising from a clearing participant's trades settled under the CNS system in each stock position are netted, resulting in a single net amount due to or from the participant. This is settled by a direct debit or credit instruction issued by HKSCC to the designated bank of the participant at the end of the settlement day. Settlement is processed through the clearing system of HKICL (ie Hong Kong's interbank RTGS system) against participants' designated bank accounts.

Money settlement by clearing participants through their designated banks is generally confirmed in the morning on T+3 (T+3 finality arrangement). In addition to the settlement run for CCASS T+3 money settlement in HK dollars, US dollars and renminbi, a new settlement run for CCASS T+2 money settlement (T+2 finality arrangement) in HK dollars, US dollars and renminbi was implemented in July 2011.

4.4.2.6 CCASS Depository

The CCASS Depository acts as the central securities depository and accepts deposits of eligible securities from participants for settlement and safe custody. Participants of CCASS deposit their shares in the CCASS Depository. Within CCASS, shares are credited to the accounts of the depositing participants in the form of electronic book entries.

4.4.2.7 Risk management of CCASS

The basic features of the risk management of CCASS by HKSCC as the operator are as follows:

(i) Securities-on-hold

All exchange trades of SEHK are due for settlement on the second trading day following the transaction (ie T+2). On T+2, CCASS collects shares from the accounts of clearing participants with net short stock positions and allocates shares to the accounts of clearing participants with net long stock positions under the CNS system. Money ledgers of participants are simultaneously updated. Money settlement by clearing participants through their designated banks is generally confirmed in the morning of T+3.

Securities for which payment has not been confirmed are put on hold on T+2, and clearing participants are not allowed to use or withdraw them. However, a clearing participant can make a cash prepayment to CCASS, or provide it with a bank guarantee, in order to take immediate delivery of the securities.

(ii) Marks

As mentioned in Section 4.4.2.4, HKSCC acts as the counterparty for exchange trades settled via the CNS system of CCASS. As a central counterparty to CNS trades, HKSCC is exposed to market risk from movements in the prices of unsettled stock positions. HKSCC evaluates such risk with reference to the difference between the market value of the stock position and the original contract value. The difference is collected from clearing participants in the form of marks (margins), which reflect the level of risk expressed in money terms. All open positions are marked to market daily at the end of the day. Clearing participants of CCASS have to pay net unfavourable marks in cash or by using stock as collateral to HKSCC. The marking to market and collection of net unfavourable marks help to keep HKSCC's market risk exposure to within the value of a single day's market fluctuations.

(iii) Integrated surveillance

HKSCC continuously monitors the trading activities and open positions of CCASS clearing participants to track their risk exposures relative to their financial resources. Clearing participants' positions are assessed against their liquid capital and degree of diversification. Participants may be investigated if, for example, they have excessively concentrated open positions, are trading beyond an acceptable level or exhibit a sudden surge in turnover.

HKSCC works closely with the SFC, exchanging information on any unusual trading and settlement activities, or on clearing participants with financial problems.

(iv) Collateral

CCASS clearing participants may be required to put up collateral if their financial strength is in question, or their pattern of trading is creating excessive risk. The amount of collateral reflects the level of the clearing participants' contributions to a Guarantee Fund (see paragraph (v) below) and the clearing house's exposure to risk as central counterparty under the CNS system.

(v) Guarantee Fund

A Guarantee Fund is in place to cover risks resulting from losses incurred by CCASS as a result of guaranteeing the trades of a defaulting participant or from the liabilities of HKSCC for defective eligible securities. The Fund can only be drawn on as a last resort. It is made up of contributions from clearing participants, a transfer from HKSCC's reserves and retained earnings.

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

Contents

List of abbreviations	237
Introduction.....	239
1. Institutional aspects	240
1.1 The general institutional framework	240
1.2 The role of the central bank	242
1.2.1 Oversight.....	242
1.2.2 Provision of payment and settlement services	244
1.2.3 Cooperation with other institutions.....	244
1.3 The role of other private and public sector bodies.....	245
1.3.1 The Italian Banking Association.....	245
1.3.2 The Interbank Convention on Automation.....	245
1.3.3 National Centre for Information and Communication Technology in the Public Administration	246
1.3.4 The main interbank service providers	246
1.3.5 Monte Titoli.....	246
1.3.6 The Cassa di Compensazione e Garanzia.....	247
1.3.7 The Companies and Stock Exchange Commission	247
1.3.8 The market management companies.....	247
2. Payment media used by non-banks.....	247
2.1 Cash payments.....	247
2.2 Non-cash payments.....	248
2.2.1 Non-cash payment instruments	248
2.2.2 Non-cash payment terminals	251
2.2.3 Recent developments.....	251
2.2.4 Interchange fee regulation	252
3. Payment systems (funds transfer systems).....	252
3.1 General overview.....	252
3.2 Large-value payment systems	252
3.3 Retail payment systems.....	253
3.3.1 Institutional framework.....	253
3.3.2 Participation.....	253
3.3.3 Types of transaction	253
3.3.4 Operation of the system and settlement process	254
3.3.5 Risk management.....	254
3.3.6 Pricing	254
3.3.7 Major ongoing and future projects	254

4.	Systems for post-trade processing, clearing and securities settlement	255
4.1	General overview.....	255
4.2	Post-trade processing systems: Monte Titoli's X-TRM	255
4.2.1	Institutional framework.....	255
4.2.2	Participation.....	255
4.2.3	Types of transaction	255
4.2.4	Operation of the system.....	255
4.3	Central counterparties and clearing systems: the Cassa di Compensazione e Garanzia	256
4.3.1	Institutional framework.....	256
4.3.2	Participation.....	257
4.3.3	Types of transaction	257
4.3.4	Operation of the system.....	257
4.3.5	Risk management.....	257
4.3.6	Links to other systems	258
4.3.7	Pricing	258
4.4	Securities settlement systems (SSS): Monte Titoli's Express II.....	259
4.4.1	Institutional framework.....	259
4.4.2	Participation.....	259
4.4.3	Types of transaction	260
4.4.4	Operation of the system and cash leg process	260
4.4.5	Risk management.....	261
4.4.6	Links to other systems	261
4.4.7	Pricing	261
4.5	Use of securities infrastructure by the central bank.....	262

List of abbreviations

ABI	Associazione Bancaria Italiana Italian Banking Association
BI-COMP	Banca d'Italia Compensazione Bank of Italy Clearing System
BI-REL	Banca d'Italia Regolamento Lordo Bank of Italy real-time gross settlement system
CABI	Centro Applicativo Banca d'Italia
CAI	Interbank database on cheques and payment cards Centrale d'Allarme Interbancaria
CC&G	Cassa di Compensazione e Garanzia
CIPA	Convenzione interbancaria per i problemi dell'automazione Interbank Convention on Automation
CLFI	Consolidated Law on Financial Intermediation
CNIPA	Centro Nazionale per l'Informatica nella Pubblica Amministrazione National Centre for Information and Communication Technology in the Public Administration
CONSOB	Companies and Stock Exchange Commission Commissione Nazionale per le Società e la Borsa
CSM	Clearing and Settlement Mechanism
Digitpa	Ente nazionale per la digitalizzazione della pubblica amministrazione National Centre for Information and Communication Technology in the Public Administration
ICCREA	Istituto Centrale del Credito Cooperativo
IDEM	Italian Derivatives Market
IDEX	Italian Derivatives Energy Exchange
EBA	European Banking Association
LDT	Liquidazione dei Titoli Securities net settlement process
MTS	Mercato Telematico dei Titoli di Stato Screen-based market for government securities
RIBA	Electronic bank receipts – Ricevuta Bancaria
RNI	Rete Nazionale Interbancaria RNI National interbank network
SEPA	Single Euro Payments Area
TARGET2	Trans-European Automated Real-Time Gross Settlement Express Transfer System
TSP	Technical Service Provider

Introduction

The Italian payment system continues to evolve in response to European integration, developments in financial markets, technological innovation and initiatives launched by both public authorities and private sector bodies.

Changes to the institutional framework have ensued from legislative and regulatory measures aimed at (i) strengthening the reliability of the Italian payment system; (ii) encouraging the use of new payment instruments; and (iii) aligning Italian legislation with European regulations. Legislative measures have strengthened the oversight role of the Bank of Italy originally spelled out in Article 146 of the 1993 Banking Law, which entrusted the Bank of Italy with explicit responsibilities aimed at promoting the reliability of the payment system and fostering its efficiency. The law also provided for the Bank of Italy to issue specific regulations on payment systems. Such regulations were, in fact, issued in February 2004 to set the scope of the Bank of Italy's oversight activities for payment systems, relevant infrastructures and payment instruments.

The aims of this oversight function were extended by the Legislative Decree 11/2010, which transposes the EU's Payment Services Directive, into Italian law and reformulates Article 146 of the Banking Law for consistency with the Eurosystem's Oversight Policy. The new rules extend the objectives of the oversight function to user protection, redefining its scope and providing the Bank of Italy with the instruments for administrative control.

The process of European financial integration has reshaped the interbank payment system. Large-value payments are now settled through TARGET2, launched in 2007. Following the inauguration of the Single Euro Payments Area (SEPA), Italy's retail settlement system, BI-COMP, was adapted to handle pan-European credit transfers and direct debits and made interoperable with other clearing and settlement mechanisms across borders.

The advent of SEPA has also led to changes in the institutional framework governing the provision of payment services.

Legislative Decree 11/2010 transposing the Payment Services Directive into Italian law has broadened the range of entities (payment institutions) that are authorised to provide payment services in addition to the traditional intermediaries (banks and electronic money institutions) and it has also harmonised the rules for all payment services.

With a view to strengthening confidence in advanced, non-cash instruments, the decree offers incentives for the use of secure electronic instruments (eg by allowing merchants to offer discounts to customers who use such instruments). Other measures were also issued at the European Community level, notably EC Regulation 924 of 16 September 2009 on cross-border payments within the Union, which aims to modernise retail payment services and make the euro area more competitive.

The Consolidated Law on Financial Intermediation (CLFI) (Legislative Decree No 58 of 24 February 1998) provides that settlement and custody services for securities may be carried out by private companies. Against this legal background, the central depository service is provided by Monte Titoli, which is also the operator of the securities settlement process, Express II.

The CLFI also establishes the principle that the management and organisation of regulated markets are entrepreneurial activities and entrusts the Bank of Italy with surveillance functions for regulated markets relevant to the conduct of monetary policy.

With a view to strengthening financial systems against catastrophic events and to mitigating systemic risk, the Bank of Italy has worked with the main payment system stakeholders, technical service providers, market infrastructures and banking groups to assess the Italian financial system's state of preparedness for operational crises. In this connection, the Bank of Italy has promoted an ad hoc national coordination body to develop guidelines for reducing

systemic risk factors. With a mandate to assure business continuity in the Italian financial markets, this working group, known as CODISE, is co-chaired by the Bank of Italy and the Commissione Nazionale per le Società e la Borsa (CONSOB), the Italian stock exchange commission, and involves representatives from leading banking groups and infrastructures essential to the orderly working of the financial system.

1. Institutional aspects

1.1 The general institutional framework

The Bank of Italy is mandated by law to promote the smooth operation of the payment system and it is empowered to issue regulations for that purpose. The Bank issues provisions to clarify the objectives, scope and instruments of its oversight of payment systems. Within the Eurosystem, it also contributes to analyses and proposals concerning oversight, and participates in the committees where payment system issues are discussed.

The Bank's oversight activity covers public and private payment systems, infrastructures and payment instruments especially as regards (i) completion of monetary integration; (ii) maintenance of financial stability; and (iii) promotion of technological innovation.

Supervisory responsibilities for trading and post-trading infrastructures are assigned to CONSOB, but are shared to some degree with the Bank of Italy, which has sole supervisory powers over the organised trading of interbank funds, owing to their relevance to monetary policy. CONSOB acts in a regulatory and supervisory role in regulated markets other than wholesale markets for government bonds, with the aim of ensuring market transparency, orderly trading and the protection of investors. It has also regulatory powers with regard to post-trading that are exercised in agreement with the Bank of Italy.

With the support of the Bank of Italy, the Autorità Garante della Concorrenza e del Mercato, the antitrust authority, is responsible for antitrust issues relating to payment instruments.

The regulatory framework of the Italian payment system is based on the Italian Civil Code, the 1993 Banking Law (Legislative Decree 385 of 1 September 1993) and other specific laws, including the Codified Law concerning note-issuing banks (see Codified Law 204/1910 and the Bank of Italy's Statute with reference to bank transactions negotiated or executed by the Bank of Italy).

The Bank of Italy's interest in the proper functioning of the payment system and, in particular, of interbank systems stems from its role in the implementation of monetary policy and as supervisor of the banking system. The Royal Decree of 6 May 1926 gives the Bank of Italy exclusive responsibility for managing the clearing system for interbank payments.

The 1993 Banking Law, as amended by the Legislative Decree 11/2010, entrusts the Bank of Italy with explicit responsibilities and powers aimed at promoting the efficiency and reliability of the payment system. With regard to the transparency of banking services, the 1993 Banking Law gives the Bank of Italy the power to control the way in which commercial banks deliver the information they are required to provide to customers.

In order to prevent money laundering, Law 197/1991 authorises the Bank of Italy to supervise the activities of non-banks that operate in the payment system, including intermediaries that carry out funds transfers via payment cards.

The circulation of individual paper-based payment instruments (eg cheques) and the discharge of financial obligations (eg novation and bilateral netting) are governed by the provisions of the Civil Code and other specific laws (see Royal Decree 1345 of 21 September 1933, Legislative Decree 1736 of 21 December 1933 and Legislative Decree 507 of 30 December 1999).

The regulations governing cheques and electronic money were substantially revised by Legislative Decree 231 of 21 November 2007 on the circulation of payment instruments, which transposes the EC's Third Money Laundering Directive (2005/60/EC).

To enhance the security of cheques and confidence in their use, an interbank database on irregular cheques and payment cards was established by Law No 205 of 25 June 1999 and Legislative Decree No 507 of 30 December 1999, which amended the penalties imposed for writing bad or unauthorised bank or postal cheques. The database records the names of offenders who have drawn bad cheques or written cheques without authorisation as well as details of lost and stolen cheques. It also blacklists persons whose authorisation to use payment cards has been revoked.

Legislative Decree 48 of 24 March 2011 transposed into Italian law the provisions of Directive 2009/44/EC on settlement finality, amending Directive 1998/26/EC which in turn was transposed by Decree 210 of 12 April 2001.

More specifically, this Decree abolishes the zero hour rule¹ with regard to designated payment and securities settlement systems, introduces a special regime for guarantees given to the system and includes provisions to protect participants that settle securities trades on behalf of other intermediaries. It also assigns to the Bank of Italy the responsibility for collecting necessary information and distributing it to the competent authorities when an insolvency process is initiated.

The legal framework of the retail payment system BI-COMP is governed by a Bank of Italy regulation issued in November 2005 ("Regulation concerning the oversight of low-value payment systems" dated 11 November 2005) which lays down the general principles governing the system's operation and sets out the exchange of payment instructions for transmission to the "Dettaglio" sub-system as well as the process for determining multilateral clearing balances.

As regards the "Dettaglio" sub-system, the operational role of the Bank of Italy is limited to the phase where multilateral clearing balances are determined and transmitted for settlement. The market is responsible for the preceding phases (ie exchange of instruments and activities preparatory to determining the balances).

European Regulation 924/2009/EC provides that charges for cross-border payments within the Community are the same as those for payments in the same currency within a member state. It further stipulates that all banks in the EU have to be accessible for direct debits as from 1 November 2010.

Work is under way to transpose the European E-Money Directive (2009/110/EC) into Italian legislation. The E-Money Directive amends Directive 2000/46/EC on the prudential supervision of electronic money institutions, which was transposed by the Italian Law 39 of 1 March 2002. This law empowers the Bank of Italy to define prudential supervision requirements regarding the financial stability of such institutions and also to set oversight requirements for e-money instruments and systems. The 2009 Directive introduces a clear definition of electronic money and establishes that e-money institutions may carry, in addition to issuing electronic money, other activities, such as the granting of consumer credit, or operation of payment systems and that these additional business activities are subject to new requirements in terms of capital guarantees.

The legal framework for trading and post-trading infrastructures is governed by the CLFI, which sets out regulations on (i) issuers of securities on regulated markets; (ii) financial intermediaries; and (iii) financial markets and the CSDs.

¹ The zero hour rule provided that any transactions conducted by an insolvent institution after midnight on the date that the institution is declared insolvent are void.

The CLFI assigns the management functions of financial markets to private companies and the supervisory role to public authorities. The privatisation of financial markets and CSDs is specified in the CLFI (see Articles 61, 80 and 204), while the privatisation of settlement systems, particularly SSS and clearing houses, follows from general regulations issued on the basis of the CLFI (see Articles 69 and 70).

The legal framework of CSDs is completed by means of a number of rules on financial instrument dematerialisation established at the start of economic and monetary union. Dematerialisation is compulsory for all government bonds and private listed securities, and also for such financial instruments as may be specified by CONSOB and the Bank of Italy.

1.2 The role of the central bank

The Bank of Italy is entrusted with oversight powers aimed at ensuring the efficient and reliable functioning of the payment system.

In Italy the central bank has traditionally played an important role in the direct provision of payment and settlement services with a view to enhancing the payment system's reliability and stability. The operational role of the Bank of Italy in the payment and securities settlement systems currently entails banknote issuance, the management of TARGET2 and BI-COMP, and the execution of government payments as a fiscal agent.

The Bank of Italy also supervises post-trading infrastructures and those financial and money markets that are relevant for monetary policy, ie the wholesale screen-based market for government securities, Mercato Telematico dei Titoli di Stato (MTS) and the screen-based interbank deposit market (e-MID).

1.2.1 Oversight

As mentioned above, the oversight function is assigned to the Bank of Italy by Article 146 of the 1993 Banking Law (which concerns the oversight of payment systems and implemented by means of framework guidelines issued by the Bank. These guidelines specified the aims of that oversight, setting objectives for reliability (essentially, the prevention of operational and settlement risk) and efficiency (gauged on the basis of the speed and cost of the entire money transfer cycle), covering payment systems, infrastructure services and payment instruments (both traditional and innovative).

Article 146 was reformed by Legislative Decree 11/2010, which transposed the EU Payment Services Directive (Directive 2007/64/EC), into Italian law, for consistency with the Eurosystem's Oversight Policy Framework. The decree extended the objectives of the oversight function to user protection and redefined its scope, attributing to the Bank of Italy the instruments for administrative control and recognising that the Bank of Italy shares the oversight responsibilities on payment system assigned to the Eurosystem.

In line with the framework agreed at Eurosystem level, the Bank of Italy is assigned the lead role in supervising systems and payment instrument schemes legally incorporated in Italy. The Bank reports on its oversight policies, assessments and results to the ECB's Governing Council via the ECB's committee structure.

The Bank of Italy is also responsible for the local features of the TARGET2 system; it monitors the operations and risk exposures of participants that have settlement accounts with Bank of Italy by analysing system data.

The Bank of Italy monitors the compliance of the domestic card payment scheme, Consorzio Bancomat, with the standards of the Eurosystem Oversight framework.² It also participates in the Eurosystem's assessment of the Mastercard and Visa schemes, and in the assessment of TARGET2 and EURO1 compliance with the Core Principles on Systemically Important Payment Systems.

As part of its oversight activities, the Bank of Italy has undertaken various initiatives to promote the use of more innovative payment methods. These include the evaluation of a system for electronic money transfers and the implementation of a payment card anti-fraud scheme. The latter initiative was coordinated by the Ministry of the Economy's means-of-payment Central Anti-Fraud Office.

The Bank of Italy's Market and Payment System Oversight Department has pushed for improvements in the transparency of payment service pricing and in the handling time for cheques and credit transfers. In this context, the Associazione Bancaria Italiana (ABI, the Italian Banking Association) has established the so-called PattiChiari project, through which Italian banks are encouraged to make public their business terms and conditions. Furthermore, a protocol between the ABI and the Italian Manufacturers' Association (Confindustria) has set standards for credit transfers in terms of price transparency and maximum handling time.

The oversight function of the Bank of Italy is involved in the authorisation process for Italian electronic money institutions (for which the Bank's Specialised Intermediaries Supervision Department is primarily responsible). Particular attention is paid to the security aspects of e-money, both at the national and at the Eurosystem level, where the Bank of Italy has contributed to the Electronic Money System Security Objectives (EMSSO) report on the security requirements for e-money schemes.

In 2003, the Bank of Italy issued its "Guidelines for the business continuity of systemically important payment infrastructures" following a consultation with major banking groups, financial market operators and infrastructures. Subsequently, the Committee for Business Continuity (CODISE) co-chaired by the Bank of Italy and CONSOB was set up, with a mandate to guarantee business continuity in the Italian financial markets. The working group involves representatives from leading banking groups and companies that manage infrastructure essential to the orderly working of the financial system.

To enhance its understanding of operational risks in the retail payments sector, in 2009 the Bank of Italy surveyed a significant sample of the Italian banking community on the role played by the technical service providers (TSPs) of financial intermediaries in retail payment systems. The aim was to gain insights into the role of TSPs in the retail payments sector and the perceived risks of outsourcing to them the handling of retail transactions.

The oversight function monitors the operations and risk management capabilities of the two "quasi-clearing and settlement systems" that manage the retail payments of cooperative banks (Istituto Centrale del Credito Cooperativo-ICCREA and Cassa Centrale Raiffeisen). The oversight function participates in the Eurosystem's oversight activity on correspondent banking, which is carried out through a biannual survey that also includes major Italian banks.

² According to the Eurosystem Oversight framework for card payment schemes, each card payment scheme should: have a sound legal basis under all relevant jurisdictions (Standard 1); ensure that comprehensive information, including appropriate information on financial risks, is available to all actors (Standard 2); ensure an adequate degree of security, operational reliability and business continuity (Standard 3); implement effective, accountable and transparent governance arrangements (Standard 4); and manage and contain financial risks in relation to the clearing and settlement process (Standard 5).

In response to the July 2009 initiative of the G8 to lower the cost of remittances sent by immigrants to their home countries, the Bank of Italy, together with the World Bank, supported the launch of a website that allows the prices charged by money transfer companies and other operators to be compared.

According to the CLFI, the Bank of Italy has both regulatory and supervisory responsibilities for infrastructure (ie CSDs, SSS and clearing houses), as well as the authority to carry out on-site inspections and impose penalties. The Bank of Italy also supervises companies that own or manage settlement systems. Finally, with reference to trading infrastructures, the CLFI assigns the Bank of Italy a supervisory role in markets that are relevant to monetary policy (ie MTS, the wholesale screen-based market for government securities, and the screen-based interbank deposit market e-MID).

The Bank of Italy communicates its policy stance for the oversight function by disclosing its intervention plans and methods to market participants (ie financial intermediaries, service providers and market infrastructures). It keeps the public informed of its activities through its Report to Parliament and the Government – which is submitted annually pursuant to Law 262/2005 (as amended by Legislative Decree 303/2006) – as well as through its annual report, economic bulletins and website.

1.2.2 Provision of payment and settlement services

The Bank of Italy's role in payment and securities settlement systems comprises the issuance of banknotes, the management of the pan-European system TARGET2 – jointly with the Deutsche Bundesbank and the Bank of France on behalf of the Eurosystem – the management of the BI-COMP net retail system and the management of government payments as a fiscal agent. The Bank's role as fiscal agent involves the execution of all payment orders issued by central government bodies, and the collection of all amounts due to the central government.

Following the ECB's March 2007 decision to implement a single European facility for securities settlement in central bank money, the Bank of Italy together with the Deutsche Bundesbank, the Bank of Spain, the Bank of France initiated the TARGET2 Securities (T2S) project.

Under the standard terms and conditions of the Eurosystem Reserve Management Services (ERMS), the Bank of Italy provides a gateway for correspondents to access TARGET2; it is also set to develop a number of services for cash and reserves management, securities custody and portfolio management.

1.2.3 Cooperation with other institutions

The oversight activities of the Bank of Italy are often performed in cooperation with other authorities.

As regards relations with other national authorities, the oversight function analyses the payment system market and provides any necessary support to the Antitrust Authority on antitrust issues relating to payment instruments.

At the international level, the Bank of Italy contributes to cooperative oversight of the multi-currency Continuous Linked Settlement (CLS) system for foreign exchange, within the CLS Oversight Committee (OC) which is chaired by the Federal Reserve.

The Bank of Italy also participates in the SWIFT Cooperative Oversight Group (OG), which is the forum through which the G10 central banks and the ECB conduct their oversight of the global provider of financial messaging services.

The Bank of Italy shares its responsibilities for market supervision with CONSOB as regards clearing, guarantee, settlement and central depository systems for financial instruments (the

so-called post-trading infrastructures) and markets relevant to monetary policy. The Bank of Italy has regulatory powers with regard to post-trading that are exercised in agreement with CONSOB.

Following the merger of the Borsa Italiana with the London Stock Exchange Group, the Bank of Italy, jointly with CONSOB, signed a memorandum of understanding with the UK's Financial Services Authority (FSA) that governs the cooperation and the exchange of information between the three authorities.

The Bank of Italy also cooperates with the French supervisory authorities with reference to the link in the Italian secondary government bond market, MTS, between the Cassa Compensazione and Garanzia and the French central counterparty, LCH.Clearnet SA.

1.3 The role of other private and public sector bodies

The main providers of payment services are the banking system, the Italian Post Office and the Bank of Italy. In accordance with the 1993 Banking Law, banking activity consists in deposit collection on a public basis and the granting of credit. It is restricted to credit institutions, which are also authorised to carry out other activities subject to mutual recognition throughout the European Union (under Directive 2000/12/EC of 20 March 2000), notably the issue and management of payment instruments. As a result of merger activities, the number of banks has fallen significantly (from 1,064 in 1990 to 760 in 2010). At the end of 2010, there were 33,640 branches. The number of foreign banks stood at 75, with 296 branches.

Since February 1998, the Post Office has been a private company owned by the Ministry of the Treasury. It plays an important role in the field of retail payments. After growing rapidly in recent years, postal bank payment services now compete with those of the banking system. The bank and postal systems are deeply integrated: postal and bank cheques have been mutually accepted since July 2002, and the Post Office has been involved in low-value credit transfer processing since April 2000. Its banking and financial activities are regulated by Presidential Decree 144 enacted in May 2001, which places the Post Office under the same supervisory regime as banking and financial intermediaries.

According to Article 114–6 of the Banking Law (as amended by the Legislative Decree 11/2010), payment services may also be provided by e-money institutions and the newly defined payment institutions, as well as by traditional banking intermediaries.

1.3.1 The Italian Banking Association

As the banking system's representative body, the ABI is responsible for coordinating interbank agreements and establishing uniform interbank operational and accounting methods. It promotes, in conjunction with the Bank of Italy, the broadest possible participation in interbank initiatives and the dissemination of information. The ABI participates in the SEPA, the migration programme for which is monitored by the Bank of Italy.

1.3.2 The Interbank Convention on Automation

The Interbank Convention on Automation (CIPA) is tasked with planning initiatives for interbank communications systems and applications. It also coordinates the implementation of joint projects, particularly within the payment system. The CIPA comprises the Bank of Italy, which acts as chair and provides the secretariat, the ABI, 69 banks, and 11 other organisations and companies active in the interbank automation field.

1.3.3 National Centre for Information and Communication Technology in the Public Administration

The National Centre for Information and Communication Technology in the Public Administration (Ente nazionale per la digitalizzazione della pubblica amministrazione – Digitpa), works to implement the policy guidelines set out by the Ministry of Innovation and Technology. The Bank of Italy works together with this authority, in accordance with the role assigned to the Bank of Italy by Presidential Decree No 137 of 7 April 2003, in laying down the rules for electronic funds transfers between private parties, between government bodies, and between the latter and the former.

1.3.4 The main interbank service providers

SIA is one of the most important Italian service providers. It provides network services and interbank applications and technological platforms for banking and financial intermediaries and markets. It also provides clearing services for retail payments settled in BI-COMP and handles debit and credit cards. At the beginning of 2000 the Bank of Italy ended its participation in SIA, which in 1999 had merged with CEDBorsa (a software company which managed stock exchange trading systems), thereby consolidating the management of IT systems for market and settlement systems. SIA is also the service provider for the infrastructure of the STEP2 system, which is owned and managed by the European Banking Association (EBA). In 2007 it merged with another infrastructure service provider (SSB), which is active in card processing.

1.3.5 Monte Titoli

Monte Titoli is a company that offers the central custody and administration of transferable securities (shares and bonds), as well as securities settlement services. Since December 2002, Monte Titoli has been part of the Borsa Italiana Group, which merged into the London Stock Exchange Group in 2007.

In 1986, Law no 289/86, governing Monte Titoli's activity in private securities, established that this CSD was the only company authorised to administer private securities. But, from 1998, following the implementation of the CLFI, Monte Titoli was no longer considered to have a monopoly, as the new law invoked the principles of privatisation and liberalisation with a view to increasing competition (see Article 80 of the CLFI).

In August 2000, Monte Titoli was authorised to manage government bonds, which until then had been managed by the Bank of Italy; the actual transfer of government securities from the Bank of Italy to Monte Titoli took place at the end of 2000. Thus, both private and government securities are now managed by a single Italian CSD.

Dematerialisation has increased the importance of the CSD, as title to securities is now authenticated by means of book entry. In October 2000 Monte Titoli was authorised to operate the Express RTGS system, which started operating in parallel with the Liquidazione dei Titoli (LDT) process. However, LDT has since been replaced by the new Express II clearing and settlement system (see Section 4.3.1) introduced by Monte Titoli in January 2004. Monte Titoli also operates the daily matching correction system X-TRM, which manages the matching of transactions and the routing of matched transactions to the settlement services. The X-TRM system also establishes the bilateral balances between the CCPs participating in the SSS (Cassa di Compensazione e Garanzia (CC&G) and LCH.Clearnet; see Section 4.2.2) and their counterparts, and sends these balances to the settlement services.

In August 1998 the ECB included Monte Titoli in the list of securities settlement systems meeting the standards set by the European Monetary Institute (EMI) for the credit operations of the European System of Central Banks (ESCB).

1.3.6 The Cassa di Compensazione e Garanzia

The CC&G acts as a central counterparty. The company is controlled by London Stock Exchange Group. The activity of CC&G, originally restricted to derivative financial instruments, also extends to the stock market, for which a central counterparty is mandatory, and to the markets for Italian government securities, where it is optional.

1.3.7 The Companies and Stock Exchange Commission

CONSOB plays a regulatory and supervisory role in regulated markets other than the wholesale markets for government bonds. It seeks to ensure the transparency of markets, orderly trading and the protection of investors. It is also vested with regulatory and supervisory powers on guarantee, settlement and central depository systems.

In accordance with the CLFI, CONSOB may give authorisation to market management companies that fulfil certain requirements (see Article 63). It also plays a supervisory role in regulated markets and market management companies (see Articles 73 and 74). In the event of serious irregularities in the management of markets or in the administration of management companies, and wherever it is necessary for the protection of investors, CONSOB can adopt extraordinary measures to protect markets and management companies (see Article 75).

1.3.8 The market management companies

Market management companies have a number of regulatory and supervisory responsibilities. In accordance with the CLFI (see Article 64), market management companies must (i) provide the structures and services necessary for the proper functioning of the market; (ii) manage the market from an operational point of view; (iii) be responsible for permitting, precluding or suspending trading for given intermediaries and financial instruments; and (iv) ensure compliance with any rules contained in insider trading laws (eg as regards the registration of operations and the distribution of relevant information subject to public disclosure requirements).

2. Payment media used by non-banks

2.1 Cash payments

Since the introduction of the euro, legal tender in circulation in Italy comprises euro banknotes and coins. At the end of 2010, the amount of cash in circulation as a percentage of GDP was 9.3% (7.2% in 2006). The use of cash is still predominant: it has been estimated that in 2010 cash accounted for about 90% of all micropayments.

At the end of 2010, the ratio of the stock of currency in circulation to M1 was 15% (14% at the end of 2006).

However, the use of cash is on the decline for retail purchases, which is consistent with the spread of payment cards and other electronic means of payment. This trend is confirmed by the Bank of Italy's latest sample survey on Household Income and Wealth (referring to

2010),³ which found that households' average monthly cash outlays had fallen to 44% of their total expenditure, from about 48% in 2006.⁴

2.2 Non-cash payments

In 2010, 66 transactions per capita were made using instruments other than cash (62 in 2006). They were made mainly by means of payment cards and credit transfers (respectively 27 and 20 transactions per capita in 2010; 22 and 18 in 2006), with an average value of around EUR 79 and EUR 6,000, respectively. Payment cards account for 40% of the total payments executed using instruments other than cash, showing an increase in recent years (from 35% in 2006).

The diffusion of payment instruments is quite diverse at a regional level: in southern Italy cards are much less used than in the north (16 versus 37 transactions per capita in 2010).

According to the above-mentioned sample survey on Household Income and Wealth, about 85% of Italian households have a current account. Again, this average figure conceals a considerable gap between northern (96%) and southern Italy (67%).

2.2.1 Non-cash payment instruments

2.2.1.1 Credit transfers

In Italy, credit transfers are one of the most popular payment methods. They are widely used for retail transactions (eg the direct crediting of wages, salaries and pensions). In 2010, credit transfers amounted to EUR 7,938 billion (6,222 billion in 2006) in total value, with the number of transactions reaching 1,227 million (1,070 million in 2006).

Credit transfers are settled via two channels, BI-COMP and STEP2.

BI-COMP settles credit transfers with a value of less than EUR 500,000 through its retail subsystem; transactions with a value of more than that threshold are settled through TARGET2. Through BI-COMP, clearing system participants clear their credit and debit positions and transmit any outstanding multilateral balance to the TARGET2 system for settlement (see Section 3).

The BI-COMP clearing system manages domestic and SEPA credit transfers (SCTs). In 2010, some 6.3 million SEPA credit transfers were settled through BI-COMP, representing 1.7% of the total handled by the clearing and settlement system. This figure includes credit transfers transmitted by BI-COMP to the two mechanisms with which it has interoperability arrangements (Equens in the Netherlands and STEP.AT in Austria).

In 2010, STEP2, the pan-European automated clearing house (PE-ACH) for bulk payments in euros, settled 72% of the SCTs ordered by Italian banks. STEP2 processes credit transfers that comply with the convention on credit transfers in euros, ie retail payments of up to EUR 50,000 per transaction.

Convergence on the new SEPA pan-European standards, which began in January 2008 for credit transfers, is proceeding slowly, but there have been some encouraging signs: in Italy, in 2010 the pace of migration to the SEPA-standard credit transfer (SCT) accelerated from 1% in 2009 to 6%.

³ See Bank of Italy, *Household Income and Wealth in 2010, Supplement to the Statistical Bulletin*, Rome, 25 January 2012.

⁴ The cash portion of household consumer spending is highest in the south, among the less-educated and in poorer households.

2.2.1.2 Collection orders (direct debits and bank receipts)

Collection orders are executed by banks. They are originated by creditors and may be executed by debtors via various payment methods: direct debits are carried out by means of pre-authorised debits of payers' current accounts; collections of bank receipts are executed through other payment methods.

Direct debits are used mainly by firms and families to collect recurrent low-value payments (eg utility bills). In 2010, 593 million direct debits were made (480 million in 2006) for a total value of EUR 365 billion (EUR 299 billion in 2006).

Bank receipts used by firms to collect trade and other credits are processed via an electronic bank process (*Ricevuta Bancaria* or RIBA).⁵ RIBA's share of total collection order transactions fell from 39% in 2006 to 28% in 2010.

The new SEPA direct debit schemes (SEPA Direct Debit) became operational in November 2009. From November 2010, they have been effectively mandatory for all institutions already offering similar domestic debit services.

2.2.1.3 Bank cheques and banker's drafts

The number of cheque transactions has fallen significantly in recent years. In 2010, 315 million cheque transactions were cleared (453 million in 2006), with a total value of EUR 842 billion (EUR 1,191 billion in 2006). From 2009 to 2010, the number of cheque transactions and their corresponding value decreased by a respective 6% and 7%. In 2010, cheques accounted for 8% of the total value of cashless transactions (14% in 2006). The marked decline is explained by the restrictions on cheque usage that were introduced by decree in 2008 to counter money-laundering. Since 2008, cheques must now be non-negotiable, except in a few cases such as the option, if formally requested, of using a bank draft for amounts of less than EUR 5,000.

Low-value cheques (of up to EUR 5,000) and bank drafts are cleared through a truncation process based on electronic interbank messages in place of physical delivery. The BI-COMP local clearing subsystem clears paper-based cheques.

In addition, the Bank of Italy also issues cashier's cheques for amounts of between EUR 500 and EUR 500,000, against cash payments for the corresponding amount. This instrument is also used for certain non-recurring payments carried out by the central bank on behalf of public entities (eg tax refunds and severance pay to central government employees).

The use of such methods has declined with the increasing use of electronic payment orders to make government payments. The electronic order process was launched in 1999 with the aim of promoting the use of credit transfers to make government payments while cutting down on paper-based documentation. In 2010, about 98% of all government payments were made electronically. In the same year, the Bank of Italy issued around 315,000 cashier's cheques (compared with about 514,000 in 2006) for a total value of EUR 3,106 million (EUR 6,511 million in 2006).

2.2.1.4 Payment cards

Efforts to promote the use of secure chip technology in payment cards accelerated in 2009 and in 2010. More than half the cards in circulation in Italy and about 85% of the country's ATM and POS terminals now comply with the standard. The replacement of magnetic stripe

⁵ From a statistical point of view the RIBA is classified under "other payments" in the ECB statistics since it does not represent a typical credit transfer or direct debit; the RIBA is a payment initiated by the payee without a preauthorisation under a payer's mandate.

with chip technology has helped significantly in combating fraud, as have effective preventive measures by intermediaries and special incentives for operators. Intelligent pricing by intermediaries can also encourage the wider take-up of electronic payment methods. In Italy, as elsewhere, payment card fees have come down in recent years.

Debit cards

In 2010, about 37 million debit cards were in circulation, showing a slight increase over 2006 (1.5%). Almost all these cards can be used to execute both payments and cash withdrawals through the nationwide network of POS terminals and ATMs.

From 2006 to 2010, the number of debit card transactions increased by 14% (from 1,501 million to 1,704 million), thanks to the growing use of debit cards at POS terminals (up by 19%). The number of transactions at POS terminals per card rose from 22 in 2006 to 25 in 2010, while the number of withdrawals from ATMs increased by 8%. At the same time, the average value of each POS terminal transaction fell by 25% (EUR 93 in 2006; EUR 69 in 2010), while the average value of each ATM withdrawal rose slightly (from EUR 168 in 2006 to EUR 180 in 2010).

PagoBANCOMAT and BANCOMAT are the major nationwide debit card networks respectively for POS terminals and for ATMs. These systems provide a common infrastructure and a common set of rules and standards under a single trademark. The BANCOMAT consortium is responsible for organising and operating network facilities.⁶ At the end of 2010, some 568 banks participated in the consortium.

Payments and withdrawals with debit cards are debited to the holder's account almost in real time. This means that holders must have the value of the purchase or the amount of the withdrawal on their account when the debit card is used. ATM transactions are processed through the retail subsystem and settled via BI-COMP.

Credit cards

In 2010, some 34 million credit cards were in use in Italy (31 million in 2006), but only 43% were used at least once over the year (48% in 2006). In 2010, the number of transactions totalled 588 million (475 million in 2006), representing an average of 17 transactions per credit card (15 transactions in 2006).

Despite this recent increase in credit card circulation, credit cards are still less widely used in Italy than in other European countries. More widespread usage is limited by a continuing preference for cash and the use of debit cards at POS terminals.

In 2010, credit card expenditure accounted for 2.2% of per capita GDP, less than half the share held by ATM cash withdrawals (5.5%) and roughly equal to the share held by debit card POS expenditure (2.5%). In addition, even though cards are now accepted at an increasing number of outlets (especially in the retail sector), gaps in coverage persist in various Italian regions. Some retailers continue to be deterred by card commission charges and the work involved in authorising and processing payments.

The major nationwide credit card network (in both the issuer's and the acquirer's markets) is Carta Si SPA with around 800 participating banks. The network is linked to both Visa and Mastercard. A growing number of individual banks have launched proprietary cards directly linked to the international labels.

⁶ In 2008, the former Convention for the Management of the Bancomat Trademark (COGEBAN) became the BANCOMAT consortium. ABI founded COGEBAN in 1985 to foster the use of debit cards in Italy. BANCOMAT manages both the BANCOMAT and PagoBANCOMAT systems and owns the related trademarks.

E-money and card payments over the internet

Online transactions have expanded at very rapid rates in recent years, although they still account for only about 6% of all cashless payments. During 2010 they increased by 24%, which included growth of 24% in online credit transfers, 15% in online transactions using credit cards and 33% in those using pre-paid cards.

The number of prepaid cards in circulation has grown considerably in the last five years (from 4.5 million in 2006 to 12.4 million in 2010). Online transactions via prepaid cards accounted for about half of total prepaid card transactions in 2010.

A survey in 2009 found that a variety of economic agents are interested in the development of mobile payments for small amounts (micropayments). Remote services (via text messaging, for instance, or mobile internet applications) are expected to grow rapidly, as are contactless payment services at a later stage. An additional impetus for the development of such services will come from the eventual transposition of the new EU electronic money directive into national legislation.

2.2.2 Non-cash payment terminals

At the end of 2010, there were 51,360 ATMs (43,820 at the end of 2006) and 1.5 million POS terminals (1.1 million in 2006). In recent years, the annual number of transactions per POS terminal has increased significantly (from 690 in 2006 to 1,083 in 2010), but usage is still limited in comparison with that of other industrialised countries and with the transaction volume of domestic ATMs.

Over 90% of ATMs are interconnected within the nationwide BANCORMAT network. Most POS terminals are linked to the PagoBANCORMAT network. Membership is open to any bank located in Italy that complies with the rules of the BANCORMAT consortium.

2.2.3 Recent developments

The new European regulatory framework on retail payments calls for a strategy to promote the use of cashless instruments and displace the use of cash, which continues to be a favoured medium of payment.

The Bank of Italy, together with the banking and financial community, is making special efforts in this direction. To this end, the Bank of Italy launched a survey on the costs of retail payments in 2009 with the aim of enhancing the general understanding of the cost efficiency of different payment instruments.

The transposition of the Payment Services Directive (PSD) into Italian law broadened, among other things, the range of entities (payment institutions) authorised to provide payment services in addition to the traditional intermediaries (banks and electronic money institutions). It also harmonised the rules for all payment services, speeding up the adoption of SEPA payment instruments (ie SEPA credit transfers and SEPA direct debits).

The SEPA project, launched in 2002 at the initiative of European banks, will increase the efficiency of payments within the EU and foster innovation. The migration to SEPA involves a wide range of participants: central banks, commercial banks, public administration, firms and consumers.⁷

⁷ The National SEPA Migration Committee is an ad-hoc organisation established in 2007 to guide and monitor the implementation of SEPA. Co-chaired by the Italian Bankers' Association (ABI) and the Bank of Italy, it includes representatives from the main categories of final users of payment instruments (corporates, public administration, merchants and consumers).

The Bank of Italy, in cooperation with ABI, is already disseminating information on the implications of SEPA for the domestic payments system. As the provider of treasury services to the Italian government, the Bank of Italy is working with the Ministry of the Economy to adapt public payments to European standards. The first initiatives were taken in January 2008.

An additional boost to the automation of payment cycles has come from measures by the Italian government to bar public entities from accepting paper-based invoices. This move will also encourage government departments to use IT more intensively, as well as promote accounting transparency and up-to-date business practices.

2.2.4 Interchange fee regulation

The European regulatory framework established by the PSD brings important changes to the regulation of national interchange fees. The transposition into national law of the PSD provisions on surcharging has resulted in a ban on surcharges. As stated by the Directive, the ban was introduced in order to take “into account the need to encourage competition and promote the use of efficient payment instruments”.⁸

3. Payment systems (funds transfer systems)

3.1 General overview

Following two far-reaching reforms implemented in the 1980s and 1990s with a view to promoting settlement in central bank money by reducing recourse to correspondent accounts, boosting the efficiency of payment instruments and mitigating systemic risk, the Italian interbank payment system comprises two specialised systems: an RTGS system for large-value payments and a net system, BI-COMP, for retail transactions.

The first RTGS system, known as BI-REL, went live in 1997, with the aim of reducing systemic risk; in 1999 BI-REL became the Italian component of TARGET, the Eurosystem’s large-value gross settlement system. A second-generation version of BI-REL – designed for more efficient and economical management of intraday liquidity – was launched in 2003. Finally, in 2008, the BI-REL system was replaced by TARGET2, the second-generation iteration of TARGET.

Following the launch of the SEPA, the BI-COMP net retail settlement system was made interoperable with other clearing systems across borders so that it could handle pan-European credit transfers and direct debits.

3.2 Large-value payment systems

Please refer to the descriptive Red Book chapter on the euro area.

⁸ According to the PSD, “In order to promote transparency and competition, the payment service provider should not prevent the payee from requesting a charge from the payer for using a specific payment instrument. While the payee should be free to levy charges for the use of a certain payment instrument, Member States may decide whether they forbid or limit any such practice where, in their view, this may be warranted in view of abusive pricing or pricing which may have a negative impact on the use of a certain payment instrument taking into account the need to encourage competition and the use of efficient payment instruments.”

3.3 Retail payment systems

3.3.1 Institutional framework

The Bank of Italy manages the multilateral clearing and settlement component (BI-COMP) of the Italian retail payment system, which enables settlement in central bank money of euro retail payments using both electronic and paper-based instruments. The BI-COMP system consists of the local clearing and the retail subsystems and of the National Clearing Process. The local clearing subsystem performs the multilateral clearing of paper-based payments. The retail subsystem performs the multilateral clearing of electronic payments handled in an interbank process. The multilateral balances of each participant in the two subsystems are transmitted to the National Clearing process and contribute to the overall national multilateral balance, which is submitted for settlement in TARGET2. In 2010, the BI-COMP system settled 2 billion payments with a total value of about EUR 3,000 billion.

The current regulatory framework for the clearing and settlement of low-value electronic payments in Italy, which in 2010 represented 97.5% of the total retail payments in BI-COMP, is set out in a Provision of the Governor of Bank of Italy of November 2005. On this basis, “Assigned operators” conduct the activities preparatory to the multilateral clearing of electronic payments, while the operating activities of Bank of Italy are limited to calculating the multilateral clearing balances and their transmission for settlement in TARGET2. From a European perspective the Italian retail payment system can be regarded as a clearing and settlement mechanism (CSM) featuring the joint conduct of clearing and settlement activities by two different entities, namely (i) the “assigned operator” in charge of the clearing phase (CM); and (ii) the Bank of Italy (BI-COMP) which is responsible for the settlement phase (SM). At present there are three CSMs in Italy: SIASSB-BICOMP, ICBPI-BICOMP and ICCREA-BICOMP.

In compliance with the SEPA requirements⁹ for infrastructures, the multilateral CSM ICBPI-BICOMP is able to interact – according to the EACHA¹⁰ model – with other infrastructures processing retail payments in the euro area. At present, the system is linked with the Austrian STEP.AT system and the Netherlands’ EQUENS-SE. In 2010, some 313,000 payments with a value of EUR 1.8 billion were processed through these links. The Bank of Italy also offers an intermediation service to the STEP2 system managed by EBA Clearing so that SEPA cross-border payments can be executed with participants in that system.

3.3.2 Participation

The following entities can participate in BI-COMP: central banks, domestic and foreign banks, technical infrastructures providing clearing and/or settlement services, treasuries or equivalent bodies of central and/or regional governments of EU member states or public sector bodies.

3.3.3 Types of transaction

The local clearing subsystem handles paper-based transactions between participants, such as bills of exchange, money orders, cashier’s cheques, bank cheques, postal cheques, invoices, receipts and market paper. In 2010, the local clearing subsystem handled 51 million paper-based transactions with a total value of about EUR 1.5 billion. The retail subsystem

⁹ The four criteria set out by the Eurosystem for the SEPA compliance of infrastructures are: processing capability, interoperability, accessibility and choice for banks (Fifth Progress Report on SEPA, 20 July 2007).

¹⁰ The European Automated Clearing House Association, which has set technical standards for CSM interconnection.

handles electronic operations that include a set of specific and standardised (interbank) processes for different payment types. These include national and SEPA credit transfers,¹¹ national and SEPA direct debits¹² (Core and B2B), debit card operations (ATM and POS) and cheque truncations. In 2010, the retail subsystem handled 1.9 billion payments with a total value of about EUR 2.7 billion.

3.3.4 Operation of the system and settlement process

For paper-based payments, the physical exchange of the documents (items) takes place in the Rome and Milan clearing houses. The accounting information is sent via the national interbank network, the Rete Nazionale Interbancaria (RNI), to the local clearing subsystem for the multilateral balance of each participant to be determined. Payments that do not entail the physical exchange of documents are submitted to the electronic interbank process. The CMs calculate for each process and each participant the net bilateral balances and send this information – via RNI – to the retail subsystem in which the multilateral balance is calculated and then transmitted to the National Clearing Process. In the National Clearing Process, the retail subsystem multilateral balance is added to the local clearing subsystem multilateral balance so that a final position for settlement in TARGET2 can be determined for each participant.

3.3.5 Risk management

BI-COMP is compliant with the ESCB's security standards for retail payment systems. In the event of a participant default, an unwinding process is activated that proceeds from the calculation of bilateral balances. The process then isolates and removes the positions of the defaulting participant and calculates new bilateral balances *vis-à-vis* all other participants in order to allow settlement. To discourage delays in the settlement of the clearing systems, any participant (bank) that cannot settle its multilateral balances on time is penalised (if settlement is delayed by more than 10 minutes).

3.3.6 Pricing

The annual fee paid by direct participants for BI-COMP's settlement service is calculated on the cost recovery principle. In addition, a unit fee is charged for each paper-based item presented to the local clearing subsystem. As regards clearing services provided by assigned operators, the fee structure usually varies according to the type of payment instrument used and is published on each operator's website.

3.3.7 Major ongoing and future projects

The Bank of Italy continues to conform the retail payments system to the Eurosystem requirements for SEPA infrastructures. In addition, the Bank of Italy is at the planning stage for the Centro Applicativo Banca d'Italia (CABI) project, which will allow the Bank to execute all the activities preparatory to the clearing of electronic payments. In effect, this will give the Bank of Italy the capability to operate a CSM in its own right. CABI should start operations by the end of 2011.

¹¹ Since 28 January 2008.

¹² Since 1 November 2009.

4. Systems for post-trade processing, clearing and securities settlement

4.1 General overview

As the CSD through which title to securities is transferred by book entry to the accounts of market participants, the Monte Titoli is responsible for the overall efficiency of the clearing and settlement systems and hence of the Italian securities market.

Trades pending settlement may be backed by a guarantee of final settlement provided by a central counterparty, the Cassa Compensazione e Garanzia (CC&G), at the time of the original transaction.

The Express II securities settlement system provides settlement services on either a gross (transaction by transaction) or net basis (settlement of the balance resulting from the clearing of transactions).

4.2 Post-trade processing systems: Monte Titoli's X-TRM

4.2.1 Institutional framework

Trade confirmation systems are governed by a general regulation issued by the Bank of Italy with the agreement of CONSOB (see the legal provision of 24 December 2010 on the clearing and settlement of transactions involving non-derivative instruments under the CLFI Article 69).

The only trade confirmation system currently in operation in Italy is the X-TRM system, operated by Monte Titoli. This system daily matches and routes both exchange-traded and OTC transactions to central counterparties (CCPs) and settlement services.

4.2.2 Participation

Participation requirements are set out by the relevant security settlement system and/or by the relevant CCP guarantee system. With respect to Italian systems, see Sections 4.3.1.2 and 4.4.1.2 below.

4.2.3 Types of transaction

The X-TRM system manages a wide range of post-trade activities, including the management of settlement instructions, the enhancement and validation of settlement information, the calculation of net balances, the routing of settlement instructions, the management of corporate actions on failing trades and full reporting. The X-TRM system also establishes the bilateral balances between CC&G and LCH.Clearnet SA, the two CCPs participating in the security settlement system, and their counterparties, and sends this information to the settlement services. As part of the London Stock Exchange Group since 2007, Monte Titoli has extended its X-TRM process for matching and addressing contracts to the London Stock Exchange's International Order Book segment and its Electronic Order Book for the UK Retail Bond Market segment.

4.2.4 Operation of the system

The X-TRM system manages the submission of contracts for settlement, on the schedules agreed by intermediaries.

The X-TRM system is available on TARGET business days. Its operating times take into account the operating times of the other systems with which it interacts, ie:

- the gross and the net security settlement system;
- the gross cash settlement system (TARGET2).

Transactions subject to deferred settlement may be matched and routed throughout the X-TRM system's business day (07:00–22:30) and transmitted in the early hours of the settlement day. Transactions subject to immediate settlement are immediately matched and routed by the X-TRM system and transmitted before the settlement system's closing time.

For contracts already in the X-TRM system, the transactions to be cleared are batch-processed on the night before the clearing date. Contracts entered in the X-TRM system with a settlement date on the following day are executed up until the X-TRM system's cut-off time.

The X-TRM system sends instructions to the Express II net settlement process in the form of (i) individual contracts; (ii) bilateral balances from the netting process and forwarded to the X-TRM system; and (iii) bilateral balances from the aggregation of contracts via the intermediation of a CCP, which are automatically calculated by the X-TRM system. This latter process determines the net securities-cash exposure for each participant against the CCP and the general clearing member, as applicable.

Fails and transactions not settled at the end of the Express II net security settlement daytime cycle are transmitted to the X-TRM system and forwarded to the gross settlement process.

The X-TRM system also sends settlement instructions on exchange-traded and OTC transactions to systems other than Express II, currently Euroclear Bank and Clearstream Luxembourg. Intermediaries can execute trades through a foreign settlement system in which they may or may not participate. In the latter case, the settlement is possible through the bridge connecting the two foreign settlement systems.

Participants pay an admission fee on joining and then unit fees on each transaction automatically acquired or manually entered (or cancelled) for matching and routing for domestic settlement. Transactions processed for settlement abroad are subject to additional fees to cover SWIFT charges.

4.3 Central counterparties and clearing systems: the Cassa di Compensazione e Garanzia

4.3.1 Institutional framework

The general framework for guarantee systems is established by a general regulation issued by the Bank of Italy, with the agreement of CONSOB (see the legal provision of 24 December 2010 on the guarantee systems for transactions involving financial instruments under Articles 68, 69.2 and 70 of the CLFI). The operating rules of the clearing house are approved by the Bank of Italy in agreement with CONSOB after verification that:

- the clearing house fulfils certain requirements (a minimum capital level, as well as rules on accounting and organisational segregation); and
- the company's operational rules comply with official regulations and will assure the system's efficiency, soundness and stability.

The approval of managerial appointments at the clearing house is subject to legal and professional requirements that are set by the Ministry of the Economy and Finance.

Regulation on clearing house services covers risk containment measures, such as the collection of initial margins and, where necessary, intraday margins, as well as the monitoring of members' daily exposures.

CC&G manages the CCP guarantee system in Italy. The CC&G is a company owned by Borsa Italiana and since 2007, after the acquisition by the London Stock Exchange, has formed part of the London Stock Exchange Group.

4.3.2 Participation

The CC&G's operating rules provide for membership as either a clearing or a non-clearing member.

A clearing member becomes a counterparty to the CC&G. Clearing members are either individual (ICMs) or general clearing members (GCMs). ICMs may clear their own and customers' transactions, whereas GCMs, in addition to proprietary and customer transactions, also clear the contracts of non-clearing members. A non-clearing member (NCM) does not become a CC&G counterparty.

NCMs must be market members and must sign an agreement with a GCM. It is possible for both resident and non-resident institutions to become members of the CC&G. Members include:

- EU and non-EU banks and investment firms authorised to provide investment services in Italy;
- banks and investment firms that provide investment services in Italy subject to mutual recognition;
- other members of the markets guaranteed by the CC&G which, as NCMs, have signed an agreement with a GCM; and
- other entities, such as the Ministry of the Economy and Finance and legal persons, including non-Italian entities, that manage other central counterparty guarantee systems (as special clearing members).

In the course of 2009, the total number of clearing members was 144. At the end of 2009 the Italian Derivatives Market IDEM derivatives segment had 80 participants, the MTA electronic share market 115, the bond segment 21 and IDEX, the Italian derivatives energy exchange and energy futures market 22.

4.3.3 Types of transaction

The CC&G acts as CCP for: (i) the equity and derivatives markets operated by Borsa Italiana; and (ii) the markets regulated and managed by MTS SpA and BrokerTec (exclusively for Italian government bonds).

In 2009, the CC&G introduced a function in IDEX that allows traders to take physical delivery in lieu of cash settlement of the price difference at the expiry of futures contracts.

4.3.4 Operation of the system

The CC&G takes on the counterparty risk from the moment of contract execution, acting as the buyer to every seller and as the seller to every buyer, and guaranteeing final settlement.

The CC&G's activities include forcible execution of contracts that are not settled for lack of securities (buy-ins) or for lack of liquidity (sell-outs) to guarantee the successful completion of transactions when they reach the expiry date set by the market.

4.3.5 Risk management

The CC&G's risk management system is based on multiple levels of protection, which include margins, three default funds and capital requirements for members.

The CC&G monitors clearing members' positions in real time. Initial margins are called on a daily basis to cover the liquidation costs that the CC&G would incur in the event of a member's default if it were forced to close the open positions in the worst possible market scenario, within a maximum price variation range known as the "margin interval". The margin interval, specific for each financial instrument, is periodically reviewed.

Initial margins can be placed in cash (euros) or in euro-denominated securities, which can be MTS-traded Italian, French or German government bonds. Government bonds are marked to market daily at the weighted average MTS market price. Italian government bonds deposited as collateral are grouped in classes of haircut based on their duration; French and German government bonds are grouped according to their time to maturity.

Intraday margins are called by CC&G in the event of sudden sharp price variations or a member's excessive overall risk exposure. Intraday margin is calculated according to the same methodology as the initial margin. Intraday margins must also be deposited in cash (in euros).

The central counterparty service for MTS, provided jointly with LCH.Clearnet SA, contributed about 30% of total margins deposited in 2009. In November 2009, the service was extended to overnight repos, which raised the share of MTS margins in the total to about 50% at the end of the year.

Three default funds exist: one each for the equities and derivatives markets, the energy derivatives market, and the bond market. These cover risks associated with exceptional price/interest rate movements. While margins are intended to cover the risk under normal market conditions, the default funds cover the risk under extreme conditions.

In addition to the above risk control measures, the CC&G specifies financial and operational requirements for its members. The financial requirements are set according to the markets cleared. As far as general clearing members are concerned, capital requirements also depend on the number of non-clearing members they represent.

4.3.6 Links to other systems

The CC&G, LCH.Clearnet SA and MTS SpA agreed in December 2002 to establish a CCP service for Italian government bond transactions executed on MTS Italy and EuroMTS. The service has since been extended to cover BrokerTec.

That agreement states that the use of a CCP by market members is not mandatory. Participants in the MTS and EuroMTS markets can choose between the CC&G's services and those of LCH.Clearnet. In order to give effect to this right of choice, the two CCPs are linked: each CCP is a general clearing member of the other. Both CCPs use the same methods for calculating margins and capital requirements for membership.

In July 2009, the CC&G was granted "recognised overseas clearing house" status by the Financial Services Authority, a prerequisite for performing post-trading services in the United Kingdom.

Since 2010, the CC&G has also provided IT outsourcing for LCH.Clearnet Ltd, the UK central counterparty for the EDX share and bond derivatives exchange of the London Stock Exchange Group.

4.3.7 Pricing

Participants pay an annual membership fee as well as monthly fees on the average daily value of securities deposited as collateral.

A clearing fee is charged for each lot cleared. This fee varies according to the type of contract. Exercise/assignment fees, delivery fees for derivatives, account transfer and account keeping fees are also charged together with periodic fees for margin calculation and the infrastructure used. Additional charges apply to specific events or services (eg fails, buy-ins, historical reporting).

4.4 Securities settlement systems (SSS): Monte Titoli's Express II

4.4.1 Institutional framework

Monte Titoli is a company offering the central custody and administration of transferable securities (shares and bonds), as well as securities settlement services.

Since December 2002, Monte Titoli has been part of the Borsa Italiana Group. After the 2007 merger of Borsa Italiana and the London Stock Exchange, Monte Titoli has been part of the London Stock Exchange Group.

In August 2000, Monte Titoli was authorised by the Italian Ministry of Economy and Finance to manage government bonds, which until then had been managed by the Bank of Italy. The actual transfer of government securities from the Bank of Italy to Monte Titoli took place at the end of 2000. Thus, a single Italian CSD now manages both private and government securities.

Dematerialisation has increased the CSD's importance, as title to securities is now authenticated by means of book entry.

Securities settlement systems are governed by a general regulation issued by the Bank of Italy with the agreement of CONSOB (see the legal provision of 24 December 2010 on the clearing and settlement of transactions involving non-derivative instruments under Article 69 of the CLFI).

In August 1998, the ECB included Monte Titoli in the list of securities settlement systems meeting the standards set by the European Monetary Institute (EMI) for the ESCB's credit operations.

In October 2000, Monte Titoli received authorisation to operate the Express RTGS system, which was upgraded into the Express II system in January 2004.

4.4.2 Participation

A general regulation issued by the Bank of Italy with the agreement of CONSOB establishes categories of participants in the CSD services. Access to settlement services is regulated in Monte Titoli's operating rules, which are issued by and approved by the Bank of Italy in agreement with CONSOB.

Access to the settlement system is restricted to banks and investment firms authorised to provide investment services in Italy (or are permitted to provide such services subject to mutual recognition), asset management companies, other financial intermediaries, Italian stockbrokers, CSDs and other institutions that operate SSS or netting and guarantee systems, and some public entities.

Foreign participants may access the system remotely. In particular, a foreign institution which acts as a CSD or as the operator of an SSS or a guarantee system may participate in the Italian SSS on a remote basis, provided it fulfils the following requirements: (i) it is subject to supervisory measures equivalent to those in force in Italy; and (ii) there is an agreement between the supervisory authorities of Italy and those of the foreign institution's home country concerning the exchange of information and reciprocity.

Participants may clear and settle securities transactions both on their own account and on behalf of other authorised intermediaries. Moreover, participants may either settle their cash positions directly on their TARGET2 accounts or appoint a TARGET2 bank to settle for them.

In December 2009, Monte Titoli had 2,494 members and 2,197 issuers. At the same date, the security settlement system had 112 participants.

4.4.3 Types of transaction

Express II clears and settles the following types of market and OTC transactions:

- outright transactions and repos involving Italian government securities carried out on MTS;
- stock exchange transactions involving equities, corporate bonds and Italian government securities;
- outright and repo transactions involving listed and unlisted securities carried out over the counter; and
- monetary policy operations (in the real-time gross settlement process).

4.4.4 Operation of the system and cash leg process

The Express II system combines the real-time gross settlement process with net settlement functionalities in a single environment. Both the RTGS and net settlement operate on the DVP basis, whereby the cash and securities are settled simultaneously.

The real-time gross settlement process settles, on a gross basis, what is left of the net batches, as well as any transactions submitted to the system by participants.

The settlement process of the securities leg is carried out as follows:

- for every transaction, the system checks the securities account balance of the seller, reserves the securities and sends information to TARGET2 for the cash settlement; and
- if the securities are not available on the seller's account, the system starts the queue management process. Queued transactions are periodically processed in the following order of priority: monetary policy operations; priority input by the intermediary; matching time (FIFO); and stock-building on the seller's securities account (FAFO).

The settlement stages of the cash leg are as follows:

- TARGET2 checks the cash account balance of the buyer, settles the cash leg and sends information to the SSS, which settles the securities leg using the reserved securities; and
- if funds in the cash account are not available, payments are queued.

Transactions concluded on regulated markets are always sent to the net component of Express II and are settled on a rolling basis (T+3 for outright transactions, while for repo transactions the settlement lags are as follows: T+0 for overnight transactions; T+1 for "tomorrow next" transactions; and T+2 for all other transactions). In 1999, the option to settle with same-day value (T+0) was introduced for repo transactions involving government securities ("overnight repo"). The time lag for same-day settlement has now been extended owing to the RTGS component of Express II.

Transactions concluded on the OTC market can be sent either to the net settlement component or to the RTGS component and are settled with the settlement lag agreed between the parties.

Express II has two net settlement batches: an overnight batch and a daylight batch.

The net settlement process is activated only if cash and securities are available. The intermediaries advise the quantity of cash to be reserved for the overnight cycle to the TARGET2 system by indicating the maximum amount to be set aside as reserve (this may have a "default" value or may be specified each time). This instruction is sent to the

TARGET2 system by the participants directly at the time of their admission and may be subsequently varied.

If the participant does not have sufficient securities or cash and is not eligible for securities lending or intraday liquidity, the transaction will be excluded from the netting batch. The transaction will be excluded during the optimisation process on the basis of an algorithm that identifies the maximum amount of transactions that can be settled taking into account the securities and cash on hand.

During the overnight cycle, the liquidity reserve can be increased by the amounts resulting from coupons and redemptions of government securities and, if necessary, by the granting of additional automatically collateralised intraday liquidity. Self-collateralisation allows the securities deriving from the settlement process to be used as collateral for the liquidity obtained from intra-day advance facilities. The self-collateralisation process is based on the profiles sent by payers at the time of firm collateralisation.

Having established the availability of securities and cash, the cash multilateral net balances resulting from the overnight clearing process are settled through TARGET2 at the start of the business day; simultaneously the securities multilateral net balances resulting from the overnight clearing process are settled in the CSD's accounts. Transactions that are not covered by the securities or cash are set aside and placed in the subsequent daylight net settlement batch; if there is still a shortage of securities and/or cash, the transactions will be forwarded to the RTGS component.

At the end of 2009, the face value of instruments in custody amounted to EUR 2,537 billion and their market value to EUR 2,825 billion. At the same date, the volume of payments amounted to more than 106,000 a day with a total value of EUR 178 billion.

4.4.5 Risk management

A regulation issued by the Bank of Italy with the agreement of CONSOB establishes general risk management criteria for securities settlement.

Specific risk management measures must be adopted, such as intraday finality, a queuing mechanism, and a reduction in the time between the collection of data on transactions and the settlement of those transactions. Minimum requirements for risk containment and settlement finality must also be met. Moreover, operating hours must be consistent with those of TARGET2.

The Express II process and the CDS's account structure allow intermediaries' proprietary positions to be completely segregated from those of their customers. It also allows settlement banks to manage the securities positions of each of their institutional customers separately, thus avoiding the risk of commingling.

Monte Titoli participants may also settle their cash positions indirectly, through a settling bank; Express II offers cap management mechanisms to settling banks to help them keep their funds exposure under control.

4.4.6 Links to other systems

The settlement of securities takes place by book entry on the securities accounts held by participants at Monte Titoli, and the settlement of cash is carried out in central bank money through a real-time link to the TARGET2 system.

4.4.7 Pricing

Fees are charged individually on market or OTC transactions sent to the overnight net settlement batch, as well as on bilateral balances, whether or not these are guaranteed by a CCP. Higher fees are charged on transactions that fail the overnight settlement and go to the

daylight net settlement batch. Additional fees are charged on the multilateral cash balances for settlement in the TARGET2 system.

Fees are charged individually on OTC and exchange-traded transactions sent to the real-time gross settlement process, for both the security leg and the cash leg. Additional fees are charged for recovering SWIFT messaging costs.

4.5 Use of securities infrastructure by the central bank

Until July 2010 the Express II real-time gross settlement process was used to settle monetary policy operations.

Since then, a system operated by the Bank of Italy has allowed intermediaries that access the Eurosystem (for monetary policy operations and intraday credit operations) to collateralise the loans they receive with securities and other assets held at just one account (a so-called pool account) at the Bank of Italy.

Intermediaries can credit their pool accounts, either directly or through a designated agent, with: (i) securities held at or transferred to Monte Titoli's accounts through a system of ECB-approved links between CSDs; (ii) securities held on accounts with Eurosystem national central banks and transferred through the CCBM system; and (iii) bank loans.

The Bank of Italy monitors the valuation of the pledged assets on a daily basis according to the criteria set by the Eurosystem (market value net of haircuts).

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

Contents

List of abbreviations	267
Introduction.....	269
1. Institutional aspects	271
1.1 The general institutional framework	271
1.1.1 Legal and regulatory framework	271
1.1.2 Legal basis for payment.....	273
1.1.3 Legal basis for clearing arrangements	273
1.1.4 Legal basis for securities settlement.....	274
1.1.5 Enforceability of netting arrangements.....	274
1.2 The role of the central bank	275
1.2.1 Issuance of banknotes.....	275
1.2.2 Provision of payment and settlement services	275
1.2.3 Oversight.....	276
1.2.4 Examination and monitoring	277
1.2.5 Treasury funds operations	277
1.3 The role of private and public sector bodies.....	278
1.3.1 Japanese Bankers Association (JBA) and other regional bankers’ associations.....	278
1.3.2 Japan Securities Dealers Association (JSDA)	278
1.3.3 Financial Services Agency (FSA)	279
2. Payment media used by non-banks.....	279
2.1 Cash payments.....	279
2.2 Non-cash payments.....	279
2.2.1 Non-cash payment instruments	279
2.2.2 Non-cash payment terminals	282
2.2.3 Recent developments (retail funds transfer services)	282
3. Interbank payment systems	283
3.1 General overview.....	283
3.2 Interbank payment systems	283
3.2.1 BOJ-NET Funds Transfer System (BOJ-NET FTS)	283
3.2.2 Zengin Data Telecommunication System (Zengin System).....	287
3.2.3 Foreign Exchange Yen Clearing System (FXYCS)	290
3.2.4 Bill and cheque clearing systems (BCCS) / Tokyo Clearing House.....	292
4. Systems for post-trade processing, clearing and securities settlement	294
4.1 General overview.....	294

4.2	Post-trade processing systems	294
4.2.1	Pre-Settlement Matching System (PSMS) at JASDEC	294
4.3	Central counterparties and clearing systems	295
4.3.1	Japan Securities Clearing Corporation (JSCC)	295
4.3.2	JASDEC DVP Clearing Corporation (JDCC).....	298
4.3.3	Japan Government Bond Clearing Corporation (JGBCC)	300
4.3.4	Osaka Securities Exchange (OSE)	303
4.3.5	Tokyo Financial Exchange (TFX).....	305
4.4	Securities settlement systems.....	307
4.4.1	JGB Book-entry System and BOJ-NET JGB Services	307
4.4.2	Japan Securities Depository Center (JASDEC)	309
4.5	The use of securities infrastructures by the central bank.....	311

List of abbreviations

BCCS	Bill and Cheque Clearing System
BOJ-NET	Bank of Japan Financial Network System
BOJ-NET FTS	BOJ-NET Funds Transfer System
Book-entry Transfer Act	Act Concerning Book-entry Transfer of Corporate Bonds, Shares and Other Securities
CP	Commercial Paper
FB	Financing Bill
FIEA	Financial Instruments and Exchange Act
FSA	Financial Services Agency
FXYCS	Foreign Exchange Yen Clearing System
JASDEC	Japan Securities Depository Center
JDCC	JASDEC DVP Clearing Corporation
JBA	Japanese Bankers Association
JGB	Japanese government bond
JGBCC	Japan Government Bond Clearing Corporation
JSCC	Japan Securities Clearing Corporation
JSDA	Japan Securities Dealers Association
OSE	Osaka Securities Exchange
PSA	Payment Services Act
PSMS	Pre-Settlement Matching System
Q/O account	Queuing and Offsetting Account
RTGS-XG	Next-Generation RTGS
SPDC account	Simultaneous Processing of DVP and Collateralisation Account
STRIP	Separate Trading of Registered Interest and Principal of Securities
TB	Treasury Bills
TBA	Tokyo Bankers Association
TCH	Tokyo Clearing House
TFX	Tokyo Financial Exchange
TSE	Tokyo Stock Exchange
TSEG	Tokyo Stock Exchange Group
Zengin-Net	Japanese Banks' Payment Clearing Network
Zengin System	Zengin Data Telecommunication System

Introduction

There are four major interbank payment systems in Japan: (i) the BOJ-NET Funds Transfer System (BOJ-NET FTS); (ii) the Zengin System; (iii) the Foreign Exchange Yen Clearing System (FXYCS); and (iv) the bill and cheque clearing systems (BCCS).

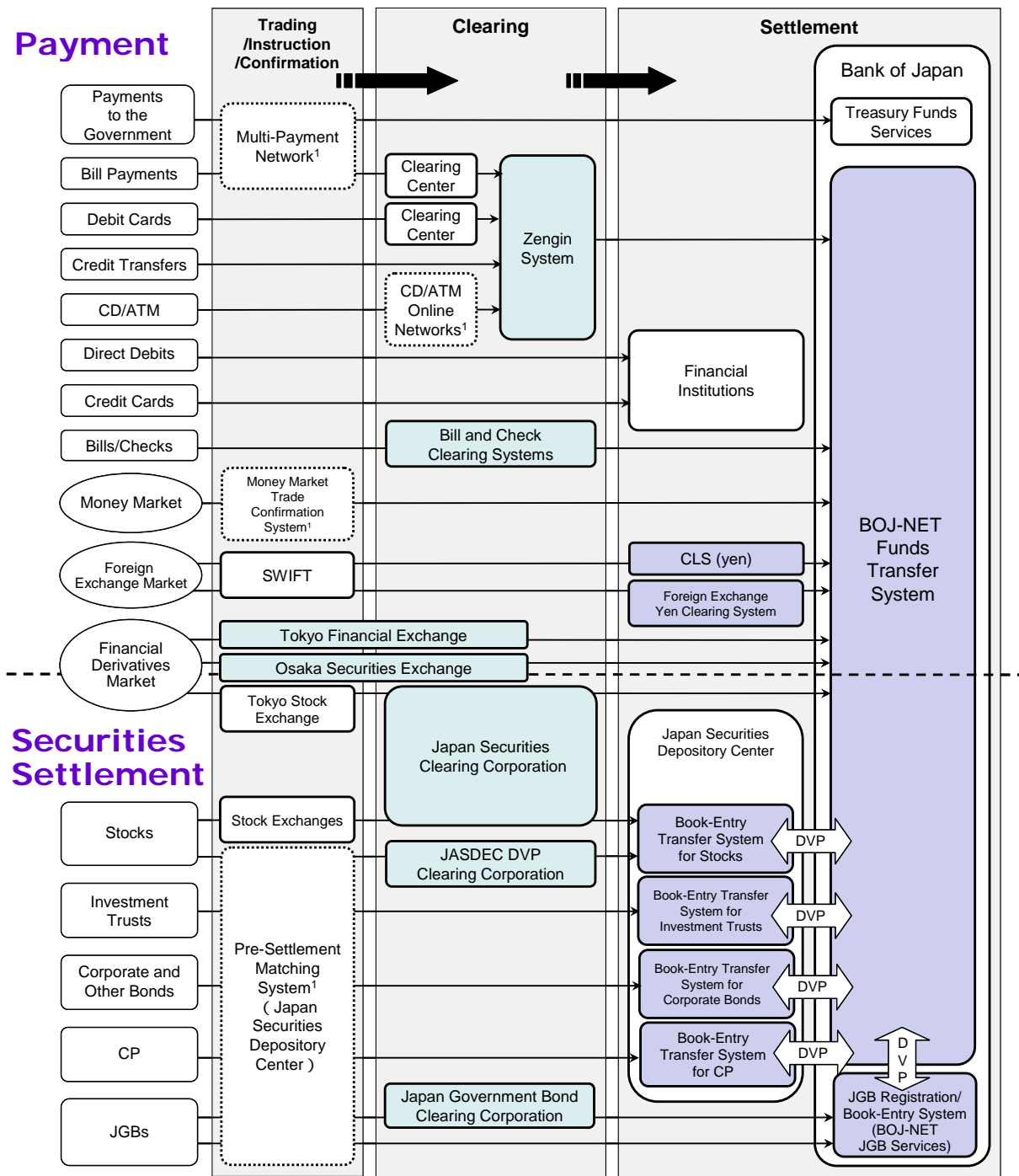
In November 2011, the Next-Generation RTGS (RTGS-XG) project was completed to bring new levels of safety and efficiency to large-value payments in Japan. The project consisted of two pillars: (i) the introduction of liquidity-saving features in the BOJ-NET FTS; and (ii) the migration of large-value payments to settlement on an RTGS basis in the BOJ-NET FTS. Such payments were previously processed by private sector deferred net settlement (DNS) systems, namely, the FXYCS and the Zengin System. As a result of the RTGS-XG project, large-value payments (payments in the BOJ-NET FTS, the FXYCS, and those of JPY 100 million and above in the Zengin System) are now settled on an RTGS basis. As for small-value payments (payments of less than JPY 100 million in the Zengin System and bills and cheques collected through BCCS), the net positions of participating financial institutions that are calculated by these clearing systems are settled in the BOJ-NET FTS.

For securities settlement, there are two major central securities depositories (CSDs) in Japan. The Bank of Japan is responsible for Japanese government bonds (JGBs), and the Japan Securities Depository Center (JASDEC) is responsible for all other securities, including stocks, corporate bonds, commercial paper, municipal bonds, convertible bonds, investment trusts, ETFs and REITs. With the establishment of a uniform securities settlement framework, various categories of these securities were dematerialised in JASDEC, and DVP mechanisms were adopted in a phased approach in the 2000s. To mitigate settlement risk in securities transactions, central counterparties (CCPs) were successively established in Japan after the relevant legislation was amended in 2002. These are (i) the Japan Securities Clearing Corporation (JSCC), which clears for all securities exchanges; (ii) the Japan Government Bonds Clearing Corporation (JGBCC) for JGB clearing; and (iii) the JASDEC DVP Clearing Corporation (JDCC) for the clearing of customer-side transactions in securities settled through JASDEC. In addition, the Tokyo Financial Exchange (TFX) and the Osaka Securities Exchange (OSE) internally clear transactions in listed derivatives, FX derivatives (retail margin trading of FX) and other instruments.

In retail payments, credit cards and e-money are widely used while the use of debit cards remains low. The predominance of cash for small-value payments and the almost complete absence of cheque use by individuals are the prominent features that distinguish payment practices in Japan.

Chart 1

Overview of payment and settlement systems in Japan



¹ Systems surrounded by the dotted line are not used for all transactions.

1. Institutional aspects

1.1 The general institutional framework

1.1.1 Legal and regulatory framework¹

1.1.1.1 General

There is no uniform or comprehensive legislation in Japan that governs payment, clearing and securities settlement. Rather, a number of laws combine to form the legal basis for payment, clearing and securities settlement.

1.1.1.2 Regulatory authorities

Most of the relevant laws governing a variety of financial sector matters specify the Prime Minister as the minister in charge. These include regulation and supervision in the areas of payment, clearing and securities settlement. In practice, the Prime Minister delegates authority to the Commissioner of the Financial Services Agency (FSA) based on the provisions of the relevant laws. For example, the FSA is the primary regulatory authority for:

- Deposit-taking services and payment services provided by licensed banks under the *Banking Act*;
- Securities-related services provided by registered financial instruments business operators such as investment firms and licensed banks under the *Financial Instruments and Exchange Act* (FIEA);
- Payment services provided by non-banks and the issuance of prepaid payment instruments under the *Payment Services Act* (PSA).

Together with the FSA, the Minister of Finance is in charge of matters related to JGBs. The Minister of Justice is also responsible for the legal and regulatory frameworks governing the book-entry transfer of securities, because these frameworks constitute a part of civil and commercial law.

1.1.1.3 Central bank

The *Bank of Japan Act* stipulates that in addition to regular business prescribed by Article 33 such as deposit-taking and funds transfers (the basic business component of the BOJ-NET Funds Transfer System), the Bank of Japan may, with authorisation from the Prime Minister and the Minister of Finance, conduct business (carried out in conjunction with its prescribed regular business) that contributes to the smooth settlement of funds. This includes operation of the Foreign Exchange Yen Clearing System and the JGB Book-entry System. In addition, the Bank of Japan oversees the payment and settlement systems operated by the private sector to achieve its objective as stipulated in Article 1 of the *Bank of Japan Act*, namely, “to ensure smooth settlement of funds among banks and other financial institutions, thereby contributing to the maintenance of the stability of the financial system” (see Section 1.2).

Against the background of the Bank of Japan’s role and functions as an overseer of the payment and settlement systems and a provider of settlement accounts to those systems, the Prime Minister can seek the Bank of Japan’s opinion, where necessary, before granting or revoking a regulatory licence for, or taking any enforcement action on, an interbank

¹ While the official texts of legislation are in Japanese, unofficial English translations are publicly available for some acts on the website operated by the Ministry of Justice, <http://www.japanlawtranslation.go.jp/re?=02>.

payment system or CCP for securities or financial derivatives (collectively referred to as “financial instrument transactions”) under the relevant legislation.²

1.1.1.4 *Payment and clearing systems*

The operator of the interbank payment system (ie the Zengin-Net) is regulated and supervised as a licensed interbank payment clearing institution by the Prime Minister under the PSA (see Section 3.2.2.1). Operators of bill and check clearing houses (eg regional bankers’ associations) are organised as non-profit incorporated associations.

The regulatory and supervisory framework for CCPs and exchanges is segmented on the basis of the assets underlying transactions. CCPs and exchanges for financial instrument transactions are regulated and supervised as licensed financial instrument clearing institutions (eg the Japan Securities Clearing Corporation) and exchanges (eg the Tokyo Stock Exchange) by the Prime Minister under the FIEA.³

The recently amended FIEA enables foreign CCPs to provide clearing services for domestic financial institutions in Japan (i) directly from abroad by obtaining a special licence; or (ii) indirectly by establishing a link with domestic financial instrument clearing institutions authorised as such. Under the amended FIEA, which will come into effect by the end of 2012, the Prime Minister can also require specified types of financial instrument transactions such as OTC derivatives to be centrally cleared by CCPs.

CCPs and exchanges for commodities (eg minerals or agricultural products) and their derivatives transactions are supervised and regulated as licensed commodity clearing organisations and exchanges by the Minister of Agriculture, Forestry and Fisheries and/or the Minister of Economy, Trade and Industry in accordance with the underlying assets under the *Commodity Futures Act*.

CCPs or exchanges can include both financial instruments and commodities in clearing services or trading lists provided they obtain both categories of licenses from the relevant ministers.

1.1.1.5 *Securities settlement systems and the credit claims transfer system*

CSDs (eg the Japan Securities Depository Center or the Bank of Japan as the JGB Book-entry System operator) are regulated and supervised as designated transfer institutions under the *Act Concerning Book-entry Transfer of Corporate Bonds, Shares and Other Securities* (the Book-entry Transfer Act)(see Sections 1.2.2.2 and 4.4.1.1).

The Book-entry Transfer Act stipulates the categories of account management institution – which include banks, cooperative depository institutions, registered financial instruments business operators, trust companies, insurance companies etc – that are allowed to hold accounts for customers in book-entry transfer systems. Under the Book-entry Transfer Act, the securities holdings of lower-tier participants and those of their customers held by participants must be recorded on the books of upper-tier participants or the CSD on an omnibus basis and separated from their own holdings. Account management institutions are also required under the FIEA to segregate securities and related funds belonging to each customer from their own securities and funds and from those of other customers.

Registrars of lists of electronic credit claim holders are regulated and supervised as designated electronic monetary claim recording institutions under the *Electronically*

² Article 86 of the Payment Services Act and Article 156-20-23 of the FIEA.

³ The definition of financial derivatives under the FIEA includes derivative transactions whose underlying assets are securities, currencies, interest rates, or an index thereof.

Recorded Monetary Claims Act, while assignments and pledges of credit claims can also be recorded on the books of public registrars (*tōki-sho*).

1.1.1.6 Trade repositories

Trade repositories (TRs) will be regulated and supervised as designated trade information repository institutions under the amended FIEA due to come into effect by the end of 2012. Financial institutions executing specified types of financial instrument transactions will be required (i) to maintain trade records and make reports to the Prime Minister; or (ii) to provide trade information to TRs. The Prime Minister can gain access to trade records maintained and stored by TRs.

1.1.2 Legal basis for payment

1.1.2.1 Payment and deposit-taking services

There is no specific civil and commercial act in Japan that specifically governs rights and obligations regarding funds transfers other than bills or cheques and deposit account transactions. They are governed by individual contractual relationships and general civil or commercial laws such as the *Civil Code* and the *Commercial Code*. The Japanese Bankers Association provides model agreements regarding payment and deposit account transactions for member financial institutions. Customer protection issues arising from the provision of payment services are handled under the relevant acts, such as the *Banking Act* or the PSA.

With respect to deposit-taking services, the *Capital Subscription Law* stipulates that all deposit-takers must be authorised under other relevant laws. Specifically, only certain categories of institution are allowed to take deposits: for example, banks are allowed to do so under the *Banking Act*, while other types of financial institution such as cooperative depository institutions do so under the respective laws governing them in this regard (eg *shinkin* banks under the *Shinkin Bank Law*).

In the case of financial derivatives, the master agreement established by ISDA is widely referred to among market participants, depending on the type of transaction.

1.1.2.2 Means of payment

Regarding means of payment, banknotes issued by the Bank of Japan and coins issued by the government have the status of legal tender under the *Bank of Japan Act* and the *Unit of Currency and Issuance of Coins Act*, respectively. Paper-based means of payment such as bills and cheques, which utilise deposit accounts for payment, are governed by the *Bill Act* and the *Cheque Act*. In addition, electronically recorded monetary claims can be utilised as electronic means of payment, which are alternatives for promissory notes, under the *Electronically Recorded Monetary Claims Act* (see Section 2.2.1.3).

Debit card services are regulated as a combination of payment services and deposit-taking services, and may be provided by licensed banks or cooperative depository institutions. In contrast, credit card services can be provided by non-banks. Credit card issuers are regulated and supervised as registered money lenders if they provide instalment or revolving loans and/or cash advance services to card holders under the *Instalment Sales Act* or the *Money-Lending Business Act*. The PSA provides the legal basis for prepaid payment instruments, including prepaid cards and chip-based or server-based electronic money, with a focus on the regulatory framework (see Section 2.2).

1.1.3 Legal basis for clearing arrangements

Legislation on clearing services (ie the PSA on interbank payment clearing, the FIEA on financial instrument clearing, and the *Commodity Futures Act* on commodity clearing) provide

the legal basis for an entity to conduct these services. These acts recognise several arrangements as the legal basis for clearing, such as the assumption of obligations⁴ and novation.

1.1.4 Legal basis for securities settlement

The Book-entry Transfer Act provides for the dematerialisation of various types of securities including government bonds, corporate bonds, commercial paper, shares, share options, convertible bonds (bonds with share options), beneficial interests in investment funds etc, and facilitates the establishment of multi-tiered book-entry systems for such securities.

Alternatively, corporate bonds, shares, share options or convertible bonds can be dematerialised on the basis of the *Companies Act* provided corporate issuers specify accordingly (i) in the terms and conditions of corporate bonds; or (ii) in their articles of incorporation for shares and share-related securities. In these cases, the names of securities holders are recorded and verified by the company registry for each type of securities.

Rights and obligations regarding the settlement of individual securities are governed by the abovementioned acts. Under these acts and in accordance with general civil or commercial laws, legal title and interests in securities are transferred or perfected via (i) credits and debits to accounts on the books of the CSD and participants for book-entry securities; (ii) changes in the names of securities or credit claim holders on the issuer's registry for other dematerialised securities; or (iii) delivery of certificates for physical securities.

In addition, the Japan Securities Dealers Association provides the model agreement and sets guidelines for outright or repurchase transactions in securities (see Section 1.3.2).

1.1.5 Enforceability of netting arrangements

Payment netting is considered to be a legally enforceable arrangement for counterparties performing their obligations under general civil or commercial laws.

Further, obligation netting (netting by novation) between two counterparties is considered to be legally enforceable even in the event of a counterparty's default under such laws, and also in insolvency proceedings against a counterparty under insolvency laws such as the *Bankruptcy Act*, the *Civil Rehabilitation Act*, and the *Corporate Reorganization Act*.

Closeout netting between two counterparties for contracts with market quotations is legally enforceable in the event of insolvency proceedings against a counterparty under insolvency laws when stipulated in the master agreement. In addition, the *Act on Closeout Netting of Specified Financial Transactions Entered into by Financial Institutions* ensures that closeout netting for specified types of financial transactions (eg financial derivatives, cash-collateralised securities lending and repurchase agreements, foreign exchange forwards and swaps, and collateral transfers for these transactions) between two counterparties is legally enforceable in the event of insolvency proceedings against a counterparty.

Multilateral netting via a CCP is legally effective and enforceable also in insolvency proceedings against a clearing participant. In particular, when a licensed clearing institution or organisation sets out in its business rules procedures for settling outstanding obligations including closeout netting and the disposition of posted collateral, such procedures are

⁴ The assumption of obligations is the process by which the CCP interposes itself between two counterparties of a financial transaction and which is stipulated in relevant laws such as the PSA or the FIEA.

legally enforceable even in insolvency proceedings against a clearing participant under the PSA, the FIEA, or the *Commodity Futures Act*.

1.2 The role of the central bank

The Bank of Japan, Japan's central bank, was founded in 1882. Article 1 of the *Bank of Japan Act* stipulates that the Bank of Japan's purposes are to issue banknotes, to carry out currency and monetary control and to ensure the smooth settlement of funds among banks and other financial institutions, thereby helping to maintain the financial system's stability. To these ends, the Bank provides various payment and settlement services such as by providing means of payment (ie banknotes and deposits in current accounts held with the Bank of Japan) and operating the BOJ-NET as the central bank's online payment and JGB settlement system. The Bank of Japan also oversees payment and settlement systems in the private sector. The responsibilities of the Bank of Japan in the field of payments and settlements are explained in the following subsections.

1.2.1 Issuance of banknotes

The Bank of Japan is the sole issuer of banknotes in Japan, and banknotes are given the status of legal tender under the *Bank of Japan Act*. In other words, they must be accepted by any creditor in satisfaction of any debt except when otherwise agreed by both the debtor and the creditor.

In order to prevent counterfeiting and alterations, banknotes embody a variety of security features. Given the surge in the number of counterfeit banknotes detected in recent years, in November 2004, the Bank of Japan began issuing a new series of Bank of Japan notes (10,000, 5,000, and 1,000 yen notes) with state-of-the-art security features. To address counterfeiting on a global basis, the Bank of Japan actively exchanges information and conducts joint studies with foreign central banks.

1.2.2 Provision of payment and settlement services

1.2.2.1 Payment through current accounts

The current account deposits of financial institutions at the Bank of Japan are used for a number of purposes including serving as settlement assets for interbank obligations. At the end of 2010, some 555 institutions, including banks, securities companies and central counterparties, held current accounts with the Bank of Japan.⁵ Since 1988, the Bank of Japan has operated an online payment system – the BOJ-NET Funds Transfer System (BOJ-NET FTS) – to process funds transfers between financial institutions through central bank accounts (see Section 3.2.1).

The Bank of Japan provides current account services to financial institutions that meet criteria, first published in 1998, specifying that applicants need to be in sound financial condition in terms of capital adequacy, must have appropriate operational capability, and must enter into a contract with the Bank of Japan under which they agree to undergo on-site examinations conducted by the Bank of Japan based on Article 44 of the *Bank of Japan Act*.

Since the start of 2001, under Article 33 of the *Bank of Japan Act*, the Bank of Japan has provided intraday overdrafts to facilitate the smooth settlement of funds through central bank accounts on an RTGS basis. In 2011, the Bank of Japan completed the Next-Generation

⁵ Participants in the BOJ-NET FTS comprise both current account holders with access to the BOJ-NET network (online participants) and those without (offline participants).

RTGS (RTGS-XG) project to bring higher levels of safety and efficiency to large-value payments (see Section 3.1). Separately, in its role as the lender of last resort, the Bank of Japan may extend loans to financial institutions experiencing liquidity constraints under Articles 33, 37 and 38 of the *Bank of Japan Act*.

1.2.2.2 Settlement of JGB transactions

The Bank of Japan has provided JGB registration services since 1906 as the sole registrar under the *Law Concerning Government Bonds*. In 1980, the Bank of Japan established the JGB Book-entry System, in which the Bank of Japan serves as the depository, to promote sound development of the JGB secondary market. In 1990, the Bank of Japan introduced an online system – BOJ-NET JGB Services – to process transfer registrations and book-entry transfers of JGBs.

The legal framework for the JGB settlement system was amended in 2003. The Bank of Japan abolished the previous JGB settlement system based on private laws such as the *Civil Code* and *Commercial Code*, as well as on contractual agreements between the Bank of Japan and system participants. It then started a new system based on the Book-entry Transfer Act, thereby achieving full dematerialisation of JGBs.

With these changes in the legal framework, several new obligations and schemes have been introduced.⁶ However, the fundamental functions of the JGB settlement system remain unchanged, so that rights in JGBs continue to be evidenced by balances recorded on the books and are transferred by crediting and debiting the accounts on these books (see Sections 1.1.1 and 4.4.1).

The Bank of Japan sets the admission requirements for participants in the JGB Book-entry System with a view to further enhancing the system's administrative transparency. These requirements specify that system participants need to be in a sound financial condition in terms of capital adequacy and to have appropriate operational capability.

1.2.3 Oversight

The Bank of Japan oversees payment and settlement systems operated by the private sector to ensure the safety and efficiency of payment and settlement arrangements in Japan.

The Bank of Japan's oversight focuses on the following types of private sector payment and settlement systems: (i) payment systems; (ii) securities settlement systems; and (iii) central counterparties. The Bank of Japan oversees payment systems to ensure safety and efficiency because the systemic risk posed by payment systems is a potential threat to the stability of the financial system and the overall economy. The Bank of Japan also oversees securities settlement systems and central counterparties on the grounds that these systems also present a systemic risk similar to that of payment systems. These systems are closely interrelated with payment systems, as they are used not only to transfer and/or clear securities and other financial products, but also include related rules and contracts for the transfer of funds provided against securities and other financial products. Although payment arrangements are needed to increase the safety and efficiency of these systems, such

⁶ If the book-entry transfer institution (CSD) or an account management institution (CSD participants) for the JGB settlement system records, for some reason, amounts larger than the correct amounts of JGBs ("overbooking"), the overbooking problem must be resolved so that the total amount of JGBs recorded in the system matches the actual outstanding amount of book-entry JGBs issued. In addition, an investor protection trust scheme was introduced to compensate retail investors for any loss or damage they suffer in the event an account-keeping institution becomes insolvent before fulfilling its obligations to resolve an overbooking problem.

arrangements give rise to systemic risk whereby disruptions in any one system can cause subsequent settlement failures in other interrelated payment systems.

The intensity of the Bank of Japan's oversight is commensurate with the size and characteristics of the risks posed by individual payment and settlement systems subject to the Bank of Japan's oversight. The Bank of Japan has a particular focus on "systemically important payment and settlement systems". Such systems, should they fail to perform as expected, could have a significant impact not only on payment and settlement systems but also on the wider financial system and the economy as a whole. Whether or not a payment and settlement system is systemically important is determined based on the following combination of factors: (i) value and number of transactions settled; (ii) number and types of system participants; (iii) characteristics of transactions settled; (iv) availability of alternative systems or payment instruments; (v) interdependencies with other systems; and (vi) relationship with the Bank of Japan.

For systems determined to be systemically important, the Bank of Japan exercises oversight by monitoring such systems, assessing them against its safety and efficiency objectives and, where necessary, inducing changes. For systems determined to be less systemically important, the Bank of Japan exercises oversight mainly by monitoring such systems in order to gain an overview of overall payment and settlement arrangements in Japan.

The Bank of Japan's oversight primarily focuses on payment and settlement systems located in Japan. However, the scope of the Bank of Japan's oversight covers offshore yen payment systems that could have a significant impact on the safety and efficiency of payment arrangements in Japan. Determining whether an offshore yen payment system has the potential to have a significant impact depends on a combination of factors including the value and volume of yen payment transactions processed by the system and the degree of interdependency between the offshore payment system and domestic payment systems. The Bank of Japan participates in the cooperative oversight of CLS and SWIFT in cooperation with other central banks.

In 2010, the Bank of Japan's Policy Board adopted and released the "*Policy on Oversight of Payment and Settlement Systems*" and the "*Policy on Oversight of Offshore Yen Payment Systems*". These policies updated the relevant policy published in 2002 with the aim of providing greater clarity on the Bank of Japan's oversight objectives and policy, while taking into account various issues including recent changes surrounding payment and settlement systems.

1.2.4 Examination and monitoring

The Bank of Japan conducts on-site examinations and off-site monitoring of financial institutions that hold current accounts with it. When making an on-site examination, in addition to analysing the institution's asset quality and profitability, the Bank of Japan evaluates the reliability and security of its computer systems and the management of settlement risks arising from participation in payment and settlement systems or from the provision of settlement services to other financial institutions. Off-site monitoring also covers issues associated with settlement activities, including financial institutions' management of their daily liquidity needs and the total value of securities eligible as collateral for credit extended by the Bank of Japan. These monitoring functions also help the Bank of Japan to fulfil a number of its other duties including the conduct of monetary policy and ensuring the smooth functioning of the overall payment and settlement system.

1.2.5 Treasury funds operations

On behalf of the central government, the Bank of Japan receives and disburses treasury funds pursuant to the *Bank of Japan Act* and the *Public Accounting Law*, as well as handling JGB-related services such as issuance, and payment of principal and interest. For example,

the Bank of Japan receives payments of national taxes and social security premiums from the general public, either indirectly via financial institutions acting as its agents⁷ or directly at its offices, and the funds collected are deposited in government accounts. The Bank of Japan also disburses treasury funds to the general public in a similar manner, including payments for public works projects and pensions (see Chart 1).

The Bank of Japan provides accounting services for government deposits held with the Bank of Japan. The Bank of Japan also sorts and calculates receipts and disbursements of treasury funds for government agencies and specific government accounts.

The Bank of Japan has taken measures to achieve more streamlined online processing for treasury funds operations for the convenience of the public and to enhance efficiency in the operations of related institutions.

1.3 The role of private and public sector bodies

1.3.1 Japanese Bankers Association (JBA) and other regional bankers' associations

The JBA represents Japan's banking industry. Its membership comprises banks, bank holding companies and regional bankers' associations. The current JBA was reorganised in April 2011 as a general incorporated association through the acquisition of the business formerly held by the Tokyo Bankers Association, the largest of the regional bankers' associations and the former Japanese Bankers Association. The JBA then took over the operations of the Tokyo Clearing House and the Foreign Exchange Yen Clearing System, and became the sole shareholder of Zengin-Net, the operator of the Zengin System.

In addition to operating payment systems, the JBA establishes market practices and standards to enhance the safety and efficiency of the industry's payment procedures. The JBA also serves as the secretariat for the SWIFT User Group of Japan and some CD/ATM networks. As of September 2011, there were 123 full member banks, three bank holding company members, 63 associate member banks and 60 special members (regional bankers' associations).

The core business of the other 60 regional bankers' associations is to conduct bill and cheque clearing among their member banks.

1.3.2 Japan Securities Dealers Association (JSDA)

The JSDA serves as an interlocutor for the securities industry. As a fully empowered self-regulatory organisation under the *Financial Instruments and Exchange Act*, the JSDA regulates market intermediaries. Its self-regulatory functions encompass rule-making, enforcement, inspection, disciplinary action, accreditation of sales representatives and dispute mediation. The JSDA also supports policy dialogue among the industry, the government, and other related parties, conducts and promotes investor relations and undertakes studies aimed at further activating the market. As of September 2011, there were 292 regular members (securities companies) and 218 special members (registered financial institutions comprising banks, insurance companies, money market dealers, credit cooperatives, government-related financials and securities finance companies etc).

⁷ With the approval of the government, the Bank of Japan enters into agency contracts with financial institutions allowing designated branches of such institutions to act as its agents for the collection and disbursement of government funds.

1.3.3 Financial Services Agency (FSA)

The FSA is responsible for ensuring the stability of Japan's financial system, the protection of depositors, insurance policyholders and securities investors, and the smooth operation of the finance sector through such measures as planning and policymaking concerning the financial system, the inspection and supervision of private sector financial institutions, and surveillance of securities transactions.

The FSA implements various policy measures to fulfil its responsibilities. It recently established the *Payment Services Act*, which allows non-banks to offer funds transfer services that only banks were previously allowed to provide and it set out the regulatory framework for interbank payment clearing institutions. As the primary regulatory authority, the FSA inspects and supervises private sector financial institutions including banks, securities companies, insurance companies, market participants and exchanges. The interbank payment clearing institution (ie Zengin-Net), financial instruments clearing institutions (ie JGBCC, JSCC, JDCC, OSE, TFX) and transfer institutions (ie the Bank of Japan and JASDEC) are also regulated by the FSA (see Sections 1.1 and 4.4.1.1). The FSA's on-site inspections are aimed at ensuring the sound and appropriate operation of financial business and at protecting consumers.

2. Payment media used by non-banks

2.1 Cash payments

Cash consists of banknotes and coins and is used more extensively in Japan than in many other advanced economies. The ratio of cash in circulation to nominal GDP, 18% at the end of 2010, was the highest among CPSS countries. At the end of 2010, banknotes in circulation totalled JPY 82 trillion (USD 1,000 billion) and coins JPY 4.5 trillion (USD 60 billion).⁸

The Bank of Japan has the exclusive authority and responsibility for issuing and circulating banknotes. Article 46 of the *Bank of Japan Act* stipulates that banknotes shall be used as legal tender for payments and that there is no limit to the acceptability of banknotes for payments (see Section 1.1.2.2). The Bank of Japan issues banknotes in four denominations: 1,000 yen, 2,000 yen, 5,000 yen and 10,000 yen. Coins are issued by the Japanese government and are put into circulation by the Bank of Japan under the *Unit of Currency and Issuance of Coins Law*. Coins come in six denominations: 1 yen, 5 yen, 10 yen, 50 yen, 100 yen and 500 yen.

2.2 Non-cash payments

2.2.1 Non-cash payment instruments

2.2.1.1 Credit transfers

Credit transfers are popular for remitting funds to a payee in a remote location, or for sending large amounts where physical delivery of cash would entail risks. Most credit transfers use electronic funds transfer systems for making intrabank or interbank payments. Interbank credit transfers are processed through private clearing systems such as the Zengin System, and sometimes directly through the BOJ-NET Funds Transfer System (see Chart 1, Sections 3.2.1 and 3.2.2).

⁸ Converted at end-of-year JPY/USD exchange rates for 2010.

Prearranged direct credits used for the payment of salaries and pensions are an example of such credit transfer services. They are based on a tri-party agreement among the payer, the payee and their banks. In the case of salaries, the firm using the service sends payroll data to its bank, and the bank transfers funds according to the data on the designated day.

2.2.1.2 *Direct debits*

Prearranged direct debits are intrabank funds transfer arrangements widely used for making a broad range of recurring payments. They are used extensively for the payment of public utility bills, credit card bills, taxes, school tuition fees, insurance premiums and loan repayments (see Chart1).

Direct debit services are provided on the basis of a tri-party agreement between the payer, the payee and their banks. The payee sends payment instructions to the bank on paper, on magnetic tape or via online transmission. On a set day, the bank debits the amount instructed from the payer's ordinary deposit account and credits the payee's account.

2.2.1.3 *Bills and cheques*

Bills are used for payments in the business sector and can be discounted by banks. Cheques are widely used by government agencies and firms, but are used only rarely for the payment of salaries, or payments by individuals (eg for the payment of credit card bills and public utility bills). Both bills and cheques are collected and exchanged between banks at regional bill and cheque clearing houses (see Chart 1 and Section 3.2.4). The volume of transactions using these paper-based instruments has recently been declining. The value of bills and cheques cleared at Tokyo Clearing House was JPY 780 trillion in 2000 and JPY 270 trillion in 2010. This trend is attributable to firms using credit transfers more widely than bills for payments, for reasons such as the stamp tax on bills, custody costs and risk of loss.

Introducing a new payment method in the business sector, electronically recorded monetary claims were created under the *Electronically Recorded Monetary Claims Act*, which came into force in December 2008. These are intended to eliminate the shortcomings of bills and facilitate financing for businesses, particularly small and medium-sized enterprises (see Section 3.2.4.7).

2.2.1.4 *Credit cards*

Credit cards are one of the most common non-cash retail payment instruments in Japan. They are used mainly for medium-value payments, with JPY 5,400 (USD 60⁹) as the average value of a credit card payment made in 2009. In recent years, credit cards have become widely used in the e-commerce market, and are also used for smaller-value payments.

In Japan, credit granted through credit cards is usually settled in full at the end of the monthly period, with no interest charged. Credit card companies provide a variety of payment options such as multiple payment plans, revolving credit, and cash dispensing and financing, but their popularity is limited. Some cards charge an annual membership fee, but customers get benefits in return such as cash-back programmes, mileage points or discounts at affiliated stores (see Chart 1).

In most cases, the Credit and Finance Information System (CAFIS), a system established by NTT Data Corporation, carries out the necessary data processing for credit card payments. When a customer presents a credit card to a member merchant, the information on the magnetic stripe or the IC chip is read by a credit authorisation terminal (CAT) and sent to the computer system of the credit card company via the CAFIS Center. The computer system

⁹ Converted at yearly average JPY/USD exchange rates for 2009.

checks for lost or stolen cards, verifies credit limits and automatically processes the purchase.

2.2.1.5 Debit cards

Debit card use remains low compared to that of other major retail payment instruments such as cash and credit cards. The average value of a debit card payment in 2009 was relatively high at JPY 56,000 (USD 600). The total value of debit card payments made in 2009 was JPY 740 billion (USD 8 billion), which is about 1/50th of that of credit cards.⁹

A nationwide debit card service called “J-Debit” is provided by the Japan Debit Card Promotion Council. The majority of financial institutions in Japan participate in J-Debit, and the service has been incorporated into most of the cash cards issued in Japan. While other retail payment instruments such as credit cards and e-money are usually available for use 24 hours a day, the J-Debit service is generally not available for a specific period during the night.

The CAFIS network is used to process J-Debit data (see Section 2.2.1.1). When customers purchase goods or services using a debit card, they insert their card into a CAT terminal and enter their personal identification number (PIN) from a keypad attached to the terminal. The transaction data are sent from the terminal to the customer’s bank via the CAFIS Center. Upon receiving the data, the bank debits the customer’s account. The CAFIS Center then sends the transaction data to the clearing centre, where net positions between banks are calculated on the day following the transaction. Two days after the transaction, interbank net positions are cleared with other interbank payments through the Zengin System or through other smaller clearing systems operating within groups of financial institutions of the same type. The member merchant’s account is credited three days or more after the transaction.

2.2.1.6 Electronic money

Used for multiple purposes, e-money is a stored value or prepaid electronic payment instrument that requires users to “load” a certain value before using it. The major e-money brands widely accepted in Japan are categorised into three groups by issuer type: (i) e-money issued by an e-money company (eg Edy); (ii) e-money issued by public transportation companies (eg Suica, PASMO); and (iii) e-money issued by retailers (eg nanaco, WAON).

Although e-money is much less widely employed than other major retail payment instruments such as cash and credit cards, its use is growing by 40–50% annually in terms of both value and number of transactions. This suggests that e-money has gained a certain level of recognition in retail payments. The total number and value of e-money transactions amounted to 0.17 billion and JPY 140 billion in June 2010, with the number of cards in circulation reaching 0.13 billion in April 2010. The use of e-money has also been favoured by the growing number of terminals and the widespread use of common terminals.

2.2.1.7 Multi-Payment Network

Multi-Payment Network (MPN) is an electronic bill payment system established by the Japan Multi-Payment Network Promotion Association (JMPA) in 2001. MPN provides a network service called “Pay-easy” which connects billers (utility companies, national and municipal government bodies) and financial institutions to process payment data for taxes, public utility bills, insurance premiums and e-commerce bills. MPN lets customers make such payments easily using ATMs, mobile phones or personal computers. It also allows billers to be notified of payment information immediately after payers have paid their bills. MPN was established and is managed through cooperation between financial institutions. Both transaction volume and value have increased steadily since the MPN service started in 2001. Some 38 million transactions worth JPY 5.7 trillion were conducted during the 2009 fiscal year (see Chart 1).

2.2.1.8 Convenience store banking

Convenience stores accept payments from customers settling their bills from public utilities and telecommunications companies, and send them to the receiving companies by way of credit transfer. In addition, ATMs that have access to the ATM services of various banks, including in some cases access to consumer finance services, have been available at convenience stores since 1999. In 2001, a bank that has no branches and relies heavily on convenience store ATMs started operations.

Such services are becoming popular due to the fact that convenience stores are more easily accessible than banks in terms of both location and business hours. Convenience stores are found everywhere and are open 24 hours a day, seven days a week, while bank windows are generally available only during bank business hours on weekdays.

2.2.2 Non-cash payment terminals

2.2.2.1 ATMs

Automated teller machines (ATMs) provide cash withdrawal and cash deposit services. They accept both banknotes and coins and process credit transfers and loans. Throughout the past few decades, banks have installed increasing numbers of ATMs, with about 140,000 machines deployed by the end of March 2009.

Banks link their in-house ATM systems with other banks' systems to enable customers to withdraw banknotes from the ATMs of peer banks. Nine major online networks have been established to date, each operated within a group of financial institutions of the same type.¹⁰ The Multi Integrated Cash Service (MICS) serves as the relay centre for the nine networks and provides nationwide ATM data transmission and clearing services. The MICS had 1,377 financial institutions as members at the end of March 2009, linking virtually every financial institution in the private sector. Interbank credit and debit positions resulting from the use of these ATM networks are calculated at the end of each business day. Interbank net positions are cleared together with other interbank payments through the Zengin System or groups' own clearing systems, and are then settled through accounts held with the Bank of Japan or with groups' central organisations. Non-banks such as life insurance companies and securities companies also have their own ATMs.

2.2.2.2 E-money terminals

The increase in the number of e-money terminals has accelerated with the expansion of e-money affiliated shops. There were 287,000 such terminals at the end of 2007 and 591,000 at the end of 2009. While each e-money brand started out by installing proprietary terminals, increasing numbers of terminals are now interoperable between brands.

2.2.3 Recent developments (retail funds transfer services)

Since the *Payment Services Act* came into force in April 2010, non-bank entities have been allowed to offer funds transfer services that only banks and other deposit-taking financial institutions were previously permitted to provide. In order to provide funds transfer services, an entity must be registered as a funds transfer service provider and is subject to regulations set by the Financial Services Agency, such as the requirement to preserve the equivalent value of funds accumulated by their customers. Just like bank deposits, funds accepted by

¹⁰ City banks, regional banks, member banks of the Second Association of Regional Banks, trust banks, long-term credit banks and the Shoko Chukin Bank, *shinkin* banks, credit cooperatives, labour credit associations and agricultural cooperatives.

funds transfer service providers are redeemable at any time and at par value, and the payment of interest on such funds is not permitted. Both one-shot services and account-based services for recurring transactions are permitted. However, the amount of funds to be transferred per customer request must not exceed JPY 1 million. As of September 2011, there were 18 registered funds transfer service providers including wireless carriers, e-commerce companies and foreign remittance service providers.

3. Interbank payment systems

3.1 General overview

There are four major interbank payment systems in Japan: (i) the BOJ-NET Funds Transfer System (BOJ-NET FTS); (ii) the Zengin System; (iii) the Foreign Exchange Yen Clearing System (FXYCS); and (iv) the bill and cheque clearing systems (BCCS). In 2010, the average value per transaction was JPY 2.1 billion (USD 23 million) for the BOJ-NET FTS, JPY 450 million (USD 5 million) for the FXYCS, JPY 1.8 million (USD 20,000) for the Zengin System and JPY 9.6 million (USD 110,000) for bills and cheques cleared by the Tokyo Clearing House, the largest bill and cheque clearing system (see Chart 1).¹¹

In November 2011, the Next-Generation RTGS (RTGS-XG) project was completed to bring new levels of safety and efficiency to large-value payments in Japan. The project consisted of two pillars: (i) the introduction of liquidity-saving features into the BOJ-NET FTS; and (ii) the migration to RTGS in the BOJ-NET FTS of large-value payments that were previously processed by private sector DNS systems, namely, the FXYCS and the Zengin System. The changes were implemented in two phases, with the introduction of liquidity-saving features into the BOJ-NET FTS and the migration of all payments in the FXYCS to RTGS taking place in Phase 1 and the migration to RTGS of large-value payments in the Zengin System taking place in Phase 2. Phase 1 was successfully implemented in October 2008 and Phase 2 in November 2011.

As a result of the RTGS-XG project, large-value payments (payments in the BOJ-NET FTS, the FXYCS, and those of JPY 100 million or more in the Zengin System) are now settled on an RTGS basis. As for small-value payments (payments smaller than JPY 100 million in the Zengin System and bills and cheques collected through BCCS), the net positions of participating financial institutions, which are calculated by these clearing systems, are settled in the BOJ-NET FTS.

3.2 Interbank payment systems

3.2.1 BOJ-NET Funds Transfer System (BOJ-NET FTS)

The Bank of Japan Financial Network System (BOJ-NET) is a computer network that transmits and processes transfer instructions. It links the Bank of Japan's computer centre, its head office/branches, and the system's participants. The BOJ-NET comprises two systems: a system for funds transfers (the BOJ-NET FTS) and a system for the settlement of JGBs (BOJ-NET JGB Services, see Section 4.4.1).

Introduced in 1988, the BOJ-NET FTS processes funds transfers through current accounts that participants hold with the Bank of Japan. In January 2001, the BOJ-NET FTS closed its DNS mode and was converted to a pure RTGS system. In November 2011, the RTGS-XG

¹¹ Converted at yearly average JPY/USD exchange rates for 2010.

project was successfully implemented (see Section 3.1). The daily volume and value of transactions settled through the BOJ-NET FTS averaged 51,000 transactions and JPY 100 trillion (USD 1,200 billion¹¹) in 2010 (see Chart 1).

3.2.1.1 Institutional framework

The BOJ-NET FTS is owned and operated by the Bank of Japan. The *Bank of Japan Act* provides the legal basis for the Bank of Japan's operation of the BOJ-NET FTS. The Bank of Japan accepts deposits and provides funds transfer services as part of its "regular business", as listed in Article 33. The Bank of Japan's provision of online services through the BOJ-NET is authorised as "business deemed to contribute to the smooth settlement of funds among financial institutions" by the Commissioner of the Financial Services Agency (FSA) and the Minister of Finance based on Article 39 and Article 61–2.

The Bank of Japan reviews the design and operation of the BOJ-NET FTS on the basis of international standards such as the *Core Principles for Systemically Important Payment Systems* drafted by the CPSS and IOSCO. Based on these review findings, the Bank of Japan then develops an improvement plan for the BOJ-NET and implements it following approval by the Policy Board. The Bank of Japan makes the plan public and seeks comment from system participants where necessary. The Operations Department and the Information System Services Department are in charge of BOJ-NET operations. The Bank of Japan's executive auditors and the Internal Auditors' Office audit the Bank of Japan's operations, including issues relating to the BOJ-NET.

3.2.1.2 Participation

The Bank of Japan has set out and published criteria for parties eligible to hold current accounts with it and have access to its lending. The criteria specify the following categories of institutions as eligible to hold current accounts with the Bank of Japan: (i) institutions playing a key role in payments; (ii) institutions playing a key role in securities settlement; and (iii) institutions playing an intermediary role in interbank money markets. Specifically, these include banks, branches of foreign banks in Japan, *shinkin* banks, central credit organisations, securities companies, securities finance companies, money market brokers, payment clearing organisations and central counterparties. The Bank of Japan requires applicants to conduct their business properly, be in sound financial condition, and have appropriate operational capability. Financial condition is assessed based on capital adequacy ratios, and specific criteria are set according to the type of institution. If the institution is a "financial institution" as defined in Article 37 of the *Bank of Japan Act*, it must also enter into a contract under which it agrees to be subject to on-site examinations by the Bank of Japan.

At the end of 2010, there were 347 online participants¹² in the BOJ-NET FTS, including 142 banks, 54 branches of foreign banks in Japan, 91 *shinkin* banks, five central organisations of cooperatives, 39 securities companies, three money market brokers, and 13 other institutions such as central counterparties.

The Bank of Japan does not generally allow for remote access, ie access by an institution that has neither its head office nor any other form of authorised establishment in Japan.

¹² Participants in the BOJ-NET FTS comprise both current account holders with access to the BOJ-NET network (online participants) and those without (offline participants). Now that most participants have access to BOJ-NET online, only a small number of regional financial institutions remain as offline participants.

3.2.1.3 Types of transaction

The BOJ-NET FTS is used for (i) funds transfers between financial institutions stemming from the interbank money market transactions, securities transactions and customer transfers; (ii) funds transfers between different accounts of the same financial institution;¹³ (iii) settlement of net positions arising from privately owned clearing systems; and (iv) funds transfers between financial institutions and the Bank of Japan, including those for open market operations. In addition to payments directly submitted to the BOJ-NET FTS, all FXYCS payments and large-value payments in the Zengin System (currently defined as payments equal to or larger than JPY 100 million) are submitted/routed to BOJ-NET FTS. Most funds transfers made through the BOJ-NET FTS are credit transfers, but in the case of in-house funds transfers, debit transfers can also be made. A sending bank can transmit a payment instruction with information regarding its and/or the receiving bank's customers.

3.2.1.4 Operation of the system and settlement procedures

All interbank transactions settled through the BOJ-NET FTS are processed on an RTGS basis. Settlement is final once the sending participant's account with the Bank of Japan is debited and the receiving participant's account is credited.

In addition to its Home Account, a participant in BOJ-NET FTS can hold a Queuing and Offsetting Account (Q/O account) and an account for Simultaneous Processing of DVP and Collateralisation (SPDC account).¹⁴ Q/O accounts, or accounts with liquidity-saving features, were introduced in October 2008 as part of the RTGS-XG project. "Queuing" allows payment instructions to be held pending within the system if a participant sends a payment instruction but does not have sufficient funds to complete the transaction. The "offsetting" mechanism searches among the newly entered and queued payment instructions for a set of instructions that can be settled when taking into account incoming funds as a source of liquidity, and settles the selected instructions simultaneously. The bilateral offsetting algorithm searches for a pair of offsetting instructions when certain events occur, including when a new payment instruction enters a system or when there is a change in Q/O account balances. The multilateral offsetting algorithm attempts to find a group of offsetting transactions from all queued instructions at five fixed times each day. As of October 2011, about 280 BOJ-NET participants had opened Q/O accounts. The types of transaction settled on Q/O accounts include payments for money market transactions, large-value payments routed from the Zengin System, and payments submitted via the FXYCS.

The operating hours of the system are from 09:00 to 17:00 for all participants and from 09:00 to 19:00 for those that have made an advance application for routine access at the later hours. Q/O accounts and SPDC accounts are available from 09:00 to 16:30. Net positions stemming from privately owned clearing systems are settled on an RTGS basis at the following times: 12:30 for BCCS and 16:15 for the Zengin System (see Chart 2).

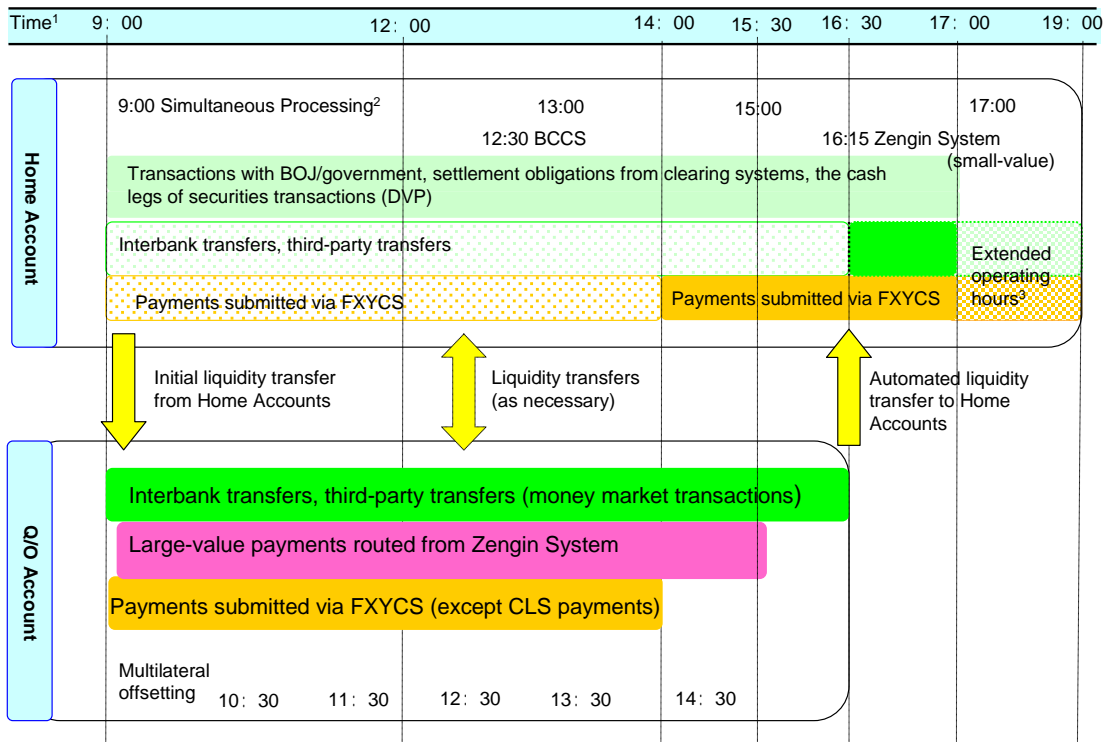
The Bank of Japan offers BOJ-NET FTS participants several ways to access the BOJ-NET, and participants can choose the way that best suits their operations. The majority of participants access the BOJ-NET through dedicated BOJ-NET terminals with a PC-based connection. However, as an alternative to uploading and downloading files over BOJ-NET terminals, participants can also use computer-to-computer connections to streamline

¹³ Financial institutions can hold current accounts with different offices (head office and regional branches) of the Bank of Japan.

¹⁴ An SPDC account is used for the settlement of the cash legs of JGB transactions. The SPDC facility allows the receiver of JGBs to pledge the incoming securities as collateral for intraday overdrafts, while using the overdrafts to pay for those incoming securities. See Section 4.4.1.

operations with a large volume of transactions. Most major financial institutions use such computer-to-computer connections.

Chart 2
Operational timeline of BOJ-NET FTS



¹ Due to the high volume of settlements, a special payment schedule and extended operating hours apply on the last business day of each month. ² Some BOJ-NET FTS participants' payments to and receipts from the Bank of Japan are netted out on a bilateral basis between participants and the Bank of Japan, and the resulting net settlement positions of participants are credited to or debited from their current accounts with the Bank of Japan simultaneously and independently at designated times. This settlement mode, called "simultaneous processing", takes place at 09:00, 13:00, 15:00 and 17:00. ³ Only for participants with access to the extended operating hours.

3.2.1.5 Risk management

The Bank of Japan provides an intraday overdraft facility in order to facilitate smooth settlement on an RTGS basis. Intraday overdrafts are available on Home Accounts and SPDC accounts without charge if repaid by the end of the day. Intraday overdrafts are fully collateralised with eligible assets pledged to the Bank of Japan. Collateral is marked to market with haircuts which vary according to the type of security and residual maturity. No quantitative limit is currently imposed on the amount of an intraday overdraft.

3.2.1.6 Pricing

Of the various costs associated with the operation of BOJ-NET, the costs of linking with the BOJ-NET and for using its circuits are borne by participants, which benefit from online processing through the BOJ-NET. On the other hand, the Bank of Japan bears the cost of upgrading its operational infrastructure, including expenditure on purchasing/leasing computers and programming the BOJ-NET.

BOJ-NET participants incur a monthly fixed charge and transaction fees. The fixed charge for linking with the BOJ-NET amounts to JPY 25,300–38,300 (USD 290–440) per line per month

for terminal connections and JPY 480,000–720,000 (USD 5,500–8,200) per line for computer-to-computer connections. Transaction fees for the BOJ-NET FTS are JPY 20–60 (USD 0.20–0.70): JPY 40 (USD 0.50) for ordinary funds transfers and JPY 60 (USD 0.70) for third-party funds transfers.¹⁵

3.2.1.7 Major ongoing and future projects

As the current BOJ-NET has been in use since 1988, the Bank of Japan is in the process of developing a replacement. The new BOJ-NET will use the latest information technology; employ a more flexible architecture to take account of future changes; and have enhanced accessibility to respond to changes in the financial environment such as the globalisation of financial markets and growing interconnectedness between payment and settlement infrastructures. It will provide basically the same functions as the current system through a new system infrastructure, while some selected functions will be improved, integrated or discontinued. The Bank of Japan is currently considering the adoption of ISO 20022 messages and extending the operating hours of the BOJ-NET. The new system will start operating for some areas of the Bank of Japan's business around fiscal 2013 and for the remaining areas around fiscal 2015.

3.2.2 Zengin Data Telecommunication System (Zengin System)

The Zengin System is an interbank clearing system for domestic retail credit transfers (see Chart 1). With the completion of the Next-Generation RTGS Project in November 2011, large-value payments (defined as payments equal to or larger than JPY 100 million) in the Zengin System are settled on an RTGS basis in BOJ-NET FTS. Payments smaller than JPY 100 million continue to be settled on a DNS basis, with participants' net positions calculated by the Zengin System and settled across the accounts that participants hold with the Bank of Japan. In 2010, the system handled a daily average volume of 5.6 million transactions, while the daily clearing value averaged JPY 10 trillion (USD 120 billion¹⁶).

3.2.2.1 Institutional framework

The Zengin System started operation in 1973 with Tokyo Bankers Association (TBA) as the operator. In October 2010, the Japanese Banks' Payment Clearing Network (Zengin-Net) took over the operations of the Zengin System from the TBA (see Section 1.3.1). The Zengin-Net is regulated as a *Central Counterparty Institution for Interbank Funds Transfer* under the *Payment Services Act (PSA)*. The PSA, which has been in effect since April 2010, stipulates that only bodies that have received a license from the Prime Minister can carry out *central counterparty clearing services for interbank funds transfer*.

Zengin-Net sets rules that govern the clearing procedures of the Zengin System. It is required to consult with the Bank of Japan if any revisions are needed to rules relating to settlement or membership criteria.

3.2.2.2 Participation

The Zengin System has a two-tiered participation structure. Direct participants settle their net positions through the accounts they hold with the Bank of Japan, while indirect participants appoint direct participants to settle their net positions on their behalf. Financial institutions such as banks and branches of foreign banks in Japan participate directly in the Zengin System, and smaller financial institutions, such as cooperative financial institutions, participate in the system as indirect participants. At the end of 2010, 1,372 institutions

¹⁵ Converted at yearly average JPY/USD exchange rates for 2010.

participated in the system, of which 141 were direct participants. End users include firms and individuals.

3.2.2.3 *Types of transaction*

The Zengin System primarily clears credit transfers between two customers that hold accounts at different financial institutions. Other types of transaction handled by the system include payments resulting from the inter-regional collection of bills and cheques.

3.2.2.4 *Operation of the system and settlement procedures*

Small-value payments

Payments under JPY 100 million are processed through the Zengin System as follows (see Chart 3 below):

1. The payer instructs its sending bank to make a payment to the payee at the receiving bank.
2. The sending bank debits the payer's account.
3. The sending bank sends a transfer message to the Zengin System, which in turn sends the message to the receiving bank between 08:30 and 15:30. At the same time and on a transaction-by-transaction basis, the obligation between sending bank and receiving bank is replaced by two obligations: one between sending bank and Zengin-Net, and the other between receiving bank and Zengin-Net.
4. Upon receiving the message, the receiving bank usually credits the payee's account.
5. The net debit or credit positions between each participant and Zengin-Net are calculated within the system.
6. The Zengin System sends information on participants' net positions to the BOJ-NET FTS using the Zengin System network.
7. The net positions are settled through the BOJ-NET FTS at 16:15.¹⁶ Funds are first transferred from the accounts of Zengin System participants with net debit positions to the Zengin-Net's account and, after completion of such transfers, the funds are then transferred from the Zengin-Net's account to the accounts of participants with net credit positions. Interbank settlement is final once the net positions of participants are settled through the BOJ-NET FTS.

Large-value payments

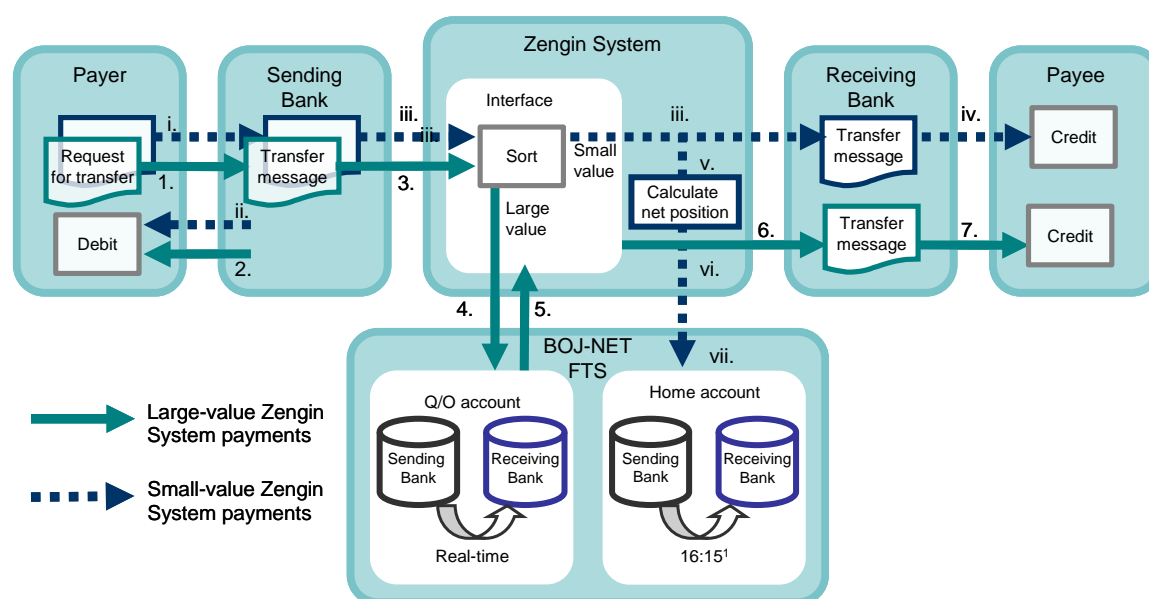
Payments of JPY 100 million and more are processed through the Zengin System in the following manner (see Chart 3 below):

1. The payer instructs its sending bank to make a payment to the payee at the receiving bank.
2. The sending bank debits the payer's account.
3. The sending bank sends a transfer message to the Zengin System.

¹⁶ Due to the high volume of instructions flowing through the Zengin System, settlement on the last business day of each month takes place at 17:15 with the window for exchange of transfer messages extended to 16:30, and settlement on the last business day of the year takes place at 16:45 with the window for exchange of transfer messages extended to 16:00.

4. The Zengin System identifies a “large-value” payment and routes the interbank settlement information to the BOJ-NET FTS.
5. The Bank of Japan debits the sending bank’s Q/O account and credits the receiving bank’s Q/O account (see Section 3.2.1.4).
6. After receiving the notice of funds transfer from the BOJ-NET FTS, the Zengin System sends the full transfer message to the receiving bank.
7. The receiving bank credits the payee’s account.

Chart 3
Settlement process in the Zengin System



¹ Funds are transferred via the account held by the Zengin-Net with the Bank of Japan.

3.2.2.5 Risk management

For small-value payments of less than JPY 100 million, Zengin-Net acts as the CCP, and the obligations between participants are replaced by those between participants and Zengin-Net.

Each participant has a sender net debit cap, which indicates the maximum level of exposure the participant can pose to the system. Each participant is required to deposit collateral equivalent to its sender net debit cap with Zengin-Net. Each participant can substitute guarantees from other participants (“guarantor banks”) for all or part of the collateral. Guarantor banks need to deposit collateral with Zengin-Net to cover the two largest guarantees they give.

Should a participant fail to settle its net obligation, Zengin-Net completes the settlement after obtaining the necessary liquidity from banks designated in advance as “liquidity provider banks”. Under this arrangement, the 25 banks designated as liquidity provider banks would be able to cover a default by the two participants with the largest sender net debit caps. In order to repay liquidity provider banks for funds provided in an emergency, Zengin-Net can liquidate the collateral deposited by the defaulting participant. When guarantees are substituted for the defaulting participant’s collateral, the guarantor banks for that participant will provide funds to repay liquidity provider banks.

Participants in the Zengin System exchange transfer messages electronically via relay computers (RCs), which are installed either by participants or by joint centres for certain groups of financial institutions including various cooperatives.

The computer facility for the Zengin System has been updated to meet the need for increased capacity. The current computer facility, which has been in use since November 2011, is the sixth-generation facility. For operational resiliency, two main computer centres have operated separately in Tokyo and Osaka since 1987 as mutual backup facilities.

3.2.2.6 Pricing

Each participant pays an admission fee to Zengin-Net upon joining the Zengin System. The (i) operational costs of the Zengin Center, (ii) communication costs and (iii) 20% of the operational costs of each RC are borne by participants in proportion to the volume and value of their transactions. The remaining 80% of RC costs are borne by each participant that uses each RC.

3.2.3 Foreign Exchange Yen Clearing System (FXYCS)

The FXYCS was established in 1980 to facilitate the clearing of cross-border yen payments (see Chart 1). Until October 2008, the FXYCS had two settlement modes, a DNS mode and an RTGS mode. With the implementation of Phase 1 of the next-generation RTGS project, the DNS mode of the FXYCS was abolished and all FXYCS payments moved to settlement on an RTGS basis in the BOJ-NET FTS. In 2010, the system handled a daily average volume of 26,000 transactions, while the daily clearing value averaged JPY 12 trillion (USD 130 billion¹⁷).

3.2.3.1 Institutional framework

The FXYCS is owned and operated by the JBA (see Section 1.3.1). The JBA has delegated the operation of the IT system to the Bank of Japan and the processing of instructions takes place on the BOJ-NET system. The Prime Minister and the Minister of Finance have authorised the Bank of Japan to operate the FXYCS as a business that contributes to the smooth settlement of funds (see Section 1.1.1.3). The JBA lays down rules for the FXYCS that stipulate membership criteria, procedures for entry and withdrawal, and procedures for exchanging payment instructions. Any revision to the rules requires the Bank of Japan's approval.

3.2.3.2 Participation

At the end of 2010, 207 financial institutions, including 58 branches of foreign banks in Japan and CLS Bank, participated in the FXYCS. Of these, 28 were direct participants that access the BOJ-NET FTS directly, and the other 178 were indirect participants that participate in the system through direct participants. CLS Bank also has access to the BOJ-NET FTS and participates in the system with a special status short of full membership.

3.2.3.3 Types of transaction

The FXYCS handles yen payments resulting from foreign exchange transactions, yen-denominated bond transactions, transactions in the Euroyen market, as well as cross-border customer payments such as export-import payments. The FXYCS is also used to settle pay-ins and pay-outs between CLS Bank and CLS settlement members/nostro banks for the yen.

¹⁷ Converted at yearly average JPY/USD exchange rates for 2010.

3.2.3.4 Operation of the system and settlement procedures

Payments are settled on an RTGS basis in BOJ-NET FTS. Payment instructions can be submitted from 09:00 to 14:00 for RTGS with liquidity-saving features and until 17:00 for RTGS without liquidity-saving features. For the latter case, participants are allowed to submit instructions until 19:00 provided that they have applied in advance for late access.

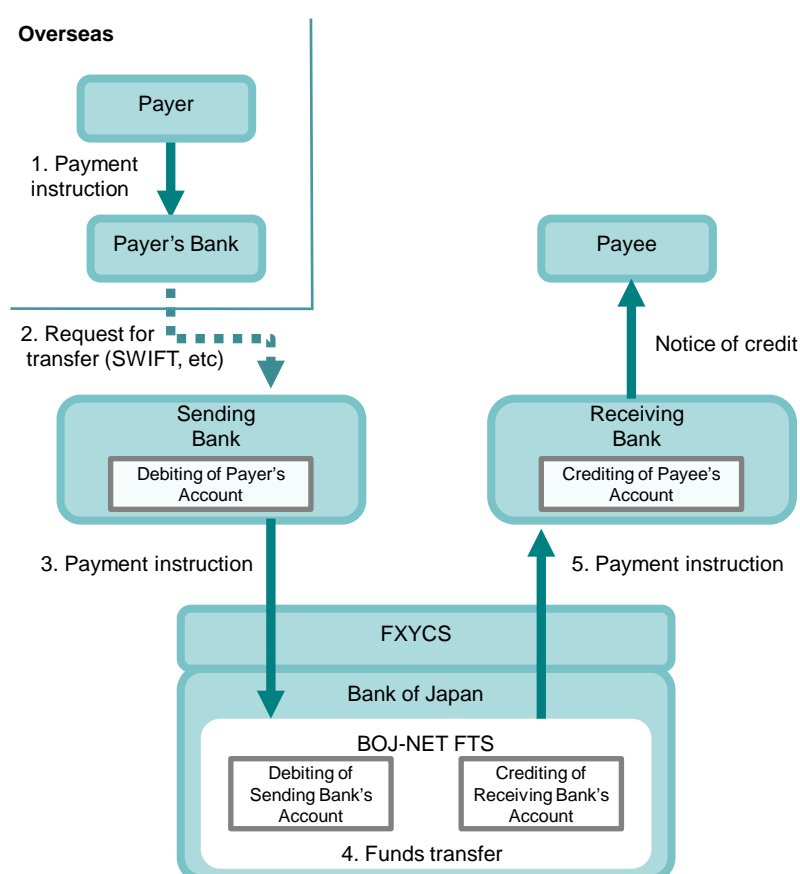
Direct participants in the FXYCS access the system through BOJ-NET terminals installed on their premises. A direct connection between participants' host computers and the BOJ-NET host computer (computer-to-computer connection) is also available.

The following shows how payments are processed through the FXYCS (see Chart 4 below):

1. The payer in a foreign country instructs its bank to make a yen payment to the payee in Japan.
2. The payer's bank requests a funds transfer, mainly using SWIFT, to its correspondent bank (the sending bank) in Japan.
3. The sending bank sends a payment instruction to the BOJ-NET FTS via FXYCS.
4. Upon receiving the instruction, the Bank of Japan debits the amount specified in the payment instruction from the sending bank's account and credits the receiving bank's account.
5. The receiving bank credits the account of the payee.

Chart 4

Foreign Exchange Yen Clearing System



3.2.3.5 Risk management

Payments submitted to the FXYCS are settled on an RTGS basis in the BOJ-NET FTS. The rules governing the FXYCS states that all payments should in principle be submitted for settlement through accounts at the Bank of Japan with liquidity-saving features (Q/O accounts), with the exception of pay-ins and pay-outs for CLS which are settled on accounts without liquidity-saving features (see Section 3.2.1). To facilitate interbank payments and the subsequent crediting of customer accounts, the JBA has set rules that require participants to send instructions by 14:00 when using Q/O accounts. For the same reason, participants are required to send and settle, 65% of the daily volume and 55% of the daily value of payments eligible for settlement on Q/O accounts by 11:00.

3.2.3.6 Pricing policies

Financial institutions that are not members of the JBA but still use FXYCS pay admission fees to the JBA. Direct participants bear 90% of the annual operating costs, 20% of which is borne equally among them and 80% in proportion to the value of their transactions in the previous fiscal year. Indirect participants and the CLS Bank bear the remaining 10% of operating costs in equal shares.

3.2.4 Bill and cheque clearing systems (BCCS) / Tokyo Clearing House

BCCS allow financial institutions located in the same geographical area to present bills and cheques and to calculate their multilateral net positions at local clearing houses (see Chart 1). There is a long-term shift away from bills and cheques in favour of credit transfers in the Zengin System as businesses seek to avoid the cost of stamp tax¹⁸ and the cost of handling paper-based bills and cheques. As a result, the daily average value of bills and cheques processed has been trending downward since around 1990. As of January 2011, there were 243 bill and cheque clearing houses throughout Japan. The Tokyo Clearing House (TCH), which is the largest of Japan's BCCS and handles approximately 70% of bills and cheques nationwide, cleared a daily average value of JPY 1.1 trillion (USD 13 billion¹⁹) in 2010.

3.2.4.1 Institutional framework

With the exception of the TCH, which is operated by the JBA (see Section 1.3.1), the major clearing houses are owned and operated by the regional bankers' associations. Of the 243 BCCS throughout Japan, 121 have been designated by the Minister of Justice.²⁰

Although each clearing house sets its own rules, clearing houses have been encouraged to harmonise their rules to enhance the efficiency of liquidity management by financial institutions. For example, the standard settlement time of 12:30 has been adopted. Any revision to the rules of clearing houses that use central bank accounts for settlement requires the Bank of Japan's approval.

3.2.4.2 Participation

Large and medium-sized financial institutions including banks and branches of foreign banks in Japan participate in BCCS directly. Small financial institutions participate in BCCS

¹⁸ A form of tax collected by requiring a stamp to be purchased and affixed to legal documents and publications.

¹⁹ Converted at yearly average JPY/USD exchange rates for 2010.

²⁰ According to the Bill Act and the Cheque Act, presentation of bills and cheques at designated clearing houses is deemed a means of presentation for payment. Presentation of bills and cheques at non-designated clearing houses is also deemed a means of presentation for payment under agreements between the relevant parties.

indirectly through direct participants. As of December 2010, 323 institutions participated in the TCH, of which 105 were direct participants.

3.2.4.3 *Types of transaction*

BCCS mainly handle bills and cheques used for commercial transactions between firms. They also handle bills and cheques used for financial transactions.

3.2.4.4 *Operation of the system and settlement procedures*

Bills and cheques are cleared in the following manner: (1) bills and cheques are presented by payees at payees' banks; (2) bills and cheques are physically delivered and exchanged between participating banks at clearing houses; (3) the net positions of participating banks are calculated at the clearing houses; and (4) payers' banks bring back bills and cheques from the clearing houses. The net positions of participants calculated by each clearing house are settled at the settlement bank designated by the clearing house.

In the case of the 33 major clearing houses, settlement of participants' net positions takes place through the current accounts held by their respective regional bankers' associations with the Bank of Japan. Funds are first transferred from the accounts of participants with net debit positions to the account of the regional bankers' association and, after these transfers are completed, the funds are paid from the account of the regional bankers' association to the accounts of participants with net credit positions. This process is performed through the BOJ-NET FTS at 12:30 (see Section 3.2.1.4). Interbank settlement is final once the net positions of participants are settled through the BOJ-NET FTS. In general, however, the payee cannot withdraw funds until 13:00 on the business day following interbank settlement because dishonoured bills or cheques may be returned from the payer's bank to the payee's bank until 11:00 on that day.

3.2.4.5 *Risk management*

There is no limit placed upon the size of the net debit position of each participant. Should a participant fail to settle its net obligation, the clearing house is expected to promptly exclude transactions involving the defaulting participant and then recalculate the net positions of the remaining participants.

3.2.4.6 *Pricing*

In the case of the TCH, a financial institution that is not a member of the Tokyo Bankers Council pays an admission fee to become a participant in the TCH. Participants bear the operating costs of the TCH in proportion to the volume and value of their transactions during the previous fiscal year.

3.2.4.7 *Major ongoing and future projects*

A new type of instrument known as electronically recorded monetary claims has been created under the *Electronically Recorded Monetary Claims Act*, which came into force in December 2008. Electronically recorded monetary claims function in a similar way to bills as a means of financing for businesses, particularly small and medium-sized enterprises. At the same time, they eliminate the shortcomings associated with paper-based bills, which include custody costs, risk of loss, and their eligibility for stamp tax. Electronically recorded monetary claims are managed by Electronic Monetary Claim Recording Institutions in which the accruals and assignments of claims are recorded electronically. There are currently four Electronic Monetary Claim Recording Institutions in Japan: (i) the Japan Electronic Monetary Claim Organization (JEMCO) operated by the Bank of Tokyo-Mitsubishi UFJ, which started operations in 2009; (ii) the SMBC Electronic Monetary Claims Recording Co., Ltd operated by Sumitomo Mitsui Banking Corporation, which started operations in 2010; (iii) the Mizuho Electronic Monetary Claim Recording Co., Ltd operated by Mizuho Bank, which started

operations in 2010; and (iv) densai.net Co.,Ltd. to be operated by the JBA once it launches operations in 2012.

4. Systems for post-trade processing, clearing and securities settlement

4.1 General overview

There are two major CSDs in Japan. The Bank of Japan is responsible for JGBs and the Japan Securities Depository Center (JASDEC) is responsible for securities other than JGBs, including stocks, corporate bonds, commercial paper, municipal bonds, convertible bonds, investment trusts, ETFs and REITs (see Chart 1).

With the establishment of a uniform securities settlement framework, various categories of these securities have been dematerialised in JASDEC, and DVP mechanisms were adopted in a phased approach in the 2000s. For commercial paper, corporate and other bonds (municipal bonds, government-guaranteed bonds) and investment trusts, full dematerialisation was achieved in March 2003, January 2006 and January 2007, respectively. At the same time that dematerialisation was implemented, JASDEC also introduced DVP by linking individual deliveries of securities through JASDEC's Book-entry Transfer System with corresponding payments at the Bank of Japan. For stocks, DVP was achieved in a phased approach; for street-side transactions on exchanges in May 2001, for customer-side transactions in May 2004, and for stock issuance in January 2009. Full dematerialisation was achieved for stocks in January 2009.

JGB transactions are settled on a real-time DVP basis through BOJ-NET JGB Services, an online system for transferring JGBs between financial institutions. The DVP system was introduced in April 1994 and migrated to a real-time DVP system in January 2001 when the funds transfer service in the BOJ-NET Funds Transfer System (BOJ-NET FTS) also shifted to RTGS. Dematerialisation of JGBs was achieved in January 2003.

To mitigate settlement risk in securities transactions, the *Securities and Exchange Act* was amended in June 2002 to add in provisions regarding a central counterparty. After 2002, based on this amendment, CCPs were successively established in Japan. For example, the Japan Securities Clearing Corporation (JSCC) was established in 2002 as a uniform clearing institution for all securities exchanges in Japan. Prior to the establishment of the JSCC, clearing of stock transactions was carried out internally at individual exchanges. In addition, the JGBCC was established in 2003 to reduce the amount of JGB settlement under the BOJ-NET's real-time DVP system and to mitigate counterparty risk in JGB transactions. The JASDEC DVP Clearing Corporation (JDCC) was established in 2003 for customer-side transactions in securities settled in JASDEC. The Tokyo Financial Exchange (TFX) and Osaka Securities Exchange (OSE) internally clear transactions in listed derivatives, FX derivatives (retail margin trading of FX) and others. The *Financial Instruments and Exchange Act* (FIEA) came into force in September 2007 and thereafter the Act covers all central clearing businesses.

4.2 Post-trade processing systems

4.2.1 Pre-Settlement Matching System (PSMS) at JASDEC

4.2.1.1 Institutional framework

JASDEC began operating the PSMS in September 2001 to modernise and automate the matching process for various types of securities transactions. Pre-settlement matching is one of JASDEC's main businesses (see Section 4.4.2).

4.2.1.2 Participation

The PSMS is designed to work for trade matching and settlement matching process for both domestic and cross-border transactions. Users of the PSMS include securities firms, investment trusts, investment advisory firms, trust banks, custodian banks, life insurance firms and other insurance firms. Any business entity that meets a given set of requirements can, with the approval of JASDEC, acquire admissions from JASDEC and use the PSMS. There were 698 registered company users at the end of October 2011.

4.2.1.3 Types of transaction

The scope of securities and transactions covered by the PSMS is as follows.

(i) Domestic transactions

The PSMS provides trade matching and settlement matching services for domestic outright and securities financing transactions such as repo and lending and borrowing in stocks, corporate bonds, convertible bonds, JGBs, listed derivatives, commercial paper and share options.

(ii) Non-residents' transactions

The PSMS provides settlement matching services for cross-border transactions in stocks, corporate bonds, convertible bonds, JGBs and commercial paper.

4.2.1.4 Operation of the system

After accepting trade report data, the PSMS matches the trade details with the investment instructions sent from the investment managers and generates settlement instruction data. Subsequently the settlement instruction data for JASDEC eligible securities are transmitted to the JASDEC's Book-entry Transfer Systems, and finally settled by DVP through the linkage between the systems and the Bank of Japan's BOJ-NET FTS (see 4.4.2). For JGBCC eligible transactions, matched transaction data are automatically transmitted to the JGBCC (see Chart 1).

The operating hours of the PSMS are from 07:00 to 22:00.

4.2.1.5 Pricing

The PSMS system fee includes a fixed fee for participation and a variable fee proportional to the volume of transactions.

4.3 Central counterparties and clearing systems

4.3.1 Japan Securities Clearing Corporation (JSCC)

4.3.1.1 Institutional framework

The JSCC was established in July 2002 as the first nationwide central counterparty in the Japanese securities market integrating internalised clearing functions in multiple securities exchanges, and started clearing operations in January 2003. The JSCC clears transactions at Japan's six stock exchanges: the TSE, OSE, Nagoya Stock Exchange, Sapporo Securities Exchange, Fukuoka Stock Exchange and TOKYO AIM. The JSCC also clears transactions at two PTS: Japannext and Chi-X JAPAN. The JSCC launched a clearing service for iTraxx Japan index CDS in July 2011.

The JSCC issued Class A shares related to the clearing business of exchanged-traded transactions, as well as Class B shares related to the clearing business of OTC CDS transactions. The shareholders of Class A shares are Japan's five stock exchanges. The major shareholder is the Tokyo Stock Exchange Group (TSEG) of which the JSCC is a subsidiary. The shareholder of Class B shares is the TSEG.

4.3.1.2 Participation

The JSCC had 152 participants as of March 2011. Two-thirds of the participants are securities firms and the remainder are banks. The five types of clearing qualification are categorised according to tradable asset class: they comprise four for exchanged-traded transactions (Cash Products, Government Bond Futures and Futures Options, Index Futures and Options, and Individual Options), and one for OTC derivatives transactions (CDS).

The clearing qualifications for exchange-traded transactions are subdivided into Principal Clearing Qualifications and Agency Clearing Qualifications. Holders of the Principal Clearing Qualification may settle only their own transactions, while Agency Clearing Qualification holders can settle the transactions of non-clearing participants as well as their own.

The JSCC sets criteria for obtaining and maintaining qualifications, and regularly monitors participants on their management practices, operational reliability and financial standing. If a participant is observed to have significant problems in these areas, the JSCC has the right to suspend its assumption of the participant's obligations and to revoke the participant's qualifications. The JSCC can also raise margin requirements and require participants to reduce their positions when it judges that participants' positions carry excessive risk compared to their net assets and liquid assets.

The financial requirements for the acquisition of qualifications are higher than those for maintaining qualifications, and those for the agency clearing qualification are higher than those for the principal clearing qualification. These requirements are set for each type of institution. For example, the financial requirements for securities companies seeking to acquire the principal clearing qualification are (i) capital of over JPY 300 million; (ii) net assets of more than JPY 2 billion; and (iii) a capital-to-risk ratio of more than 200%.

4.3.1.3 Types of transaction

Clearing products comprise five asset classes: (i) cash products comprising stocks, convertible bonds, investment trusts, ETFs and REITs; (ii) JGB futures and futures options; (iii) stock index futures and options; (iv) equity options; and (v) index CDS. JSCC provides clearing services for all cash products including stocks, convertible bonds, ETFs and REITs traded at six stock exchanges, stocks traded at two PTS, index CDS traded in the OTC market, as well as derivatives listed on the TSE.

4.3.1.4 Operation of the system

The JSCC assumes participants' obligations and guarantees settlements. Assumption of obligations for exchange-traded transactions is conducted at the timing of every trade execution, and the assumption of obligations for CDS transactions is conducted once a week. While the JSCC carries out netting on a product-by-product basis for each participant, the amount of cash payment is netted out across products. Instructions for the securities to be transferred on a net basis are sent to JASDEC, and the funds transfer instructions on a net basis are sent to either a settlement bank or the Bank of Japan. The JSCC designates six commercial banks for cash settlement (see Chart 1).

DVP settlement is conducted through these settlement facilities on a cooperative basis. When settling cash products, participants transfer securities to a JSCC account with JASDEC by 13:00 and receive securities from a JSCC account by 14:15. Participants pay into a JSCC account with the settlement bank by 13:00 and the JSCC pays out at 14:45. This schedule allows the JSCC to (i) hold net funds until it receives the corresponding net amount of securities; and (ii) hold the net amount of securities until it receives the corresponding net funds, which obviates the need for JSCC to take on principal risk in net-net DVP (DVP3). Paid-in cash and securities transferred in advance serve as collateral, and participants can obtain securities earlier by pledging additional collateral beyond what they have to pay in, given that net-net DVP is carried out sequentially in an intraday batch system. On the other

hand, early payout is not possible. Participants settle funds using their current accounts at the Bank of Japan or settlement banks.

4.3.1.5 Risk management

The JSCC has introduced various risk management tools to protect against any default of its participants. They are categorised into three mechanisms: participant qualifications, liquidity funding and the loss allocation arrangement.

First, the JSCC has established rigorous qualifications for participation (see Section 4.3.1.2). Second, the JSCC maintains liquidity provision agreements with cash settlement banks to secure short-term liquidity enabling it to deal with potential default of participants. Finally, if the JSCC incurs loss as the result of a participant's default, financial resources will be used in the following order for exchange-traded transactions: (i) collateral including the "clearing fund" as an initial margin posted by the defaulting participant; (ii) default compensation by stock exchanges and PTS; (iii) compensation by the JSCC; and (iv) loss-sharing among non-defaulting participants. For CDS transactions, the loss allocation will take place in the following order: (i) collateral pledged by the defaulting participant; (ii) the first compensation by the JSCC; (iii) the default fund of non-defaulting participants and the second compensation by the JSCC; (iv) limited loss-sharing among non-defaulting participants; (v) compensation by non-defaulters with net gain in the accumulated amount of variation margin after the default of the participant, and others.

Participants' positions are monitored, and the JSCC has the right to either raise the requirement of collateral or require that positions be reduced.

To improve operational robustness, the JSCC introduced a backup centre in 2008 and a third office in 2009 in accordance with its business continuity plan. The JSCC has also enhanced the processing capacity of clearing systems on an annual basis in line with the growth in transaction volumes.

4.3.1.6 Links to other systems

The JSCC has links to the BOJ-NET FTS and the JASDEC Book-entry System to ensure DVP settlement. The JSCC does not have cross-margin arrangements across CCPs and does not maintain cross-border arrangements or clearing links with overseas securities settlement systems (see Chart 1).

4.3.1.7 Pricing

The JSCC charges clearing fees for cash securities based on both transaction amount and volume. Previously, fees were charged according to the value of transactions alone, but the JSCC changed its pricing policy to a dual fee system in 2006 and gradually began placing a larger weight on transaction volume because recent increases in small orders at exchanges had resulted in more costly system investments. For exchange-traded derivatives, the fee system changed completely from a transaction amount basis to a volume basis in 2009. Clearing fees for CDS transactions are based on the notional amount.

4.3.1.8 Major ongoing and future projects

The JSCC plans to provide clearing services for OTC derivatives of interest rate swaps and credit default swaps. The JSCC has set up a "Working Group on Clearing Operations for OTC Derivatives Trades" and is designing a specific operating model and system structure. Among these projects, the clearing service for iTraxx Japan started in July 2011.

4.3.2 JASDEC DVP Clearing Corporation (JDCC)

4.3.2.1 Institutional framework

The JDCC was established by JASDEC in June 2003 to achieve DVP settlement for customer-side transactions (transactions between securities dealers and institutional investors). In April 2004, the JDCC was licensed as a clearing organisation in Japan to assume participants' obligations. The JDCC started operations in May 2004. The JDCC is a wholly owned subsidiary of JASDEC.

4.3.2.2 Participation

The JDCC sets out eligibility criteria for participation ("participation criteria") specifying that an applicant must: (i) have a JASDEC account and access to its pre-settlement matching system "PSMS"; (ii) be of sound financial condition, which is assessed based on the size of capital, the size of net assets and the capital requirement ratio applicable for the specific type of financial institution including securities firms, banks and insurance companies; and (3) have sound management practices and appropriate business operations.

The JDCC currently has approximately 60 participants comprising securities firms and institutional investors such as trust banks and custodian banks.

The JDCC also defines suspension criteria and regularly monitors participants for their financial standing and ability to conduct business. If there are significant problems that might trigger the suspension criteria, the JDCC has the right to suspend its assumption of participants' obligations and to revoke participants' qualifications. Participation requirements are set at a higher level than suspension criteria.

4.3.2.3 Types of transaction

The JDCC provides the clearing services for customer-side transactions in (i) stocks etc eligible for the JASDEC book-entry transfer business, namely stocks, stock acquisition rights, corporate bonds with stock acquisition rights, investment units, preferred equity investments, investment trust beneficial rights, and other beneficial rights, as well as (ii) foreign stock certificates etc handled by JASDEC.

4.3.2.4 Operation of the system

The JDCC assumes participants' obligations until 13:50 on the settlement day provided that the order satisfies the "transfer conditions" given under the risk management scheme (see below). DVP settlement is executed on a gross-net basis (DVP2). That is, accepted orders are netted and all settlement amounts are fixed at 14:00. Net cash paying participants must complete payment to the JDCC by 15:10 (pay-in). After the payment of settlement amounts from all paying participants, the JDCC makes payments to net cash receiving participants until 15:30 (payout). Meanwhile, transfers of securities are sequentially executed on a gross basis provided that the DVP transfer order satisfies the "transfer conditions" for transfers from participants to the JDCC and the "completion conditions" for transfers from the JDCC to participants. The cut-off time for transfers from participants to the JDCC is 14:00, prior to net cash payments. The JDCC transfers securities to participants by 15:10.

The transfer conditions allowing for the assumption of obligations comprise three requirements: (i) the net payment amount is less than or equal to the assets held by the JDCC; (ii) the net payment amount is less than or equal to the upper limit given by the JDCC; and (iii) the outstanding amount of securities held by a transferring participant, including

securities which will be received on the same settlement day,²¹ is sufficient to complete the transfer. The abovementioned assets held by the JDCC comprise: (i) securities which have been delivered to the JDCC but have not yet been received by the net paying participant (so-called securities-to-be-received); and (ii) collateral securities (pledged securities) and cash deposits (within the participants' fund and the settlement facilitation payment) both posted by the net paying participant. In sum, the JDCC utilises these securities as collateral for the scheduled payment from the participant, and any shortfall in the value of collateral due to a haircut is made up for by prefunded securities and cash.

The completion conditions also comprise three requirements. Gross settlements of securities are executed sequentially once any one of these requirements is satisfied, namely: (i) a securities receiver is identified to be a net receiver of the payment; (ii) a securities receiver is identified to be a net payer and the payment is completed; and (iii) in the event that securities that will be received are due to be transferred onwards to other participants, the second transfer order satisfies the transfer conditions.

Participants settle funds using their current accounts at the Bank of Japan or their settling banks' current accounts at the Bank of Japan (see Chart 1).

4.3.2.5 Risk management

Risk management scheme

The JDCC has introduced various structures to mitigate credit and liquidity risk. The transfer conditions described above represent the principal means of mitigating credit and liquidity risks. This section shows how the three requirements comprising the conditions work from the risk management perspective.

(i) Collateral assets to cover failure of payment

The JDCC requires participants to ensure that the net payment amount is less than or equal to the assets held by the JDCC as already posted or to be received by the paying participant in question. If a paying participant fails to pay, these assets are used to compensate the JDCC for any loss it suffers as a result of the failure. As the securities held by the JDCC that are scheduled to be transferred to the defaulting participant serve as collateral, and as the time from the assumption of transfer orders to settlement is very short, ie a few hours, the JDCC does not require a margin. The value of collateral securities is set by applying a deep haircut to the previous day's market price. The JDCC also uses supplementary cash deposits and collateral securities. Since securities are transferred from participants to the JDCC on a gross basis prior to net cash payments, the collateral is always secured for the JDCC.

(ii) Limit on the net payment amount

Because the JDCC sets a limit on the net payment amount of an individual participant, the JDCC's exposure in the event of the failure of a single participant is capped at this limit. This serves to limit the JDCC's liquidity funding needs in the event of a participant's failure to pay. To satisfy liquidity funding needs, the JDCC has credit lines from banks and can use cash deposits from participants, the participants' funds.²²

(iii) Outstanding amount of transferable securities

²¹ These refer to securities balances which have been delivered to JDCC and are due to be received by the transferring participant.

²² By disposing of the holding assets of the defaulting participant, the JDCC (i) repays bank lending and (ii) restores the balance of the participants' fund.

The JDCC requires the transferring participant to maintain a securities balance greater than the volume of securities required for transfer. This requirement prevents the JDCC from being exposed to participants' failure to settle ex ante.

Loss allocation scheme

Cash deposits from defaulting participants are the first source of loss allocation and disposals of their securities collateral are the second. Large potential losses can exceed the sum of these two sources, even though securities collateral is deeply discounted with a high haircut ratio. In this case, transferring participants that are original counterparties of the defaulting participant must share the remaining loss in proportion to their settlement amount with the defaulting participant. If a participant with this obligation cannot fulfil the obligation, the participant is considered to have failed to settle and all other participants must share the residual loss.

4.3.2.6 Links to other systems

The JDCC has links to the BOJ-NET FTS and the JASDEC Book-entry System to ensure DVP settlement. The JDCC does not have cross-margin arrangements across CCPs and does not maintain cross-border arrangements or clearing links with overseas securities settlement systems.

4.3.2.7 Pricing

The JDCC charges its participants user fees based on their transaction volume and a fixed minimum charge.

4.3.2.8 Major ongoing and future projects

To support DVP settlement for stock lending transactions, the JDCC and JASDEC are cooperating with a working group of their participants to discuss a possible settlement scheme for stock lending transactions. The DVP settlement outline was fixed in 2011, and operations are expected to begin in 2014.

4.3.3 Japan Government Bond Clearing Corporation (JGBCC)

4.3.3.1 Institutional framework

The JGBCC was established in October 2003 as a central counterparty for Japanese government bonds and started clearing operations in May 2005. The backdrop to its establishment was the change in the settlement method of BOJ-NET JGB Services from DNS to RTGS in 2001. The JGBCC requires clearing participants to be shareholders of the JGBCC. Previously, the JGBCC was wholly owned by its participants. Since September 2010, 35.6% has been owned by the JSCC and the rest by the participants.

4.3.3.2 Participation

As of August 2011, the JGBCC had 35 clearing participants comprising 25 securities firms, five banks, three money market brokers and two other financial institutions.

The JGBCC sets the criteria by which participants obtain and maintain their qualifications and it regularly monitors participants on their management practices, operational reliability, and financial standing. The JGBCC delegates the monitoring of participants' financial standing to the JSCC with a view to easing the burden on participants that participate in both CCPs. The financial requirements for acquiring qualifications are higher than those for maintaining them. These requirements are set for each type of institution. For example, the financial requirements for securities companies seeking to acquire qualifications are (i) capital of not less than JPY 300 million; (ii) net assets of not less than JPY 5 billion; and (iii) a capital-to-risk ratio of more than 200%.

The JGBCC has the right to suspend its assumption of participants' obligations and to revoke their qualifications.

4.3.3.3 *Types of transaction*

The JGBCC clears outright and repo transactions in JGBs that are executed between participants in the OTC market. The term of repo transactions subject to clearing by the JGBCC is less than one year. The types of JGB eligible for clearing include FBs (Financing Bills), TBs (Treasury Bills), interest-bearing bonds, discount bonds, floating rate bonds and STRIPs (Separate Trading of Registered Interest and Principal of Securities).

4.3.3.4 *Operation of the system*

The clearing process is as follows (see Chart 1).

1. A seller and a buyer of a JGB transaction transmit trade data to the matching system, PSMS, operated by JASDEC.
2. PSMS matches and confirms the trade information and sends the confirmation results to the JGBCC.
3. At 18:30 on the trade date, the JGBCC assumes participants' obligations, and becomes the seller to every buyer and the buyer to every seller.
4. Transactions between the JGBCC and each participant are netted into one position by the type of security and by settlement date. As the standard settlement cycle for JGBs is T+2, the JGBCC typically takes on counterparty risk for two days for an outright trade.
5. The JGBCC notifies participants of the net positions and the settlement details for the following day.
6. On the settlement date, both the seller and the buyer settle their resulting net positions on a DVP basis through the BOJ-NET FTS and BOJ-NET JGB Services using the simultaneous processing of DVP and collateralisation (SPDC) function (see Section 4.4.1). There are two steps involved in DVP settlement. In the first step, the seller delivers JGBs to the JGBCC, which pledges them to the Bank of Japan as collateral for an intraday overdraft. At the same time, the JGBCC pays for the JGBs received from the seller with the funds provided by the overdraft. In the second step, the buyer makes its payment for the JGBs to the JGBCC, which in turn repays the intraday overdraft to the Bank of Japan using the payment so received. At the same time, the JGBCC receives the pledged JGBs from the Bank of Japan and delivers the JGBs to the buyer. In the collateralisation process, the amount of the haircut is offset by the collateral pledged to the Bank of Japan in advance.

By using RTGS systems for settlement of both funds and securities, the JGBCC adopts gross-gross DVP (DVP1), with net positions of both funds and securities calculated for each type of securities. The JGBCC sets the deadlines for DVP1 and DVP2 at 13:30 and 14:00, respectively. In practice, however, settlement of almost all net positions is completed in the morning in line with the market guidelines for settlement of JGB transactions.

Funds only settlement (FOS) takes place over the BOJ-NET FTS. Variation margin calls comprise a major part of FOS. Market prices are used as the clearing prices for individual securities, and differences between trade prices and clearing prices are adjusted in FOS.

4.3.3.5 *Risk management*

The JGBCC has various procedures to mitigate credit and liquidity risk. In the event that the defaulting participant's "clearing fund deposits" as initial margin are insufficient to cover the loss, the following financial resources are applied: (i) funds from participants who are original counterparties of the defaulting participant to share the remaining loss in proportion to their

net settlement amount with the defaulting participant; (ii) a quarter of the retained earnings of the JGBCC; and (iii) additional funds from all non-defaulting participants.

The clearing fund as initial margin plays a key role in covering any loss that may arise from the default of a participant. The margin calculation method is therefore set conservatively with some backups against volatility in both prices and positions. The amount of initial margin is subject to downward rigidity such that once the amount of the initial margin goes up due to a rise in price volatility and/or an increased position, the highest watermark continues to hold for a substantial period of time. In addition, the required amount based on daily figures is designed to cover the average of recent peak values in these figures. The first-loss sharing scheme (that is, participants who are original counterparties of the defaulting participant are required to deposit additional funds in proportion to their net settlement amount with the defaulting participant) is likely to discourage participants from trading with a counterparty with a deteriorating financial condition, but the margin model imposes a higher margin for a decreasing position, which results in a secure margin policy. Clearing funds may be provided in yen cash or JGBs.

Participants with a shortfall in FOS and clearing funds are required to deliver the necessary amount of funds or collateral by 10:00 and 11:00 on the following business day, respectively. Clearing funds are also designed to cover the risk of failure by a participant to make the FOS payment, which includes variation margin. The JGBCC can also raise margin requirements when the financial condition of a participant deteriorates.

The JGBCC has arrangements for addressing liquidity risk in the event of a participant's default. The JGBCC obtains liquidity from: (i) cash portion of the clearing funds; (ii) funding from markets or participants with T+0 repos, using JGBs received from non-defaulting participants and JGBs pledged as clearing funds; and (iii) drawdown of committed lines of credit. Participants who are the original counterparties of the defaulting participant are obliged to conduct T+0 repo transactions with the JGBCC when it has a liquidity shortfall.

4.3.3.6 Links to other systems

Settlement of the net positions in the JGBCC takes place on a DVP basis over the BOJ-NET FTS and the BOJ-NET Book-entry System, using the current account and JGB account that the JGBCC holds with the Bank of Japan. The SPDC function provided through these systems plays a key role in realising DVP under RTGS.

The JGBCC also has a link to the PSMS operated by JASDEC to receive confirmation results for trades executed between clearing participants. The JGBCC does not have cross-margin arrangements across CCPs and does not maintain cross-border arrangements or clearing links with overseas securities settlement systems.

4.3.3.7 Pricing

The JGBCC charges participants with clearing fees based on the value of transactions cleared for each participant, which is subject to a maximum amount. Settlement fees are set at a fixed rate per DVP transaction. These fee rates vary depending on transaction type, including whether the transaction is an outright or a repo transaction. The JGBCC also charges fees for counterparty risk based on the net outstanding positions. Such fees are charged mainly for term repo transactions. There are also fixed fees for maintaining an account and terminals.

4.3.3.8 Major ongoing and future projects

The JGBCC currently clears approximately 40% of the JGB market (outright and repo transactions). Based on the experience of the financial crisis in 2008, it has been suggested that a wider range of market participants make use of the JGBCC in order to expand the risk reduction and efficiency benefits of CCP across the JGB market. Trust banks were identified as a segment with a low participation in the JGBCC despite their large market presence. In

December 2010, the JGBCC agreed with the Trust Companies Association of Japan that it would make necessary changes to its systems and processes to facilitate trust banks' participation. In turn, the association agreed that the trust banks would aim to participate in the JGBCC in the first half of fiscal 2014 for transactions associated with their asset administration services.

4.3.4 Osaka Securities Exchange (OSE)

4.3.4.1 Institutional framework

The OSE outsourced its clearing service for cash securities to the JSCC when the latter was established with the aim of integrating the internal clearing functions of securities exchanges across the country. However, the OSE still provides clearing services for exchange-traded derivatives listed on the OSE.

Founded in 1878, the OSE was converted from a membership organisation to a joint stock corporation in April 2001 with a view to improving its international competitiveness following an amendment of the *Securities and Exchange Act* that allowed stock exchanges to transform their corporate structure.

4.3.4.2 Participation

As of June 2011, there were 94 participants, mainly securities companies. There are two clearing membership qualifications: one for stock index futures and options trading and equity options trading, and the other for FX derivatives trading. There are also two types of clearing qualifications, that is, the principal clearing qualification entitling the member to settle its own transactions only, and the agency clearing qualification entitling the member to settle the transactions of non-clearing participants in addition to its own.

The OSE sets the criteria for obtaining and maintaining these qualifications. The OSE regularly monitors participants for their operational reliability and financial standing. If a participant is observed to have significant problems in relation to these issues and to hold excessive positions, the OSE has the right to suspend its assumption of the participant's obligations and revoke the participant's qualification (see Section 4.3.4.5).

Financial standards for the acquisition of qualifications are higher than those for their maintenance, and those for the agency clearing qualification are higher than those for the principal clearing qualification. For example, the financial standards for securities companies seeking to acquire the principal clearing qualification are: (i) no less than JPY 300 million in capital; (ii) no less than JPY 2 billion in net assets; and (iii) a capital-to-risk ratio of more than 200%.

4.3.4.3 Types of transaction

Eligible products for listed derivatives are: (i) stock index futures and options such as Nikkei 225 Futures; (ii) equity options; (iii) FX derivatives (margin contracts on rolling spot futures). FX derivatives included eight yen-denominated currency products and three non-yen-denominated currency products as of June 2011.

4.3.4.4 Operation of the system and settlement procedures

The OSE assumes participants' obligations at the time of trade execution. Participants are informed of netting results, and net cash settlements for option premiums, option execution results, marking to market of futures positions, and final settlement on expiration date are executed until 13:00 on the day following the trade/mark to market for payments to the OSE and just after 14:45 for payments to participants. Fund transfer instructions are sent to either settlement banks or the Bank of Japan. The OSE designates five commercial banks for cash settlement. Securities settlements for equity options are cleared at the JSCC, and equities are transferred at JASDEC (see Chart 1).

4.3.4.5 Risk management

The OSE manages credit risk vis-à-vis participants by setting participant qualifications, and through frequent intraday measurements of risk exposure and a loss allocation scheme.

The OSE monitors risk exposure on an almost hourly basis, estimating the potential loss for individual participants from their positions of stock index futures and options trading, equity options trading and FX derivatives trading. The risk exposure to a participant is calculated as the gap between the amount of margin posted by the participant and the maximum loss estimated according to its net positions in derivative products and a high confidence level of price fluctuation over a long-term period (eg the third standard deviation of the two-day price change ratio through a sample period of more than 25 years with regard to stock index futures and options). If the risk exposure exceeds a set level in comparison with the participant's net assets, the OSE confirms the details of its positions including those with clients, focusing on concentration risk for specific clients. If necessary, the OSE recommends that the participant improve its risk management and monitors progress. In the absence of improvements, the OSE examines the participant and can ultimately raise its margin requirement or haircut on collateral and order that its positions be reduced in a stepwise manner.

The loss allocation scheme at the OSE comprises: (i) the defaulter's "clearing margin"; (ii) the defaulter's "clearing deposit" as default fund; (iii) the default compensation reserve fund owned by the OSE; (iv-a) accumulated OSE income; (iv-b) remaining "clearing deposits" of non-defaulters; and (v) loss-sharing among non-defaulters. The financial resources described in (iv-a) and (iv-b) are paid out concurrently in the same amounts to cover losses beyond the sum of (i), (ii) and (iii).

The OSE uses SPAN to calculate the amount of clearing margin. Margin must be posted by 12:00 on the day following the margin requirement. Emergency margin calls are triggered by large price fluctuations and require participants to post their margin by 16:00 on the same day.

The OSE prepares for liquidity risk in the event of a participant's default by having liquidity on hand, overdraft arrangements and committed lines of credit from commercial banks.

4.3.4.6 Links to other systems

The OSE has links to the BOJ-NET FTS for funds transfers, the JSCC to clear cash securities, and the JASDEC Book-entry System to ensure DVP settlement. The OSE does not have cross-margin arrangements across CCPs, nor does it have cross-border arrangements or clearing links with overseas settlement systems.

4.3.4.7 Pricing

The OSE adjusts its clearing fees based on values of transactions cleared measured by units of derivative trading. These fee rates differ (i) among derivative products; and (ii) among clearing for final settlement on expiration date, clearing for options execution and other types of clearing. Transaction fees are also charged in proportion to transaction values. The OSE has introduced discount systems for transaction fee rates based on average transaction value over the last three months.

4.3.4.8 Major ongoing and future projects

The OSE launched the new J-GATE derivatives trading system in February 2011 with a globally competitive high latency, a co-location service and globally accepted trading rules. The OSE has extended night session trading hours to 03:00 on the following day, and trading value during the session is increasing. The OSE abolished the 11:00 to 12:30 lunch break for stock index futures and options trading and equity options trading in February 2011. Since then, trading volume during that period has occasionally accounted for 20–30% of a day's

trading volume. FX derivatives were launched in July 2009, and trading volume has increased due to a rising number of participants and market-maker enhancements. The OSE is examining the possibility of extending night session trading hours and introducing new derivative products such as volatility index derivatives and foreign stock index derivatives.

4.3.5 Tokyo Financial Exchange (TFX)

4.3.5.1 Institutional framework

TFX provides in-house clearing services for exchange-traded derivatives listed on TFX.

In April 1989, the Tokyo International Financial Futures Exchange (TIFFE) – the predecessor of the TFX – was established under the *Financial Futures Trading Act* as a membership organisation with capital provided by large domestic and foreign financial institutions. It started trading and clearing services for euroyen/eurodollar futures and yen/dollar currency futures, expanding its range of derivative products and maturities in line with the increasing number of derivatives markets. The TIFFE was demutualised in April 2004 and was renamed as the Tokyo Financial Exchange in September 2007. This reflected a decision to broaden its business from derivatives to various other financial products when the *Financial Futures Trading Act* was abolished and incorporated into the *Financial Instruments and Exchange Act* as an amendment of the *Securities and Exchange Act*.

While demand for short-term interest rate derivatives remains subdued in markets with near-zero rates and low volatility, FX derivatives introduced in 2005 are growing rapidly as one of the TFX's core businesses.

4.3.5.2 Participation

There were 46 clearing members for the major derivative products of interest rate futures as of August 2011. Most of the members are banks and securities companies including foreign financial institutions. Three participants have a trade membership but no clearing membership, relying on other members to clear their trades. One of these uses remote trading from an overseas location. There were 28 clearing members for FX derivatives and 10 clearing members for equity index derivatives as of August 2011, mainly comprising retail-oriented securities companies for both products. Capital participation is not required for membership, and most current equity holders are original members from the membership organisation phase.

The TFX sets criteria for the acquisition of qualifications. The TFX regularly monitors participants for their operational reliability and financial standing. If a participant is observed to have significant problems in relation to these issues, the TFX has the right to suspend its assumption of the participant's obligations and revoke the participant's qualification.

Financial requirements for qualifications differ according to the scale of the participant's net assets. The smaller the participant, the more stringent and numerous the requirements imposed for membership; for example, the size of the participant's parent company, company guarantees, and experience as a clearing member in other derivatives exchanges. There are common requirements such as that the net asset value to book value ratio has to be above one and stable earnings are expected. To qualify for FX derivatives, a minimum annual trade volume is required and financial conditions must also be met.

4.3.5.3 Types of transaction

Clearing products for listed derivatives are: (i) three-month euroyen futures; (ii) options on three-month euroyen futures; (iii) overnight call rate futures; (iv) spot-next GC repo rate futures; (v) FX derivatives (margin contracts of rolling spot futures); and (vi) equity index derivatives (margin contracts on rolling spot futures). FX derivatives included 15 yen-denominated currency products and 11 non-yen-denominated currency products as of August 2011. Equity index derivatives include four indices: the Nikkei 225, the DAX, the

FTSE 100 and the FTSE China 25. The TFX also clears trades in three-month euroyen futures listed on NYSE Liffe.

4.3.5.4 Operation of the system and settlement procedures

The TFX assumes participants' obligations at the time of trade execution. For interest rate derivatives, participants are informed of netting results on the evening of trade date, and net cash settlements for option premiums, option execution results, marking to market of futures and option positions, and closing on expiration date are executed by 11:00 on the next day for payments to the TFX accounts at settlement banks. The settlement banks receive and pay out the net amount to TFX's account with the Bank of Japan by 12:00. Payments from the TFX to settlement banks and participants are executed by 12:00 and 14:00, respectively. TFX accounts in all settlement banks are square once all procedures are complete.

With regard to FX derivatives and equity index derivatives, net cash settlements use the client's margin account for all payments of realised and unrealised profit/loss via mark to market and position closing, as well as margin in proportion to the notional amount. Net settlements are executed in the service offices of settlement banks designated by the TFX. Net settlement operates on a T+2 settlement cycle. Payments between clearing members and the TFX are executed by 10:00 on the second day after trades are executed (see Chart 1).

4.3.5.5 Risk management

The TFX manages its exposure to the credit risk posed by participants by setting participation criteria, monitoring participants and maintaining a loss allocation scheme.

The loss allocation scheme for clearing interest rate derivatives comprises the following elements: (i) the defaulters' margin; (ii) the defaulters' clearing fund; (iii) the TFX's default compensation reserve fund; (iv) the remaining clearing funds of non-defaulters; and (v) loss-sharing among non-defaulters. The TFX uses SPAN to calculate the margin amount, which must be posted by 11:00 on the day following the margin requirement. Emergency margin calls are triggered by large price developments. In such cases, participants are required to post their margin by 15:30 on the same day. The required balance of the clearing fund is calculated on the basis of each participant's risk exposure and is subject to a floor of JPY 50 million per participant.

The loss allocation scheme for clearing FX derivatives and equity index derivatives comprises: (i) the defaulter's margin; (ii) the defaulter's clearing fund; (iii) the TFX's default compensation reserve fund; (iv) the remaining clearing funds of non-defaulters; and (v) loss-sharing among non-defaulters. The margin accounts for these contracts include both variation margin for marking to market and initial margin for potential losses arising from the current position. The initial margin required depends on position volume, the price level and price volatility as updated by the TFX.

The TFX manages its exposure to liquidity risk in the event of a participant default through liquidity on hand and overdraft arrangements with commercial banks. For FX derivatives and equity index derivatives, all of the deposits in margin accounts are held as cash to cover emergency liquidity needs in the event of default or a surge in withdrawals by clients and participants with net positive positions.

4.3.5.6 Links to other systems

The TFX has links to the BOJ-NET FTS and the JGB Book-entry System for collateral management. The TFX does not have cross-margin arrangements across CCPs, but provides a clearing service for three-month euroyen futures listed on NYSE Liffe.

4.3.5.7 Pricing

The TFX charges trading fees including clearing service fees based on trading volume measured by units of derivative trades. Fee rates are fixed among derivative products. The TFX also charges a registration fee for obtaining membership and minimum monthly fees for holding membership.

4.3.5.8 Major ongoing and future projects

The TFX plans to introduce new products such as LIBOR futures and equity index derivatives on the FTSE TWSE Taiwan 50. The TFX is also targeting an expansion in foreign members with remote access for interest rate derivatives trading and an increase in domestic and foreign client participation in FX and equity index derivatives trading.

4.4 Securities settlement systems

4.4.1 JGB Book-entry System and BOJ-NET JGB Services

The JGB Book-entry System is an arrangement for processing transfers of JGBs by crediting and debiting accounts on the books of participating institutions. Online processing services for the JGB Book-entry System are provided through BOJ-NET JGB Services. JGB settlements are processed on a DVP basis by linking BOJ-NET JGB Services to the BOJ-NET FTS (see Chart 1). The daily volume and value of transactions settled through BOJ-NET JGB Services averaged 16,000 transactions and JPY 76 trillion (USD 870 billion²³) in 2010.

4.4.1.1 Institutional framework

The JGB Book-entry System is operated by the Bank of Japan as the book-entry transfer institution under the *Book-entry Transfer Act* (see Section 1.1.1.5). BOJ-NET JGB Services, a computer network system, is owned and operated by the Bank of Japan. The Policy Board of the Bank of Japan functions as the ultimate decision-making body for operation of the JGB Book-entry System and BOJ-NET JGB Services.

The legal basis for the Bank of Japan's operation of the JGB Book-entry System is derived from (i) its designation as the book-entry transfer institution by the competent ministers (the commissioner of the FSA to whom the Prime Minister has delegated authority, the Minister of Justice, and the Minister of Finance) under Article 47 of the *Book-entry Transfer Act*, and (ii) authorisation of this operation by the Commissioner of the FSA (to whom the Prime Minister has delegated authority) and the Minister of Finance as an integral part of the Bank of Japan's business, contributing to the smooth settlement of funds as prescribed in Article 39 of the *Bank of Japan Act*. Transfers of JGBs under the JGB Book-entry System are governed by the *Book-entry Transfer Act* and other relevant laws, as well as by rules and procedures established by the Bank of Japan pursuant to these laws.

Pursuant to Article 47 of the *Book-entry Transfer Act*, the Bank of Japan is subject to regulations on book-entry transfer institutions. Unlike other book-entry transfer institutions (stock corporations), however, the Bank of Japan is exempted from regulations regarding the prohibition of other business, the dismissal or disqualification of executives, on-site inspections, and financial reporting and improvement orders, as a special exception permitted by Article 48 of the *Book-entry Transfer Act*.

²³ Converted at yearly average JPY/USD exchange rates for 2010.

4.4.1.2 Participation

The JGB Book-entry System has three types of participants: direct participants, indirect participants and foreign indirect participants (FIP). An FIP is an entity which maintains its account with a direct participant, indirect participant, or FIP as their customer, and which can itself establish an account for its customer outside Japan. Access criteria for the JGB Book-entry System are disclosed to the public and require applicants to be in sound financial condition and have appropriate operational capability. Financial condition is assessed on capital adequacy ratios, and specific criteria are set according to the type of institution. As of June 2011, the JGB Book-entry System had 298 direct participants, 1,015 indirect participants and 128 FIPs.

4.4.1.3 Types of transaction

Only JGBs are processed in the JGB Book-entry System, and payments are made only in yen.

4.4.1.4 Operation of the system

BOJ-NET JGB Services processes final settlements of JGB transfers continuously throughout the day on an RTGS basis, both on a DVP and a free of payment (FOP) basis. The BOJ-NET provides DVP services by linking the BOJ-NET FTS with BOJ-NET JGB Services. The input hours for online instructions and the processing hours for BOJ-NET JGB Services are 09:00–16:30.

The Bank of Japan provides a liquidity-saving facility for DVP settlement, ie simultaneous processing of DVP and collateralisation (SPDC). By using this facility, a financial institution buying JGBs can post the JGBs receiving from the seller as collateral for an intraday overdraft from the Bank of Japan and simultaneously use the funds drawn to pay the seller. JGBs can be posted and returned any time during the operating hours of BOJ-NET JGB Services.

The timing of final settlements of JGB transfers on an RTGS basis through the BOJ-NET is clearly defined by rules set by the Bank of Japan as follows. A transfer of JGBs becomes final when the receiver's JGB account is credited on its transfer account book. The transfer of the corresponding funds becomes final when the current account of the receiver (ie a cash settlement agent) held at the Bank of Japan is credited.

4.4.1.5 Risk management

Debit positions in securities accounts are avoided under the JGB Book-entry System because JGB transfers are made only when the balance in the deliverer's JGB account is sufficient. BOJ-NET JGB Services does not accept transfer instructions that would create debit positions in JGB accounts.

4.4.1.6 Links

The JGB Book-entry System and BOJ-NET JGB Services maintain no direct linkages with overseas FMIs.

4.4.1.7 Pricing

The Bank of Japan covers the costs of developing and maintaining the system infrastructure at its own expense because it operates the JGB Book-entry System and BOJ-NET JGB Services as businesses contributing to the achievement of its objectives under the *Bank of Japan Act*, ie to ensure smooth settlement of funds among banks and other financial institutions (see Section 1.1.1.3). On the other hand, the Bank of Japan charges users of the BOJ-NET JGB Services fees for "online instructions" made through the services under the "beneficiary pays" principle, and recovers the costs of external linkages (such as the costs of

hardware and software necessary for external linkages and the cost of using the online network.

4.4.1.8 Major ongoing and future projects

See Section 3.2.1.7.

4.4.2 Japan Securities Depository Center (JASDEC)

4.4.2.1 Institutional framework

JASDEC started its operation as a securities settlement system with the function of central securities depository in 1991. JASDEC, previously established as a foundation, converted its corporate structure to a stock corporation in January 2002. JASDEC operates the following businesses: (i) book-entry transfer for stocks, commercial papers, corporate bonds, investment trust and other securities excluding Japanese government bonds for which the Bank of Japan provides the settlement system; (ii) a DVP settlement service for those securities; (iii) a pre-settlement matching service; and (iv) custody and settlement services for foreign securities.

JASDEC's largest shareholder is the Tokyo Stock Exchange Group and the second largest is the Japan Securities Dealers Association. Other major shareholders include banks and security companies. Separately from the board of directors and the board of auditors, JASDEC has a business operational committee with 10 subcommittees that represent user needs. Comprising major users, the business operational committee discusses operational matters in line with guidance from JASDEC's board. JASDEC also has an advisory committee comprising external experts.

In 2003, JASDEC established the JASDEC DVP Clearing Corporation (JDCC), a subsidiary for the clearing of customer-side transactions, that is, transactions between securities dealers and institutional investors (see Section 4.3.2).

4.4.2.2 Participation

JASDEC categorises participants of the book-entry transfer business into four groups: (i) issuing companies; (ii) JASDEC participants (securities firms and banks in account with JASDEC); (iii) indirect account management institution (domestic and foreign financial institutions who maintain accounts with a direct account management institutions for holding securities on behalf of their customers); (iv) fund settlement corporations; and (v) others. JASDEC has set up qualification requirements for each category.

As of October 2011, JASDEC had 220 participants in the book-entry transfer system for stocks, and 95 indirect account management institutions (AMIs) including foreign AMIs. The book-entry transfer system for investment trusts has 184 JASDEC participants, 699 indirect AMIs and 83 issuers. The system for corporate bonds has 88 JASDEC participants, 435 indirect AMIs and 2,540 issuers. The book-entry transfer system for commercial paper has 68 JASDEC participants, 39 indirect AMIs and 494 issuers.

4.4.2.3 Types of transaction

JASDEC operates four book-entry transfer systems and a pre-settlement matching system, as well as providing custody and settlement services for foreign securities. The book-entry transfer system for stocks covers bonds with share options, share options, REITs, ETFs and stocks. The book-entry transfer system for corporate bonds also covers municipal bonds and government agency bonds. There are also book-entry transfer systems for commercial paper and investment trusts.

4.4.2.4 Operation of the system

The securities served by JASDEC have been dematerialised and can be settled by DVP through the BOJ-NET or through other cash settlement banks. See below for the operations of the respective systems (see Chart 1).

Book-entry transfer system for CP and corporate bonds

Settlement in the book-entry transfer system for commercial paper and corporate bonds uses DVP1, whereby both delivery of securities at JASDEC and payments of funds at the BOJ-NET FTS are made on a gross real-time basis. To achieve DVP1 for commercial paper and corporate bonds, JASDEC established an operational link between its book-entry system for commercial paper and corporate bonds and the BOJ-NET FTS. Once trade details entered by the buyer and seller are matched in JASDEC's pre-settlement matching system, JASDEC automatically generates settlement instructions. On settlement day, JASDEC transfers the securities from the deliverer's account to the book-entry transfer account, temporarily locking its settlement amount, and sends the request for payment to the BOJ-NET FTS. On receiving JASDEC's request for payment, the BOJ-NET FTS notifies it to the securities receiver (or its settlement bank). After receiving the payment instruction from the securities receiver, the BOJ-NET FTS processes payments of funds from the securities receiver to the securities deliverer. Then the BOJ-NET FTS notifies completion of payments to JASDEC, which releases the previously locked securities and transfers them to the account of the securities receivers. The settlement for commercial paper and corporate bonds takes place from 09:00 to 17:00 (the cut-off time for entering trade details for same-day DVP settlement is 16:20).

Book-entry transfer system for stocks

Two types of DVP model are used for settlement of secondary market stock transactions. Stock transactions executed at stock exchanges (ie transactions between securities firms) must be settled on a DVP3 basis, where both securities and corresponding cash are settled on a net-net basis. On the trade date, transactions are matched by stock exchanges and cleared by JSCC. On settlement day, the resulting net positions in securities are settled at JASDEC, while net positions in cash are settled at the designated cash settlement banks, which comprise a panel of commercial banks and the Bank of Japan (see Section 4.3.1).

Stock transactions in the OTC market (ie transactions between securities firms and institutional investors) can be settled by gross-net DVP (DVP2). Once the trade is executed, the transaction data are matched by JASDEC's pre-settlement matching system and submitted to the JDCC. On the settlement day, the participants' securities positions are settled on a gross basis at JASDEC, while the resulting net cash positions are settled at the BOJ-NET FTS (see Section 4.3.2). For transactions settled on a FOP basis, the participants can send transfer instructions from 09:00 to 15:30 for immediate settlement.

Book-entry transfer system for investment trust

Most transactions settled in the book-entry transfer system for investment trusts are made on a purchase and cancellation basis rather than representing transfers associated with trades between investors. DVP1 can be used for the purchase and cancellation of investment trusts between issuers' trustee banks and fund distributors. To achieve DVP1, a linkage was established between the JASDEC book-entry system for investment trusts and the BOJ-NET FTS. When a funds distributor receives a purchase order from the investor, it passes the order to the issuer. On receiving the order from the funds distributor, the issuer sends JASDEC a request for the order to be recorded. On settlement day, JASDEC records registers the newly created balance on the issuance account, which temporarily records the details of the request from the issuer, and sends the request for payment to the BOJ-NET FTS. The BOJ-NET FTS then notifies the settlement bank of the funds distributor. After receiving the payment instruction from the settlement bank, the BOJ-NET FTS transfers the

payment from the funds distributor to the issuer's trustee bank, and notifies JASDEC of the completed settlement. Upon confirmation from the BOJ-NET FTS, JASDEC records the purchased balances, which are temporarily recorded in the issuance account, on the funds distributor's account. The settlement for investment trusts takes place from 09:00 to 17:00 (the cut-off time for submitting same-day DVP requests for purchase/cancellation to JASDEC is 16:00).

Custody and settlement system for foreign securities

JASDEC provides custody and settlement services for foreign securities listed on stock exchanges in Japan. JASDEC directly or indirectly through local custodians opens accounts with foreign CSDs, holds foreign securities in those accounts on behalf of its participants, and provides custody and settlement services on its own books.

4.4.2.5 Risk management

JASDEC's risk management committee, which is chaired by its president, takes measures to strengthen overall risk management, and regularly monitors internal control systems for various risks including operational risk.

The settlement risk of market participants is mitigated through the use of the DVP mechanism. As the central clearing of stocks is provided by the JSCC and the JDCC, JASDEC is not exposed to counterparty risk from their participants.

4.4.2.6 Links to other systems

To achieve DVP settlement, JASDEC links with the BOJ-NET FTS. JASDEC also directly or indirectly links with foreign CSDs to provide custody and settlement services for foreign stocks.

4.4.2.7 Pricing

JASDEC charges an initial entry fee and a maintenance fee. The fee scale is based on the categorisation of participants (see Section 4.4.2.2) and the volume of transfers processed. The initial entry fee includes the preparation fee for system connection. The maintenance fee is charged only to JASDEC participants and consists of fixed fees such as the fee for system connection, and variable fees such as a transfer fee.

4.4.2.8 Major ongoing and future projects

JASDEC plans to replace its main operating system in 2014. Together with this system replacement, JASDEC and the JDCC plan to start DVP settlement services for stock lending transactions. In the international arena, JASDEC participates in the regional and global CSD forums, and has signed memoranda of understanding with foreign CSDs for the purpose of information-sharing.

4.5 The use of securities infrastructures by the central bank

As well as operating the BOJ-NET JGB Book-entry System, the Bank of Japan uses BOJ-NET JGB Services and JASDEC to carry out central banking activities. The Bank of Japan opens securities accounts with BOJ-NET JGB Services and JASDEC, and uses those systems to manage collateral securities for its various policy operations. The Bank of Japan also provides the intraday liquidity necessary for ensuring smooth settlement in the BOJ-NET Funds Transfer System under its RTGS system, using collateral securities consisting of JGB, commercial paper, corporate bonds and other instruments that meet the Bank of Japan's eligibility criteria. In addition, the Bank of Japan, as a part of its JGB management services, provides the government with issuance services as well as interest/redemption payment services for JGBs. BOJ-NET JGB Services is used for JGB issuance auctions as well as the recording of JGB issuance and redemption.

**Payment, clearing and
settlement systems in
the Netherlands**

Contents

List of abbreviations	317
Introduction.....	319
1. Institutional aspects	319
1.1 The general institutional framework	319
1.1.1 Institutions responsible for regulating, supervising and overseeing the financial infrastructure	319
1.1.2 The legal framework	320
1.2 The role of the Netherlands Bank (DNB).....	321
1.2.1 The operational role.....	322
1.2.2 DNB as catalyst.....	323
1.2.3 DNB as overseer	323
1.2.4 Cooperation with other institutions.....	325
1.3 The role of other private and public sector institutions	325
1.3.1 Institutions in the payment sector	326
1.3.2 Institutions in the securities sector	327
2. Payment media used by non-banks.....	328
2.1 Cash payments.....	328
2.2 Non-cash payments.....	328
2.2.1 Non-cash payment instruments	328
2.2.2 Non-cash payment terminals	331
2.2.3 Interchange fee regulation	331
3. Payment systems	332
3.1 General overview.....	332
3.2 The real-time gross settlement system: TARGET2-NL	332
3.2.1 Institutional framework.....	332
3.2.2 Participation.....	332
3.2.3 Types of transaction	332
3.2.4 Operation of the system and settlement procedures.....	333
3.2.5 Risk management.....	333
3.2.6 Pricing	333
3.2.7 Major ongoing and future projects	333
3.3 Retail payment systems.....	333
3.3.1 Equens	333
3.3.2 CCV.....	335
4. Systems for post-trade processing, clearing and securities settlement	336

4.1	General overview	336
4.2	Central counterparties and clearing systems	337
4.2.1	LCH.Clearnet SA	337
4.2.2	European Multilateral Clearing Facility (EMCF)	338
4.2.3	Holland Clearing House	340
4.3	Securities settlement system	340
4.4	DNB's involvement	343
	Liquidity provider.....	343
	Settlement bank.....	343
	Facilitator of the guarantee model.....	343

List of abbreviations

AFM	The Netherlands Authority for the Financial Markets – Autoriteit Financiële Markten
BeNeMAC	Joint Belgian/Dutch Market Advisory Committee
BSP	Biller service provider
CCP	Central counterparty
CESR	Committee of European Securities Regulators
CSD	Central securities depository
CSS	Clearing and settlement system
DACSI	Dutch Advisory Committee Securities Industry
DNB	Netherlands Bank – De Nederlandsche Bank
DSI	The Dutch Securities Institute
EACHA	European Automated Clearing House Association
EBA	Euro Banking Association
EMCF	The European Multilateral Clearing Facility
ENIEC	The Euroclear Interprofessional Securities Centre
ESCB	European System of Central Banks
ESES	Euroclear Settlement Securities platform
ESMA	European Securities and Markets Authority
HAM	Home Accounting Module
ICSD	International Central Securities Depository
IOSCO	International Organization of Securities Commissions
LCH.Clearnet	An organisation for the clearing of securities and derivatives transactions
MAC	Market advisory committees
MIF	Multilateral interchange fee
MiFID	European Markets in Financial Instruments Directive
MTF	Multilateral Trading Facility
NCB	National Central Bank
NFC	Near-field communication
NVB	The Dutch Banking Association – Nederlandse Vereniging van Banken
NVIEG	Dutch Association of Electronic Money Institutions
OTC	Over the counter
PSD	Payment Service Directive
SDN	A standard for sending bills electronically – Standaard Digitale Nota
SEPA	Single Euro Payments Area
TARGET2-NL	The Dutch component of the ESCB's TARGET2 RTGS system

Netherlands

TFEU	Treaty on the Functioning of the European Union
TOM MTF	A multilateral trading facility located in Amsterdam
UTP	Universal trading platform
VEB	The Association of Stockholders
WFT	Financial Supervision Act – Wet Financieel Toezicht

Introduction

Like others around the world, the Dutch payment system has been influenced by technological innovation and evolving payment methods. The use of debit cards continues to increase for point of sale payments. In 2010, more than 2 billion debit card purchases were made at points of sale, representing about 28.5% of all domestic point of sale payments. Cash continues to be the most frequent used form of payment at point of sale with 68.5% of domestic point of sale payments. For remote payments, the most frequently used instruments are electronic credit transfers and direct debits. In recent years, online shopping has become more and more important. iDEAL is the most used payment method for online purchases, accounting in 2010 for nearly 69 million transactions.

Retail payment services are provided by most commercial banks. Collectively, the banks process around 5 billion cashless retail payments a year. The Dutch payment services market is quite concentrated, as is the entire banking market. The bulk of private customer accounts are held with just a few banks. In addition to the deposit-taking institutions that offer a wide range of payment services, a few international credit card companies offer credit card services.

Many retail payments are processed centrally by the automated clearing house Equens, in which nearly all banks participate. Another low-value payment system, licensed to process Dutch debit card transactions since 2007, is CCV, which has smaller processing volumes than Equens.

Large-value payments are processed via TARGET2, the RTGS system. TARGET2 is the ESCB's payment system for interbank payments in euros.

At present, the Amsterdam securities exchange is a subsidiary of NYSE Euronext. Transactions in both securities and derivatives executed on Euronext Amsterdam are cleared by LCH.Clearnet SA. LCH.Clearnet is a Paris-based company with a local branch in Amsterdam. There is also a central counterparty based in the Netherlands: the European Multilateral Clearing Facility (EMCF). EMCF is the central counterparty for some exchanges located in northern Europe and for the largest European multilateral trading facilities (MTFs). All trades in Dutch securities are settled on the Euroclear Group's Euroclear Settlement of Euronext-zone Securities platform.

However, the Dutch securities landscape is in state of change. In May 2010, NYSE Euronext cancelled its clearing contract with LCH.Clearnet. Due to the period of notice, this would have resulted in its services being discontinued at the end of 2012. But since the process of establishing or selecting a new central counterparty (CCP) was thwarted by the intended merger between NYSE Euronext and Deutsche Börse (which did not go through), the contract between NYSE Euronext and LCH.Clearnet has been extended until 2013. No final decision has been made on the situation thereafter.

1. Institutional aspects

1.1 The general institutional framework

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

The institutions responsible for the regulation, supervision and oversight of the payment, clearing and settlement infrastructure are the Netherlands Authority for the Financial Markets

(AFM), tasked with supervising the operations of the financial markets,¹ and the Netherlands Bank (DNB), the central bank of the Netherlands, which exercises prudential supervision over the financial sector.² In addition, the Minister of Finance also has some regulatory and supervisory powers in this field.

DNB exercises oversight of institutions and systems that offer clearing and settlement services in the field of payments and securities. DNB has a double mandate in this respect, based both on national law and on EU Treaties. Under the Bank Act 1998, one of DNB's basic tasks within the national context is to "to promote the smooth operation of payment systems".³ However, DNB is also an integrated part of the European System of Central Banks (ESCB), whose tasks are laid down in the Treaty on the Functioning of the European Union (TFEU) and the Statute of the ESCB, which is an integral part of the EU Treaties. The promotion of the smooth operation of payment systems is one of these tasks.⁴ The Statute of the ESCB furthermore provides a specific legal basis in Article 22, according to which "the ECB and the national central banks may provide facilities, and the ECB may make regulations, to ensure efficient and sound clearing and payment systems within the Union and with other countries".

On the basis of the Dutch Financial Supervision Act, the AFM and DNB jointly supervise the clearing and settlement of securities transactions on regulated markets and multilateral trade facilities in the Netherlands.⁵ Also, the AFM has been designated by the Minister of Finance as the supervisor of the CSD regulated under the Dutch Securities Giro Transfer Act (*Wet giraal effectenverkeer*),⁶ while the Minister of Finance retains some supervisory powers under this Act.

1.1.2 The legal framework

The Netherlands is an EU member state and part of the euro area. As a consequence, EU legislation applies in the Netherlands, either without any further legislative action of the national legislator being required (as is the case for EU regulations, eg Regulation (EC) no 924/2009 on cross-border payments in the Community; Regulation (EC) no 1781/2006 on information on the payer accompanying transfers of funds), or through national law implementing the EU standards (notably in the case of EU directives). See also the descriptive Red Book chapter on the euro area for an overview of relevant EU law applicable in the Netherlands. This paragraph contains only an overview of the most relevant national law and regulatory frameworks covering the payment, clearing and settlement infrastructure in the Netherlands, starting with an overview of national law implementing relevant EU directives.

National law implementing relevant EU directives:

- Directive 98/26/EC on Settlement Finality in Payment and Securities Settlement Systems ("Finality Directive"): this directive has been implemented in the Dutch Financial Supervision Act and the Dutch Bankruptcy Act (Title 1.11a);

¹ Section 1:25 of the Dutch Financial Supervision Act (*Wet op het financieel toezicht*).

² Section 1:24 of the Dutch Financial Supervision Act.

³ Article 4(2) Dutch Bank Act 1998 (*Bankwet 1998*).

⁴ Article 127(2) TFEU, Article 3(1), fourth indent, Statute of the ESCB; which is also reflected in Article 3(1) under (e) of the Dutch Banking Act 1998.

⁵ Article 5:26 in conjunction with Article 5:30(e) Dutch Financial Supervision Act (transactions on regulated markets) and 4:91a Dutch Financial Supervision Act (transactions on multilateral trade facilities) respectively.

⁶ Ministerial decree 9 July 2002 (*Stcrt*, 2002, 134).

- Directive 2001/24/EC on the reorganisation and winding-up of credit institutions (“Winding-up Directive”): this directive has been implemented in the Dutch Bankruptcy Act (Title 1.11aa);
- Directive 2002/47/EC on financial collateral arrangements (“Collateral Directive”): this directive has been implemented in the Dutch Civil Code (Title 7.2);
- Directive 2004/39/EC on markets in financial instruments (“MiFID”): this directive has been implemented in the Dutch Financial Supervision Act and several ministerial orders pursuant to this act;
- Directive 2005/60/EC on the prevention of the use of the financial system for the purpose of money laundering and terrorist financing and Directive 2006/70/EC laying down implementation measures: these directives have been implemented in the Dutch Act on the prevention of money laundering and terrorism financing;
- Directive 2007/64/EC on payment services in the internal market (“Payment Services Directive”): this directive has been enacted in the Dutch Financial Supervision Act and the Dutch Civil Code;
- Directive 2009/110/EC on the taking up, pursuit and prudential supervision of the business of electronic money institutions (“E-money Directive”): this directive is currently in the process of implementation.

Other national legislation relevant for the payment, clearing and settlement infrastructure in the Netherlands includes – besides general principles of private law contained in the Dutch Civil Code – the External Financial Relations Act 1994, which contains provisions relating to external payments, such as the obligation to report certain transactions for balance of payments purposes. Of particular importance for the securities post-trading infrastructure is the Dutch Securities Giro Transfer Act, which provides for the establishment of an institute responsible for the safekeeping, administration and general control of the book-entry securities transfer system. In accord with this Act, the institute for the book-entry transfer of securities is listed officially at the Chamber of Commerce as the Nederlands Centraal Instituut voor Giraal Effectenverkeer BV (Necigef). More generally known under its trade name of Euroclear Nederland, this facility holds collective deposits in which the owners of securities are entitled to their proportionate share. Euroclear Nederland determines which securities may enter its book-entry transfer system. Most securities listed on the Euronext Amsterdam stock market are book-entry securities held in custody by Euroclear Nederland. Under the Act, dematerialised securities may also be included in the book-entry system. The post-trade infrastructure of securities traded on regulated markets and multilateral trade facilities in the Netherlands is also subject to the oversight framework jointly established by the AFM and DNB, which imposes minimum standards on clearing and settlement systems.

Several legislative initiatives at the EU level will also have a major impact on the regulatory landscape regarding the clearing and settlement infrastructure in the Netherlands, including a proposed regulation on OTC derivatives, central counterparties and trade repositories; an awaited proposal for EU legislation on central securities depositories; and an awaited proposal for EU legislation on legal certainty of securities holding and disposition. For further details of these initiatives, see the descriptive Red Book chapter on the euro area. Planned legislation relating to the supervision of post-trade services and infrastructure at the national level was put on hold awaiting the outcome of these EU initiatives.

1.2 The role of the Netherlands Bank (DNB)

DNB is a private limited company whose shares are held by the Dutch State. The Bank Act, amended in 1998 to accommodate the Maastricht Treaty, ensures that DNB is independent from the government. The Bank Act 1998 and the Statute of the ESCB stipulate the tasks of DNB in respect of payments.

Pursuant to the Bank Act 1998 and the 2007 Financial Supervision Act, DNB is responsible for the supervision of banks, payment institutions and electronic money institutions. Banks, payment institutions and electronic money institutions must obtain authorisation from DNB and be entered in its register. They can also obtain a license in another EU country in order to operate in the Netherlands.

The Bank Act 1998 states that DNB must strive for the smooth operation of payment systems. It has a dual role with regard to payment systems: on the one hand, it provides payment services to banks and, on the other hand, it is responsible for the oversight of payment and securities settlement systems. For these purposes, DNB holds regular consultations with banks and other parties involved in the functioning of these systems.

1.2.1 The operational role

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

Services in respect of cash payments

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

- developing and ensuring the production of euro banknotes within the framework of the ESCB;
- distributing banknotes;
- verifying and inspecting banknotes both before and after circulation; and
- operating a national analysis centre for counterfeited banknotes.

The role of DNB in banknote circulation has changed in recent years. The involvement of commercial banks in this activity has increased, and the number of banknotes returned to DNB has declined. Banknotes are distributed through DNB's head office in Amsterdam. The commercial banks obtain from DNB the banknotes they need to supply their customers with cash. Most banknotes are distributed via ATMs, of which there are around 8,000 in the Netherlands. Excess banknotes flow back to the banks, which usually process them in cash centres. The banks check the banknotes for authenticity and soiling in accordance with the ECB Decision no ECB/2010/14 on the authenticity and fitness checking and recirculation of euro banknotes. This process is monitored by DNB. The unfit notes and a share of the fit notes are transferred to DNB, while the remaining fit notes are put back into circulation.

In the Netherlands, other cash handlers besides banks, such as retailers and casinos, are also involved in the recirculation of banknotes through ATMs. They fill ATMs with banknotes received at the cash register. The ECB Decision applies not only to banks but also to other parties that operate ATMs.

While DNB is responsible for banknote issuance, the Ministry of Finance is responsible for minting and issuing coins under the Coinage Act. DNB gives advice on the number of coins to be minted annually. Under a Royal Decree, DNB is responsible for the distribution of coins.

Services in respect of non-cash payments

DNB performs an operational role in the processing of non-cash interbank payments through TARGET2-NL. TARGET2 is the payment system operated by the ESCB for interbank

payments in euro. TARGET2 was introduced in the Netherlands on 18 February 2008. The difference vis-à-vis the previous version of TARGET is that it uses one central technical platform for payments, eliminating the need to maintain national large-value payment systems. Financial institutions send their large-value payments directly to the platform. Most Dutch credit institutions participate in TARGET2-NL.

Services in respect of securities transactions

DNB used to play a major operational role in the settlement of high-value securities transactions. For securities transactions not performed on the stock exchange, it provided delivery versus payment (DVP) services for banks. But after the launch of the Euroclear Settlement Securities (ESES) platform, DNB outsourced the processing of the cash settlement of all security transactions, both on-exchange and off-exchange, to ESES. For this reason, the operational role of DNB in effecting settlements on the ESES platform was reduced to opening, managing and monitoring the ESES cash accounts for participants. However, the cash settlement still takes place in central bank money. Furthermore, DNB allows clearing participants to meet their margin and clearing fund obligations to the CCP using their collateral account with DNB. This is the so-called guarantee model.

1.2.2 DNB as catalyst

In its role as catalyst, DNB encourages dialogue between stakeholders and conducts research on payment behaviour and payment costs with a view to increasing the payment system's efficiency. In 2002, the National Forum on the Payment System (Maatschappelijk Overleg Betalingsverkeer) was set up, representing both providers and users of the payments system. Hosted and chaired by DNB, the Forum holds regular consultations on the implications of developments in payment systems such as the creation of the Single Euro Payments Area (SEPA). Together with DNB and Currence (Currence is the owner of the uniform Dutch payment products PIN, Chipknip, Acceptgiro, iDEAL and Incasso/Machtigen), the Dutch banks have set up a SEPA Steering Group to prepare for the introduction of European payment products in the Netherlands. This will involve close consultation with payment service providers and users in the National Forum on the Payment System (The National Forum).

The National Forum has several working groups, including one on social efficiency. This body investigates how social efficiency in the Dutch payment system can be improved in the light of key technical trends. Among the issues addressed are cost structures and the effectiveness of incentives for efficient payment behaviour. A second working group, on availability and accessibility, investigates how to safeguard and improve the physical availability and accessibility of payment services for consumers and businesses. For its part, the working group on security is concerned with safeguards to the security of the payment system. Its remit encompasses personal security and the security of payment products.

1.2.3 DNB as overseer

DNB is also responsible for payments and securities oversight. The oversight task pursues dual goals within DNB's wider objective of protecting financial stability. The goals of oversight are to help reduce systemic risk that may arise from payment and securities transactions and to promote the smooth operation of the Dutch payment system.

The scope of oversight comprises all payment systems and products and those securities clearing and settlement systems which are relevant to the Netherlands. DNB exercises oversight on three categories of systems:

- payment systems, such as TARGET2, that settle large-value payments in the Netherlands;

- securities settlement systems, of which the most important are LCH.Clearnet SA (LCH.Clearnet) for the clearing of securities and derivatives, Euroclear Nederland for the settlement of securities and DNB for the settlement of payments. Oversight on this category is conducted jointly with the AFM;
- the retail payments system, including the Clearing and Settlement System (CSS) for processing transactions. Dutch payment products such as electronic purses, debit card payments, direct debit, iDeal and the MasterCard and Visa card brands all come under this heading.

DNB's oversight on payments is mandated by both the Bank Act from 1998 and the EU Treaty. The legal basis for the oversight of securities clearing and settlement systems is provided by the Financial Supervision Act and secondary legislation related to licensing for regulated markets or multilateral trading platforms.

Oversight is conducted by monitoring the systems and products relevant to Dutch payments, assessing them against standards and – if necessary – enforcing changes. Oversight for securities transactions and large-value payments is organised internationally, as these activities have become highly internationalised.

Oversight subject	Lead overseer/regulator	Other overseers/regulators
Interbank large value payments		
TARGET2	ECB	Euro system national central banks
TARGET2-NL	DNB	
EURO1	ECB	Euro system national central banks
CLS	Federal Reserve	G10 central banks and other central banks of the 17 currencies concerned
SWIFT	National Bank of Belgium (NBB)	Other G10 central banks
Securities clearing and settlement		
LCH.Clearnet SA	Rotating presidency regulators from Euronext countries	AFM, DNB and regulators from Belgium, France and Portugal
LCH.Clearnet Group Ltd	Commission Bancaire (France)	AFM, DNB and regulators from Belgium, France, Portugal and the United Kingdom
EMCF	AFM and DNB	FSA and regulators from Denmark, Finland, Hungary, Iceland and Sweden
Euroclear SA	NBB and CBFA	AFM, DNB and regulators from Belgium, Finland, France, Ireland, the UK and Sweden
Euroclear NL	AFM and DNB	
Euroclear ESES	NBB and CBFA	AFM, DNB and regulators from France
EuroCCP	Financial Services Authority (FSA)	AFM and DNB
ECC	BaFin	AFM, DNB and Bundesbank
Retail payments		
Equens (CSS, CSM and Switch)	DNB	
VISA Europe (VISA and V Pay)	ECB	Euro system national central banks
MasterCard Europe (MasterCard and Maestro)	NBB	Other euro system national central banks and ECB
Currence (Chipknip, Acceptgiro, PIN, Incasso, iDEAL)	DNB	
NVB (Urgent payment order)	DNB	
UPSS	DNB	

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

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

DNB works jointly in various configurations with a large number of foreign overseers and regulators. It is only in the retail payment sphere, which is currently still organised along national lines, that DNB continues to work largely independently. The table on the previous page gives an overview of the systems subject to oversight and the institutions responsible for such oversight in 2010.

1.2.4 Cooperation with other institutions

DNB participates in the Holland Financial Centre, a Dutch public-private initiative set up in 2007 by organisations from throughout the financial sector, the public sector and regulators. Its main purpose is to develop initiatives that help ensure the Dutch financial sector remains strong, open and able to compete internationally.

Euroclear SA/NV has set up Market Advisory Committees (MAC) in each country for which it acts as CSD or the central settlement system. In October 2006, the Euroclear SA/NV Board approved the dissolution of the Belgian and Dutch MACs, and a joint Belgian/Dutch Market Advisory Committee (BeNeMAC) was established. After an evaluation at the end of 2011, Euroclear decided to split up the BeNeMAC into separate Belgian and Dutch MACs as of 1 January 2012. In addition to the local MACs, a new ESES MAC was established at the same time, with representatives of the Belgian, Dutch and French MACs. The purpose of the Dutch MAC is to act as Euroclear SA/NV's primary consultation platform for the Dutch securities markets. It also monitors the principles of performance and governance described by Euroclear SA/NV in 2002, which have not been amended. The ESES MAC has the same purpose as the Dutch MAC on an ESES level. The members of the Dutch MAC, and the other MACs, are appointed by the market and approved by the Board of Euroclear SA/NV.

Apart from these formal consultative structures, there are also more informal meetings between representatives at all levels of the Dutch central bank and other market participants. One example is the "Werkgroep Liquiditeit" (Working Group on Liquidity Management), comprising DNB and Dutch banking representatives, which deals with the management and settlement of cash movements resulting from external payments or the cash leg of securities transfers. The Working Group aims to prevent liquidity problems from arising or to solve them smoothly. It is regularly informed about the latest developments by DNB.

In the light of the substantial numbers of changes in the Dutch environment, DNB and the commercial banks set up a consultative structure in order to exchange views about policy objectives formulated by national and international authorities and to communicate their own policy aims.

In late 2008, these contacts led to the foundation of the Dutch Advisory Committee Securities Industry (DACSI). The primary objective of this not-for-profit association is to protect and promote the interests of the users of the securities and derivatives markets infrastructure in the Netherlands and abroad.

At the European level, two managers of DNB's Payments Division are members of the ESCB's Payment and Settlement Systems Committee. Furthermore, numerous ESCB working groups, in which DNB staff participate, are active in the field of payment systems. Cooperation in the field of securities also takes place in the ESCB-ESMA (European Securities and Markets Authority) working group. On a broader international level, the main forum is the Committee on Payment and Settlement Systems of the Bank for International Settlements (BIS), in which two managers of DNB's Payments Division participate. More cooperation with other institutions is described throughout this chapter.

1.3 The role of other private and public sector institutions

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

1.3.1 Institutions in the payment sector

Dutch Banking Association

The Dutch Banking Association (Nederlandse Vereniging van Banken, NVB) was established in 1989 to represent the common interests of the Dutch banks. Representing the common interests of the banking sector, it aims for a strong, healthy and internationally competitive banking industry in the Netherlands. Virtually all banks operating in the Netherlands, including foreign bank branches, belong to the NVB, which is active in many areas of importance to individual banks, including payments. The Committee on Payment Systems, as the main consultative body on payment systems, is concerned with general policy frameworks and joint infrastructures, as well as retail and wholesale products. It heads a number of working groups covering a variety of aspects relating to payment systems.

The NVB also accommodates some collective, non-commercial tasks that support efficient and secure payments. Examples of such activities are the management of account numbers and of Dutch interbank ATM usage (Nationaal Gastgebruik Geldautomaten). The NVB performs secretarial services for the Dutch Association of Electronic Money Institutions (NVIEG).

Currence

Currence is the owner of the uniform Dutch payment products PIN, Chipknip, Acceptgiro, iDEAL and Incasso/Machtigen. It licenses and certifies banks and other operators in the Dutch payment system in the use of these products.

Dutch Payments Association

In 2011, the banks and Currence established the Dutch Payments Association, in which the banking sector accommodates collective, non-commercial undertakings aiming to promote efficient and secure payments. Examples of such activities are the management of account numbers and the coordination of fraud prevention. The scheme was prompted by the increasingly international payment landscape. Dutch payment products are being replaced by European ones and new players are entering the Dutch market. These new players also have an interest in the activities of the NVB and Currence. As of 2011, the collective work will gradually be transferred to the payment entity, which payment institutions may join. DNB will act as an observer in the different forums and the Association will be subject to oversight.

National Forum on Payments

The National Forum on the Payment System (Maatschappelijk Overleg Betalingsverkeer) was set up in 2002 by the Minister of Finance with a mandate to promote the efficiency of the Dutch payment system. The Forum's key aim is to determine how the payments system can be run more efficiently for consumers, businesses and banks alike – which is why it represents both the providers and the users of payment systems, including retailers' and banks' umbrella organisations, the consumer interest association "Consumentenbond" and disabled people's organisations. The Ministry of Finance, the Ministry of Economic Affairs, Agriculture and Innovation, as well as Currence (the Payments Association) are observers. The Forum is chaired by DNB, which also provides secretarial support. The Forum has working groups on social efficiency, availability and accessibility, security and SEPA. The Forum meets twice a year and holds regular consultations on the implications of developments in payment systems.

Equens

Equens is the central clearing institute for retail payments. Set up by the banks, its aim is to promote and maintain efficient payment processing and reliable payment systems. Equens was formed in 2006 out of the merger between Interpay Nederland BV and the German

Transaktionsinstitut für Zahlungsverkehrsdienstleistungen. Since July 2008, Equens has been both a retail payment clearing house and a back office processing service provider.

CCV

In 2007, CCV received a licence from Currence to process PIN transactions. CCV also processes credit, fuel, private label and loyalty cards. CCV is the Dutch market leader in POS terminals.

1.3.2 Institutions in the securities sector

Euronext Amsterdam NV (Euronext Amsterdam)

Euronext Amsterdam, a wholly owned subsidiary of Euronext NV (Euronext), is responsible for the organisation of cash and derivatives markets in the Netherlands. Euronext is the result of a merger in 2000 between Amsterdam Exchanges, the Bourse de Paris and the Brussels Exchange; in 2002, Bolsa de Valores and London International Financial Futures and Option Exchange also joined Euronext. In 2008, Euronext merged with the New York Stock Exchange to form NYSE Euronext, which is incorporated in Delaware, United States.

The Order Machine (TOM) Multilateral Trading Facility (MTF)

TOM started in 2010 as an MTF located in Amsterdam. TOM MTF supports trading in shares that are listed on several exchanges. In the near future, TOM MTF will offer trading in derivatives as well. TOM MTF is a regulated trading venue under the supervision of the Dutch Authority for the Financial Markets. TOM MTF provides banks, brokers, market-makers and other professional market participants with access to high-speed trading in liquid shares.

Euroclear Nederland

Euroclear Nederland, the central securities depository in the Netherlands, has been part of the Euroclear Group since 2002. Pursuant to the Securities Giro and Transfer Act, Euroclear Nederland is responsible for book-entry transactions, as well as the custody, management and administration of securities on behalf of its participants.

The Euroclear Interprofessional Securities Centre (ENIEC) is a sister company of Euroclear Nederland. As of the launch of the Euroclear Settlement of Euronext zone Securities platform in January 2009, its activities have been limited to the tasks of the national numbering agency and the cancellation of securities.

Authority for the Financial Markets

The Netherlands Authority for the Financial Markets (AFM) has been responsible for supervising the operation of the financial markets in the Netherlands since 2002. This means that AFM supervises the conduct of the entire financial market sector, including savings, investment, insurance and loans. AFM is the successor of the Stichting Toezicht Effectenverkeer (Securities Board of the Netherlands), which previously supervised participants in the securities markets. The AFM was established after a review of financial market sector supervision by the Ministry of Finance. As a result, sector-based supervision was replaced by function-based supervision, divided into prudential and market conduct supervision. DNB has been responsible for prudential supervision since its merger with the Pensions and Insurance Board (Pensioen- & Verzekeringskamer) in 2004. At the international level, AFM is the Dutch representative at the International Organization of Securities Commissions (IOSCO) and the European Securities and Markets Authority.

Dutch Securities Institute

The Dutch Securities Institute (DSI) was created in 1999 on the initiative of Amsterdam Exchanges, the stock exchange for the Netherlands. The DSI aims to underpin investor and consumer confidence by upholding the quality and integrity of the financial industry workforce. DSI registration is granted to financial industry employees after a screening process that ensures they meet strict standards of expertise, integrity and experience. To retain their registration, holders must pursue continuing education and observe the DSI code of conduct. Sanctions may be applied if the code is breached.

Association of Stockholders

The Association of Stockholders (Vereniging van Effectenbezitters, VEB), founded in 1924, aims to promote the interests of private and institutional stockholders and stockholding in general. The VEB seeks to achieve its goals by attending shareholders' meetings, asserting voting rights, arranging collective actions, and by providing information and organising seminars.

2. Payment media used by non-banks

2.1 Cash payments

Banknotes and coins are the media used for cash payments. Both are legal tender, although the acceptance of coins by the public is compulsory only to certain maximum amounts. Under the terms of the Coinage Act 2002, coins are produced by the Royal Mint, an institution supervised by the Ministry of Finance. In accordance with Article 105a of the Treaty establishing the European Community, "the ECB has the exclusive right to authorise the issue of banknotes. The ECB and the national central banks may issue such notes". With reference to the Treaty, the Bank Act 1998 stipulates that DNB has the sole right to issue banknotes in the Netherlands.

At the end of 2010, the currency in circulation consisted of seven denominations of banknotes (EUR 500, 200, 100, 50, 20, 10 and 5) and eight denominations of coins (EUR 2, 1, 0.50, 0.20, 0.10, 0.05, 0.02 and 0.01). Since September 2004, the total amount paid in cash at most retailers has been rounded off to the nearest multiple of 5 eurocents. Although the 1 and 2 eurocent coins remain legal tender, the rounding off has limited their use, leading to cost savings for retailers and greater convenience for consumers.

Since the introduction of euro cash, the number of euro coins and notes in circulation within the Netherlands has been unknown. However, it is certain that DNB and the commercial banks have been processing fewer banknotes during the past years. This is in accordance with the gradual decline in the use of cash in the Netherlands. The most commonly used banknotes in the country are the EUR 50 and lower denominations. Of the coins, the EUR 0.05 is the most frequently used.

2.2 Non-cash payments

2.2.1 Non-cash payment instruments

Non-cash payments are made by transferring money deposited in a payments account, to which the account holder has direct access, by ordering the bank to transfer the desired amount. Most households and businesses hold one or more accounts. At the end of 2010, there were about 24 million accounts, of which around 2.6 million were business accounts. Nearly all transactions in trade and industry are settled by non-cash payments.

In 2010, about 5.2 billion non-cash transactions were made for a total value of around EUR 5,500 billion. In order to transfer deposited money, Dutch banks offer a range of payment instruments that includes credit transfers, direct debits, payment cards and urgent payments.

2.2.1.1 Credit transfers

Almost all remote payments in trade and industry as well as a significant part of household payments are made in the form of credit transfers. Credit transfers are prominent in the Netherlands, accounting for 11.9% of the total volume and 47.7% of the total value of retail payments. The formats for credit transfers have been standardised between banks and are also used by the public sector. After the direct debit, the electronic credit transfer is the most frequent method of remote payment. The growing use of internet banking contributes to this development.

For efficient processing, Dutch banks offer two types of pre-arranged credit transfers: the standing order and the “inpayment transfer” or *acceptgiro*. In order to pay recurrent bills, an account holder may choose to set up a standing order with the bank, on fixed dates, for fixed amounts and for a designated payee account. Standing orders are frequently used for rent, subscriptions, insurance premiums etc. On the fixed date, the bank effects the transfer and no further action on the part of either the account holder or the payee is required.

When using an *acceptgiro*, the payee sends the payer a fully prepared transfer form together with the invoice. In most cases, the payer’s account number, name and address are pre-printed on the form, as in previous payments. The payer signs the form and sends it to his or her bank. This instrument is used for both regular payments and non-regular payments of either fixed or varying amounts. Traditionally, the *acceptgiro* has been a paper-based instrument that is processed mainly via scanned image data. But today most *acceptgiro* data reach banks in digital form. Account holders use electronic banking applications to deliver their payment orders and are thus responsible for converting the relevant data into electronic form. Banks offer web-based electronic billing applications by which invoices and *acceptgiros* can be sent and received.

2.2.1.2 Direct debits

In 2010, direct debits accounted for 12.8% of all retail payments by volume and 5.0% by value. A direct debit is established when the payer signs a mandate authorising the payee to charge the former’s account for invoiced goods or services. The transfer is initiated by the payee, who sends the payment order electronically to the bank with instructions to collect the money by debiting the debtor’s account in favour of its own account. The payer can, however, in most cases have the payment reversed within a set period (payback guarantee).

Direct debits are frequently used for collecting recurrent payments, such as those to public utilities and telephone companies. The electronic form and the short processing route make the direct debit a very efficient means of collecting such payments. Dutch banks offer several types of direct debit providing for specific needs, such as the purchase of lottery tickets (which have no payback guarantee).

2.2.1.3 Payment cards

At the end of 2010, some 30.2 million payment cards were in issue in the Netherlands (comprising 6 million credit cards and 24.4 million debit cards). The following types of payment cards are in circulation: debit cards, credit cards, loyalty cards and prepaid cards (single-purpose and multipurpose).

Debit cards

Debit cards are cards that afford direct electronic access to a bank account with the use of a personal identification number (PIN). The majority of debit cards have a magnetic stripe as

well as an EMV chip. At the end of 2010, almost all cards complied with the new European standards, which require the more secure EMV chip that will ultimately replace the magnetic stripe. The Dutch debit card brand PIN will disappear in SEPA; instead Dutch banks have chosen to issue Maestro and V-Pay debit cards. Three types of debit functions can be distinguished: withdrawal, payment and identification in the context of payments. Debit cards are used to make withdrawals, either in cash at an ATM or in electronic money by loading an electronic purse. In 2010, some 434 million cash withdrawals were made with an average amount of EUR 120 per transaction. All 7,919 ATMs in the Netherlands are interoperable and connected to the international ATM networks. For security purposes, the use of another bank's ATM is subject to a daily limit in terms of both the number of withdrawals and the amount withdrawn.

Debit cards are used mainly at EFTPOS terminals in shops, restaurants, hotels etc. In 2010, the total volume of EFTPOS terminal transactions exceeded 2 billion, accounting for a total value of EUR 79 billion, which corresponds to 20.5% of all retail payments but only 1.4% of the total value of retail payments. At the end of 2010, 259,000 EFTPOS terminals were in operation.

Debit cards are also increasingly used as an electronic identification device to authorise credit transfers made by telephone or through the internet.

Credit cards

The total number of credit cards in circulation increased to 6 million in 2010. The number of credit card transactions is relatively small, accounting for only 0.35% of retail payments. Since most Dutch banks issue MasterCard, this is the most used brand. Although few banks issue Visa, the number of issued Visa cards is high owing to Visa's co-branding strategy with non-financial institutions (insurers, automobile associations, etc). Some retail chains promote their own retailer cards (private label cards), but from a payment point of view their role is insignificant compared with the use of label cards and cash.

Prepaid cards

A prepaid card is a payment card which contains purchasing power that is paid for in advance. The most widespread prepaid card in the Netherlands is the *Chipknip*. The *Chipknip* is an electronic purse that is incorporated in the debit card. For consumers, the main use of the electronic purse is to make small-value payments. The electronic purse is used mainly in specific contexts, such as parking and vending machines. In 2010, 1.74% of retail payments were made with the *Chipknip*.

Public transport card

Another prepaid card, phased in since January 2009, is the *OV-chipkaart*. The *OV-chipkaart* is a public transport card. In 2010, more than 900 million transactions were made with the *OV-chipkaart*, which include paying transport fares, as well as loading and reloading money onto the card. In the near future use of the *OV-chipkaart* may be extended to low-value payments made at train stations.

2.2.1.4 Urgent payment

In 2007, the interbank system that processes urgent payments was upgraded to shorten processing times. In the new setup, urgent payments are processed individually via either TARGET2 or the Euro Banking Association's Euro1/Step1 clearing. The role of Equens has changed. Whereas previously Equens did the processing, Equens today supports the banks with BIC IBAN account information. This service converts the domestic account number format (BBAN) into the BIC IBAN number required for processing in Euro 1 or TARGET2. The specific facilities at DNB for processing and settlement have become redundant. Total processing time has now fallen to a maximum of one and a half hours, which is faster than

the current SEPA standard of one day for urgent payments. Although the volume of urgent payments has fallen since 2002, the average amount per transaction has increased. This is because fast and cheaper alternatives such as internet banking have become available for rapid transfers of relatively small amounts. However, these new methods are not suitable for large-value business transactions.

2.2.2 Non-cash payment terminals

E-payment scheme iDEAL

iDEAL is a payment method for making online payments directly between bank accounts, from a consumer to a merchant, via an internet e-banking application. Merchants can offer this method on their website at the end of an ordering process and automatically refer their customers to the iDEAL payment area. Developed by the three largest Dutch banks (ABN Amro, ING and Rabobank), the iDEAL payment method was introduced in October 2005. Other consumer banks joined iDEAL later, bringing the total of participating banks to eight in 2010. At the moment, iDEAL can only be used for online payments between consumers and businesses or institutions that hold a Dutch bank account. In 2006, its first full year of operations, iDEAL processed 5 million transactions. By the end of 2010, the annual volume of transactions had grown to 63 million transactions for a total value of EUR 5.2 billion.

Banks do not charge consumers for using iDEAL. But iDEAL accepting merchants do pay a charge per transaction, as determined by their acquirers. For both consumers and merchants, confirmation of a payment is immediate. The fact that iDEAL runs within the familiar and secure environment of consumers' own e-banking website and the direct guaranteed payment have proven to be iDEAL's success factors.

Standard Electronic Bill Presentment and Payment

In 2006, the same combination of Dutch banks that introduced iDEAL (ABN Amro, ING and Rabobank), in cooperation with biller service providers (BSPs), developed a standard for sending bills electronically; the so-called *Standaard Digitale Nota* (SDN). The aim is to replace the sending of paper-based bills through the post.

The SDN is a standard for the presentation of electronic invoices within the customers' e-banking environment. It defines a process for the exchange of data between BSPs (on behalf of invoice senders) and bank portals. The payment of the bill itself is similar to a regular credit transfer or direct debit initiated within the e-banking environment, except that all information fields are already filled in. Thus consumers do not need to type out the invoice details.

The receipt and payment of electronic invoices is free of charge. But businesses and institutions delivering bills electronically using SDN do pay a fee to their BSP. The main advantage of SDN is that it is a collective standard used by three large banks, and in the future presumably more. The development of SDN as a single common standard is believed to have had a positive impact on the acceptance and usage of electronic bills.

2.2.3 Interchange fee regulation

In the past, Dutch banks made multilateral agreements on the level of interchange fees for giro collection forms, direct debits and non-customer ATM withdrawals. These multilateral arrangements, endorsed by the Netherlands Competition Authority, expired in 2007 (for direct debit) and in 2008 (for giro collection forms and non-customer ATM withdrawals). Since then, Dutch banks have made bilateral interchange fee arrangements for these three payment instruments.

For credit card payments, Dutch banks apply the default interchange fees set by international credit card schemes. Multilateral interchange fees (MIF) for debit card payments of the

domestic PIN scheme have never been levied. But large Dutch banks have bilateral agreements on interchange fees for domestic debit card payments. These arrangements are also applied to domestic debit card payments with the Maestro and V-Pay international debit card schemes of MasterCard and Visa Europe respectively.

3. Payment systems

3.1 General overview

Cashless payments are processed in interconnected payment systems:

- the TARGET2 system of the Eurosystem for wholesale payments; and
- the Equens automated clearing house for retail payments and the CCV retail payment processor.

3.2 The real-time gross settlement system: TARGET2-NL

TARGET2-NL is the Dutch component of TARGET2, the Eurosystem's real-time gross settlement system for large-value payments in euros. It provides settlement finality in central bank money. The total daily average transaction volume in TARGET2-NL in 2010 was 33,000 payments, with a total value per day of EUR 294 billion. The average value per transaction amounted to EUR 8.9 million.

3.2.1 Institutional framework

DNB offers current account facilities to supervised credit institutions, allowing them to fulfil their reserve requirements on these accounts and permitting the settlement of payment transactions on its books. Although TARGET2-NL is, in principle, intended to handle only large-value interbank payments, there are in fact no upper or lower value bounds. Thus the system is also used for urgent customer payments. Further, TARGET2-NL offers settlement services to the retail clearing by Equens and provides the settlement link for securities settlement by Euroclear Nederland. The Dutch Treasury also uses TARGET2-NL.

Apart from TARGET2-NL, DNB offers accounts in the Home Accounting Module (HAM), another Dutch designated system, in which liquidity transfers take place. The HAM is used by some TARGET-eligible credit institutions that are not involved in the payments business to fulfil their minimum reserve requirements. DNB also uses the HAM to provide services to central banks outside the euro area.

3.2.2 Participation

The access criteria for TARGET2-NL are the same as for all TARGET2 component systems. TARGET2-NL has 70 direct participants, 44 indirect participants, 31 HAM account holders that meet the access criteria of TARGET2 and some HAM account holders that are customers of DNB but do not meet the TARGET2 access criteria (status as per December 2010). Participants include Equens, Euroclear Nederland and the Dutch Treasury.

3.2.3 Types of transaction

See the descriptive Red Book chapter on the euro area.

3.2.4 Operation of the system and settlement procedures

For operation of the system and settlement procedures see the descriptive Red Book chapter on the euro area.

3.2.5 Risk management

TARGET2-NL and DNB's local infrastructure comply with the TARGET2 Risk Management Framework as set out in the descriptive Red Book chapter on the euro area.

3.2.6 Pricing

The fees of TARGET2-NL are defined by the TARGET2 single pricing structure. For its part, the HAM (Home Accounting Module) levies a fixed fee of EUR 100 per month and a transaction fee of EUR 0.80.

3.2.7 Major ongoing and future projects

Major ongoing and future projects in TARGET2 are described in the descriptive Red Book chapter on the euro area.

3.3 Retail payment systems

3.3.1 Equens

Equens was formed in 2006 from the merger between Interpay Nederland BV and the German Transaktionsinstitut für Zahlungsverkehrsdienstleistungen. Since July 2008, Equens has been a Societas Europaea (Equens SE),⁷ a public limited liability company governed by a European body of law based on an EU directive.

With clients and partnerships in many European countries, the company offers pan-European market coverage for payment processing from offices in four countries – the Netherlands, Germany, Italy and Finland. With an annual processing volume of 9.7 billion payments and 3.9 billion POS and ATM transactions, Equens has a European market share of more than 12.5% as of 2010.

3.3.1.1 Institutional framework

The Equens Group comprises Equens SE and Equens SpA. Equens SpA was founded in 2008 as a 50/50 joint venture of the Italian ICBPI Group and Equens SE. Since January 2011, it has been a 100% subsidiary of Equens SE.

Equens SE is the central holding company with its corporate seat in Utrecht (Netherlands), as well as permanent establishments in Germany (Frankfurt and Stuttgart) and in Italy (Milan and Rome) and a representative office in Finland (Helsinki). The Payment Services Directive is applicable to the payment instruments processed by retail clearing houses such as Equens.

3.3.1.2 Participation

All Dutch deposit-taking banks participate in the clearing by Equens for Dutch payment products. Dutch banks as well as banks licensed in other European countries participate in the clearing of SEPA products. For SEPA transactions there are 42 participants and for non-SEPA transactions there are 47 participants.

⁷ A Societas Europaea, also referred to as a "Europe Inc" or "Europa AG", is a legal form under EU law.

3.3.1.3 Types of transaction

The company handles all types of Dutch current retail transactions and all types of SEPA products.

3.3.1.4 Operation of the system and settlement procedures

(a) Clearing and Settlement System (CSS)

Dutch domestic payment products are processed by the Clearing and Settlement System (CSS). CSS employs the lot settlement method, by which payment orders are processed frequently and settled at least every 30 minutes. The clearing amounts are notified to DNB, where every Dutch-based bank has an account in the TARGET2-NL system. Equens is authorised to instruct DNB to debit and credit these accounts in order to settle the payments. Once settlement has taken place, the banks inform their own account holders about changes to their bank balances, on the basis of the processing data they receive from Equens.

(b) Clearing and Settlement Mechanism (CSM)

The Equens CSM is a system for the clearing of SEPA payments. Participating banks send their SEPA payments to this CSM for clearing, through one of the different routes this CSM offers. Payments destined for other participants of the Equens CSM are settled within the Equens community. Payments destined for participants of CSMs linked to the Equens CSM are settled through European Automated Clearing House Association (EACHA).⁸

Finally, payments destined for other banks are settled through the EBA link. DNB offers Equens access to EBA's STEP2 clearing, by acting as a participant in STEP2. Equens offers the clearing and settlement of SEPA payments, both SEPA Credit Transfer (SCT) and SEPA Direct Debit (SDD). Independently of the route chosen, payments are settled in TARGET2. This settlement also takes place in lots.

For the clearing and settlement process, there is no difference between different types of payments (SCT or SDD). Equens provides a so-called Reach Table to the participants, which shows which banks can be accessed via which route. The payments flow is shown in the functional descriptions. Approximately 30 banks participate directly in Equens CSM, while Equens SpA uses the platform for the clearing of ICBPI payments.

(c) Dutch Interbank Authorisation Network (Equens switch)

In addition to the CSS, Equens manages the Dutch Interbank Authorisation Network (also known as the Equens switch), which facilitates, among other things, debit and credit card authorisations and transactions that use the PIN code as a means of identification (for cash withdrawals, point of sale payments, *Chipknip* loading etc).

3.3.1.5 Risk management

A retail system inherently faces low credit or liquidity risks. The systems operated by Equens do not provide intraday liquidity. Liquidity risks are mitigated primarily through the settlement via TARGET2, in which participants are required to provide sufficient liquidity to allow settlement. Furthermore, as Equens only settles participants' *net* positions and given the relatively limited size of the retail payment balances (in comparison to large-value wholesale systems), liquidity risks are of minor importance in the Equens systems.

3.3.1.6 Pricing

Equens is a commercial payments processor pursuing a market-driven pricing strategy.

⁸ EACHA is a network of CSMs with full coverage of banks within SEPA.

3.3.1.7 Major ongoing and future projects

(a) Domestic to SEPA migration services

Equens will facilitate the migration of its domestic clients to SEPA by offering conversion services. Domestic services that are designated as essential to domestic clients will be migrated to SEPA. Various other migration services offered will enable domestic clients to migrate without duplicate processing in their systems.

(b) Strategic perspective

Equens' strategy is geared towards realising further growth and economies of scale, with the aim of providing sustainable (financial) benefits to its clients. This growth is based on mergers, strategic partnerships and organic growth from the existing client base. Examples from 2010 are:

- acquisition of Montrada GmbH, which operates as an independent card services enterprise offering a complete service package for cashless payments. This ranges from consultancy to selecting the ideal payment method to providing on-site terminal installations and customer support; and
- Paysquare insourcing; Paysquare's processing has been insourced to Equens, combining the two organisations' business volumes. This has resulted in economies of scale and better service to new and existing clients.

3.3.2 CCV

In 2007, CCV received a licence from Currence to process PIN transactions. CCV also processes credit, fuel, private label and loyalty cards. CCV is the Dutch market leader in POS terminals.

3.3.2.1 Institutional framework

CCV is the trade name for a privately held group of companies with Van de Velden Holding BV as the parent company. In the Netherlands, CCV operates via the legal entity CCV Holland BV. Since the implementation of the PSD on 1 November 2010, CCV has been subject to supervision by DNB. The transaction processing and acquiring host processing activities are performed by the legal entity Computercentrum C van de Velden BV, whose shares are held by CCV Holland BV.

3.3.2.2 Participation

Participants include approximately 40 acquirers, issuers, banking networks and processors in the Netherlands, Belgium, Germany, Switzerland, the United Kingdom, Italy, Japan and China. The connected debit card acquirers are all Dutch banks. The connected credit card acquirers are located in the above-mentioned countries.

3.3.2.3 Types of transaction

CCV handles all sorts of retail and fuel card transactions in the Netherlands and all sorts of payment card transactions in Germany, Belgium and Luxembourg. In 2010, CCV processed almost 130 million transactions in the Netherlands.

3.3.2.4 Operation of the system and settlement procedures

CCV processes online authorisation messages for issuers. CCV performs these switching services for several petrol companies and credit card companies such as Visa, MasterCard, American Express, Diners etc. In addition, CCV delivers clearing files to all types of acquirer.

CCV acts as an acquirer host processor for several banks in the Netherlands. Since the end of 2008, CCV has also been an acceptant payment service provider in accordance with the

rules and regulations of Currence for the Dutch PIN brand. The PIN process is completely automated. Retail PIN payments are collected on behalf of and paid out to merchants via a separate institution (“Stichting Derdengelden CCV”) to ensure that funds received from the payment service users are not commingled at any time with funds from other CCV activities.

3.3.2.5 Pricing

Pricing is market-driven.

3.3.2.6 Major ongoing and future projects

A major current project is the migration from non-EMV-based Dutch PIN payment cards, terminals and processing to EMV-based Maestro and V-Pay equivalents.

4. Systems for post-trade processing, clearing and securities settlement

The Dutch securities landscape is currently in a state of change. In May 2010, NYSE Euronext, the US-European exchange that operates exchanges in Amsterdam, Brussels, Lisbon, London, New York and Paris cancelled its clearing contracts with the central counterparty LCH.Clearnet SA. For this reason, the derivatives clearing services were scheduled to be discontinued in mid-2012 and cash clearing at the end of 2012. NYSE Euronext had planned to set up its own central counterparty services in Europe.

However, in February 2011, NYSE Euronext and Deutsche Börse announced their intention to merge. Had the merger gone through, it would have definitely affected the post-trade situation in the Netherlands. For that reason the duration of the clearing contracts between NYSE Euronext and LCH.Clearnet SA was extended by one year and will now end in 2013. However, the European Commission blocked the merger in February 2012. NYSE Euronext is now investigating the options of setting up a new CCP, extending the contract with LCH.Clearnet and/or selecting another CCP.

4.1 General overview

The regulated market in the Netherlands is organised by Euronext Amsterdam NV. Clearing of securities and derivatives traded on the stock exchange of Amsterdam (and those of Brussels, Lisbon and Paris) is provided by LCH.Clearnet SA. In addition to the regulated market, Euronext Amsterdam also operates two multilateral trading facilities (MTF) in the Netherlands: NYSE Arca Europe and NYSE Alternext Amsterdam. The first provides a high-frequency trading platform for European blue chips, while the latter offers a listing and trading platform for small and medium-sized companies.

Besides the three trading venues operated by NYSE Euronext, the Netherlands has a fourth trading venue. The Order Machine (TOM) is a Dutch MTF established in 2010 that offers trading in listed Belgian, Dutch and French blue chips and Dutch mid-cap shares. In 2011, exchange-traded funds and derivatives were added to TOM's product range. TOM has chosen European Multilateral Clearing Facility NV (EMCF) to act as clearing provider for the cash trades executed on its trading platform and Holland Clearing House (HCH) for derivatives trades.

All Dutch securities settle on the ESES single settlement and custody platform, which is operated by the Euroclear Group. Since January 2009, when ESES was launched in the Dutch market, DNB has outsourced the settlement of the cash legs to Euroclear Nederland, but they still take place in TARGET2-NL.

4.2 Central counterparties and clearing systems

4.2.1 LCH.Clearnet SA

Institutional framework

LCH.Clearnet SA is a wholly owned subsidiary of LCH.Clearnet Group Ltd, which is majority-owned (83%) by its clients. The remaining shareholders (17%) are exchanges. LCH.Clearnet SA is incorporated in France, but has a branch in Amsterdam. This section provides a brief overview of LCH.Clearnet SA's characteristics and services. For more information, see the descriptive Red Book chapters on France and the euro area.

LCH.Clearnet SA is regulated as a credit institution and a clearing house by a regulatory college consisting of representatives of the market regulators and national central banks from the jurisdictions of Belgium, France, the Netherlands and Portugal. In addition, LCH.Clearnet SA is also regulated as a recognised overseas clearing house by the United Kingdom's Financial Service Authority and by other market regulators and central banks within jurisdictions where LCH.Clearnet SA provides services.

Types of products

LCH.Clearnet SA is the central counterparty (CCP) for securities and derivatives trades executed on Euronext Amsterdam. In December 2010, LCH.Clearnet replaced its Clearing 21 securities clearing system with the UCS system. The Clearing 21 system is still used for derivatives clearing, but will be replaced by UCS at the end of 2012. LCH.Clearnet acts as the CCP and guarantees the settlement of all transactions. Throughout the trading day, trades are entered automatically and in real time into the UCS securities clearing system or Clearing 21 derivatives clearing system. LCH.Clearnet becomes a counterparty (by novation) to both parties in a transaction as soon as the trade has been processed and transaction confirmation reports have been sent to the clearing members. By positioning itself between both parties, LCH.Clearnet guarantees the completion of every transaction.

Participation

Clearing of LCH.Clearnet is based on a layered clearing member structure: the clearing organisation forms the top layer, the general clearing members are in the layer below, followed by the clearing members and their customers. In principle, the clearing organisation deals with the clearing member only, and the clearing member in turn deals with its customers. This is also referred to as the principal-to-principal relationship. A participating clearing member may become a general clearing member or a direct clearing member. Direct clearing members are only permitted to clear transactions for their own company. General clearing members can also settle transactions on behalf of other exchange members, which in turn have their own customers.

Operations

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

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

The clearing organisation acts as the CCP in transactions. In the event of default by one of the parties, it may itself have to purchase the securities to be delivered by the defaulting

party or, in the case of an obligation to purchase, to sell the purchased securities. Consequently, it is also exposed to market risk arising from unexpected price movements. To that end, it obliges clearing members to provide collateral to equalise the margins required to fulfil the financial obligations. These margins are calculated on the basis of the obligations ensuing from positions taken (initial margin) and from non-realised profits and losses (variation margin). The collateral may consist of underlying instruments (cover on Euronext Amsterdam), domestic or foreign securities, or debt instruments. At the end of 2010, the total variation margin due to cash and derivatives clearing deposited with LCH.Clearnet amounted to EUR 687 million.

In addition to the margin requirements, a clearing fund extends a joint guarantee to clearing members. In return, clearing members pledge securities as collateral. The clearing fund's size is computed on the basis of contributed risk. The total clearing fund for the cash market should, at a minimum, cover the price risk that arises for the clearing member with the largest position. The total clearing fund for the derivatives clearing is calculated on the basis of clearing members' average number of open options in a certain option fund or option series multiplied by a fixed amount per contract. The clearing fund for cash and derivatives clearing amounted to EUR 161 million on 31 December 2010.

4.2.2 European Multilateral Clearing Facility (EMCF)

Legal and institutional framework

EMCF is a clearing house that was founded in 2007 to provide post-trade services for Chi-X, a London-based MTF. Together with Chi-X, EMCF has grown rapidly in recent years. EMCF is currently owned by ABN AMRO Bank NV (78%) and by NASDAQ OMX AB (22%). Based and registered in the Netherlands, EMCF operates under Dutch law. In the Netherlands, EMCF is supervised by the AFM and by DNB. The supervision is performed in accordance with the ESCB-CESR recommendations for central counterparties. For lack of statutory provisions for oversight, a tri-party agreement with AFM and DNB – based on the licence granted to TOM, for which EMCF performs clearing – serves as legal basis for the supervision. Parallel to this, EMCF has been granted recognised overseas clearing house status in the United Kingdom. For the supervision of EMCF, the Financial Services Authority largely relies on DNB and the AFM.

Types of transaction

EMCF provides CCP services for the main cash equities (blue chips) traded on several stock exchanges and multilateral trading facilities throughout Europe. One of them is the Dutch MTF TOM. In total, EMCF provides CCP services to more than 50 clearing participants in 19 European markets.

Participation

The following three types of market participant are distinguished:

1. the non-clearing participant, who executes trades on the trading platform but clears through a general clearing participant;
2. the direct clearing participant, who executes trades on the trading platform and clears its own business; and
3. the general clearing participant, who may execute trades on the trading platform and, subsequently, clear its own business, but who may also clear for third-party trading firms.

EMCF provides services to direct and general clearing participants. Any applicant wishing to be recognised as a clearing participant must meet the requirements set out in EMCF's Clearing Rule Book.

Operation of the system

EMCF uses novation to interpose itself between the buyer and the seller as the legal counterparty for both trade legs, ie EMCF legally becomes the seller to the buyer and the buyer to the seller. Two new contracts are created to replace the single contract between the two original parties. When the EMCF's MTM system has accepted (novated) the trade, EMCF sends a real-time acknowledgement to the exchange or MTF concerned.

As soon as a trade has been novated, it is netted in real time on a multilateral basis. Per clearing participant, netting is done per ISIN, per currency, and per account type (client, house or combined), at a level that can be specified by the clearing participant. EMCF uses the trade date netting model.

Since settlement always occurs at the local central securities depository (CSD), EMCF sends settlement instructions to the domestic CSD as soon as practicable for all markets covered, which is generally in the evening of the trading day. To do so, EMCF operates either its own CSD accounts or uses the services of settlement agents and/or account operators. In general, the net settlements of EMCF are treated as OTC transactions in the local CSDs. Regular DVP/RVP instructions are generally communicated to the CSD. This means that both EMCF and the clearing participant must send settlement instructions to the CSD. Consequently, these instructions need to match in order for the settlement to be effected. If a netted settlement instruction is not matched or delivered in time, the clearing participant can be fined as part of EMCF's settlement discipline regime. In markets supporting partial settlements, partial settlements will only take place at EMCF's request.

For the purpose of finality (and efficiency), EMCF plans to eliminate the settlement agents from its process flows. To this end, EMCF will open its own CSD and central bank accounts and obtain power of attorney from its clearing participants permitting it to act as an account operator on their behalf. The new arrangements will be phased in gradually in view of regulatory and other third-party dependencies.

Risk management

The risk management model of EMCF consists of four layers:

1. Admission requirements: only qualified, bona fide firms that comply with EMCF's admission requirements are permitted to join EMCF as clearing participants.

This layer provides assurance that all clearing participants are qualified to serve as clearing participants. Clearing participants have to meet a minimum initial capital requirement of:

- EUR 7.5 million, for a direct clearing member;
- EUR 25 million, for a general clearing participant.

In addition, EMCF monitors the financial and operational situation of all clearing participants.

2. Collateral: EMCF requires clearing participants to meet margin requirements for the portfolio by depositing collateral at EMCF.

The collateral deposited by the clearing participants should provide assurance that the portfolio of the defaulting clearing participant can be liquidated in case of a default under normal or mildly extreme circumstances without additional costs for other clearing participants. EMCF charges a single margin that comprises both the variation margin and the initial margin. Variation margin is the unrealised profit or loss on the portfolio currently in position. Initial margin is the maximum theoretical loss of the portfolio given the margin parameters. EMCF has devised its own margin calculation methodology, which is known as the Correlation Haircut. EMCF calculates both the initial and variation margin continuously during the day on the

basis of the latest positions and prices and reserves the right to call for extra intraday margin.

3. Clearing fund: in the event of default by a clearing participant, and if the collateral of the defaulting participant does not cover the liquidation of its portfolio, the clearing fund provides an additional buffer.

The clearing fund is designed to cover losses arising from a default that are not covered by the defaulting participant's margin payments or collateral. Based on stress tests performed by EMCF, the clearing fund's size is set at a level that would allow it to cover potential losses arising from extreme but plausible market circumstances. All clearing participants contribute to the clearing fund. The contribution is a percentage of the daily margin requirement with a minimum of EUR 1 million for direct clearing participants and EUR 3 million for general clearing participants. The contribution can be covered by a letter of credit, cash or bonds.

4. EMCF's own capital and that of EMCF's parent bank ie ABN AMRO NV. If the clearing is depleted, EMCF's capital and that of its parent will be called upon.

The capital of EMCF and/or that of its parent bank would be used to cover losses from defaults resulting from unlikely circumstances. ABN AMRO NV extends a so-called 403 guarantee in favour of EMCF, under which the bank is pledged to cover EMCF's obligations if the CCP can no longer meet them.

4.2.3 Holland Clearing House

Holland Clearing House NV (HCH), an ABN AMRO NV group member, is a CCP for derivatives for the TOM MTF. HCH interposes itself between buyer and seller by using the open offer technique. It is regulated and supervised in the Netherlands by the AFM and DNB. As HCH gained the AFM's and DNB's approval as recently as June 2011 and derivatives trading on TOM started only in July 2011, HCH's clearing volumes and market share are still small.

4.3 Securities settlement system

Euroclear Nederland operates the securities settlement system and is the central securities depository (CSD) of the Netherlands. Euroclear Nederland is a subsidiary of Euroclear SA/NV, which is itself a subsidiary of Euroclear PLC. Euroclear PLC is majority-owned (87%) by its users, with the remaining 13% interest held by Sicovam Holding, the former CSD in France. For further details, see the descriptive Red Book chapter on the euro area.

Participation

The participants in Euroclear Nederland are known as admitted institutions ("aangesloten instelling"). Admitted institutions must fall within one of the following categories:

- the Dutch State as represented by the Agent of the Ministry of Finance in the Netherlands;
- credit institutions from the European Economic Area;
- investment firms from the European Economic Area;
- central securities depositories of a member state of the European Economic Area;
- national central banks participating in the European System of Central Banks;
- public institutions of a member state of the European Economic Area; or
- clearing institutions under appropriate regulatory supervision.

At the end of 2010, Euroclear Nederland had 70 admitted institutions; 17 from the Netherlands and 53 from other jurisdictions.

Regulatory framework

The legal basis for the performance of oversight on Euroclear Nederland systems is provided by the Financial Supervision Act (“Wet op het financieel toezicht (Wft”).

Under Section 5.26 of the Act, the Dutch Minister of Finance is authorised to impose restrictions and conditions governing the granting of the recognised status of a market in financial instruments. For Euronext, this has been accomplished by means of the official recognition or license agreement from the Minister of Finance.

Euronext’s license agreement (or official recognition) stipulates that Euronext NV and Euronext Amsterdam NV must ensure that the clearing and settlement systems used on Dutch securities exchanges adhere to the rules laid down in the Euronext Oversight Framework for Clearing and Settlement. This framework was developed by the AFM and DNB, who are jointly responsible for the oversight of the (clearing and) settlement system.

Types of assets and products settled

It is only possible to settle transactions in Euroclear Nederland if the securities concerned have Euroclear Nederland as their CSD of Reference.⁹ Transactions in securities can be settled in two different ways: netted for transactions done on an exchange (on-exchange settlements) or trade-for-trade for OTC transactions (off-exchange settlements).

On-exchange settlement

The vast majority of all stock exchange settlements are processed in the netting system. At the end of the trading day T, the clearing house LCH.Clearnet determines the numbers of different securities that each clearing member should deliver or receive and the accompanying cash amounts. To calculate the net settlements, LCH.Clearnet uses the continuous net settlement method. This means that, at the end of T+2, after Euroclear Nederland is closed for DVP settlements, LCH.Clearnet determines for each clearing member the positions they failed to deliver and the deliveries or receipts that result from exercises, assignments or settlements of derivatives. Next, LCH.Clearnet corrects the netted positions calculated on T for the fails and the settlements caused by derivatives. Subsequently, they send the settlement instructions, both for receipt and delivery, to the ESES platform for settlement on the contractual settlement date (S or T+3). In 2010, LCH.Clearnet sent 1,678,000 netted settlements to Euroclear Nederland for a total value of EUR 239 billion.

Off-exchange settlement

In addition to the settlement of on-exchange transactions and free-of-payment transfers, ESES offers a facility for DVP settlement of off-exchange transactions (OTC transactions). Each transaction is settled individually and with immediate finality. The settlement is a true DVP settlement, which means that securities and fund transfers are made simultaneously in real time between the participant’s ESES securities accounts and the ESES cash accounts. ESES is available for DVP settlements between 21:00 on the day before the contractual settlement date (S–1) and 16:00 on the contractual settlement date (S). In 2010, Euroclear

⁹ The CSD of Reference is the Euroclear CSD that is entitled to admit a security based on the allocation rules set out in the ESES terms and conditions. Only one Euroclear CSD can be the CSD of Reference for a specific security.

Nederland processed more than 3.3 million OTC transactions with a total value of EUR 4,990 billion.

Explanation of settlement process

In January 2009, Euroclear SA/NV introduced the ESES platform into the Dutch, Belgian and French markets. As of then, Euroclear SA/NV has provided access to these three European markets via the single consolidated ESES platform, which is an integrated settlement platform. All transactions in securities for which the ESES CSDs act as CSD of Reference are settled in real time in central bank money on the ESES platform and, in the event of a settlement versus payment, a true delivery or receipt versus payment (DVP/RVP) is achieved. The introduction of ESES meant that, from an operational point of view, cross-border transactions between the three markets ceased to exist.

With the launch of ESES in January 2009, the central banks of Belgium, France and the Netherlands have outsourced the processing of the cash leg of transactions versus payment to ESES; hence the cash settlement is still executed in central bank money. Both the securities and the cash legs of the securities settlement are processed on the ESES platform. A standing order for a liquidity transfer from the TARGET2 cash account to the ESES cash account is executed at 19:30 to fund the settlements. In addition, participants have the option of transferring additional liquidity to the ESES platform between 07:00 and 16:00. As overnight balances are not permitted in ESES, there is a mandatory sweep to TARGET2 at 16:45. ESES also offers an optional sweep at 07:05, but this is not often used.

Since March 2011, Euroclear SA/NV has concentrated all its settlement activities within a single operational facility, which is located near Paris. From a legal point of view, Euroclear Nederland now outsources the processing of its settlement activities to Euroclear France.

Custody functions

In addition to its role as operator of the securities settlement system, Euroclear Nederland is also the CSD of the Netherlands. The depository is responsible for book-entry transactions and the custody, management and administration of all kinds of securities for its admitted institutions. When banks deposit securities held by their customers with the depository, book-entry positions are created that make it possible to settle securities transactions by book-entry transfer. Since the new Securities Giro and Transfer Act came into force in January 2011, asset protection has applied to securities held by either an admitted institution or an entity that is permitted under Dutch law to offer securities accounts to clients. In the Securities Giro and Transfer Act, such an entity is termed an “intermediary”. This means that investors in those securities are joint owners of the securities in the system and their ownership rights will be unaffected if their bank or the depository goes into receivership. Consequently, there is no counterparty risk in this settlement system.

The introduction of the new Securities Giro and Transfer Act marked the first step towards the dematerialisation of all securities by the end of 2013. To this end, Euroclear Nederland no longer accepts physical securities, other than global notes, for deposit in its vaults within the Netherlands. Further, Dutch issuers of new securities can only issue dematerialised securities registered in the name of Euroclear Nederland or in the form of a global note to be deposited with Euroclear Nederland. All Dutch securities currently held in paper form with Euroclear Nederland must either be converted into global notes or dematerialised before 1 January 2013. As of that date, it will no longer be possible to transfer physical securities, other than global notes, within Euroclear Nederland.

At end-December 2010, Euroclear Nederland was the “CSD of Reference” of almost 14,800 securities. Securities and bonds in custody accounted for a total value of EUR 925 billion.

Links with other SSS

Pursuant to Section 35b of the Securities Giro and Transfer Act, Euroclear Nederland maintains an approved link to the Belgian (I)CSD, Euroclear Bank. Other links are available via Euroclear Belgium and Euroclear France.

4.4 DNB's involvement

DNB is involved in post-trade processing, clearing and settlement as liquidity provider, settlement bank and facilitator of the guarantee model.

Liquidity provider

As the Netherlands are part of the euro area, DNB is bound by the T2 Guidelines issued by the ECB if DNB opts to act as liquidity provider. Consequently, DNB needs the approval of the ECB's Governing Council to grant intraday liquidity to non-banking institutions in the financial infrastructure.

Settlement bank

Since January 2009, DNB has outsourced the settlement bank function for the cash equity and derivatives markets of NYSE Euronext, although settlements are still executed in central bank money. However, DNB continues to perform monitoring activities for participants under its regulatory responsibility.

Facilitator of the guarantee model

In January 2002, the so-called "DNB offer" or "guarantee model" was introduced. Under this model, developed by DNB in collaboration with the Dutch market participants involved, Dutch clearing participants can meet their collateral requirements, both for margin and clearing funds, by a guarantee based on collateral deposited with DNB. This method enhances the security and efficiency of the participants' liquidity and collateral management. At present, only the Dutch clearing participants of LCH.Clearnet make use of this model.

**Payment, clearing and
settlement systems in
Saudi Arabia**

Contents

List of abbreviations	349
Introduction.....	351
1. Institutional aspects	351
1.1 The general institutional framework	351
1.2 The role of the central bank	352
1.3 The role of other private and public sector bodies.....	353
1.3.1 The role of the Capital Market Authority (CMA)	353
1.3.2 Financial intermediaries allowed to provide payment services	354
1.3.3 Other entities	354
2. Payment media used by non-banks.....	354
2.1 Cash payments.....	354
2.2 Non-cash payments.....	354
2.2.1 Non-cash payment instruments	354
3. Payment systems (funds transfer systems).....	357
3.1 General overview.....	357
3.2 Large-value payment system.....	357
3.2.1 SARIE system	357
3.3 Retail payment systems.....	361
3.3.1 ATM and EFTPOS – SPAN	361
ATM transactions.....	362
EFTPOS transactions	362
3.3.2 Cheque clearing	365
3.3.3 EBPP – SADAD.....	367
4. Systems for post-trade processing, clearing and securities settlement	369
4.1 General overview.....	369
4.2 Post-trade processing systems – stock exchange trading and settlement system.....	369
4.2.1 Electronic confirmation system	369
4.3 Securities settlement systems – government securities settlement system.....	371
4.4 Central counterparties and clearing systems	372
4.5 Use of securities infrastructure by the central bank.....	372

List of abbreviations

BTD	Banking Technology Department – the SAMA department that is responsible for the development and operation of a number of payment systems in Saudi Arabia.
CMA	Capital Market Authority – the regulator of all capital markets activities in Saudi Arabia.
GCC	Gulf Cooperation Council, which consists of six countries: Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates (UAE).
IPSS	Integrated Payment Systems Strategy.
Prepaid card	A card on which value is stored or which is linked to an account into which funds have been paid in advance.
SADAD	The electronic bill presentment and payment system of Saudi Arabia.
SAMA	Saudi Arabian Monetary Agency – the central bank of Saudi Arabia.
SAR	Saudi Arabian riyal – the national currency of Saudi Arabia.
SARIE	Saudi Arabian Riyal Interbank Express – the RTGS payment system of Saudi Arabia.
SIMAH	Saudi credit bureau.
SPAN	Saudi Payments Network is the routing switch for cross-bank ATM transactions and all POS transactions in Saudi Arabia.
Sukuk	The Islamic equivalent of bonds. Sukuk certificates are structured to comply with Islamic law and its investment principles.
TADAWUL	The stock exchange system of Saudi Arabia.

Introduction

With the cooperation and support of the commercial banks, the Saudi Arabian Monetary Agency (SAMA) leads the development and day-to-day management of a modern payments infrastructure to support the country's economic development. The major elements of the Saudi payments infrastructure are the RTGS, ATM, EFTPOS and cheque clearing systems as well as an electronic bill presentment and payment system.

Launched in 1997, the Saudi Arabian Riyal Interbank Express (SARIE) system is the RTGS system that underpins the Saudi payments environment. It eliminates interbank settlement risk for all SARIE payments while supporting a wide range of electronic banking products and services. It also provides settlement functions for all other payment systems operating in Saudi Arabia and for the cash legs of equity and bond transactions traded on the TADAWUL stock exchange.

The Saudi Payments Network (SPAN) system handles all cross-bank ATM transactions and all POS transactions. The volume and value of transactions processed over SPAN has grown substantially since its implementation (for ATMs in 1990 and POS in 1993). The expected growth in the use of POS and prepaid cards means that there will be a heavy reliance on SPAN as a robust and central part of the Saudi payment system.

Cheque clearings play a vital role in Saudi payments. While the total value of transactions processed in the 10 SAMA clearing houses fell markedly after the implementation of SARIE, cheque usage in Saudi Arabia is still significant and is likely to continue to play a major role in the Saudi payments landscape over the medium to long term.

The SADAD electronic bill presentment and payment system, developed in 2004, provides a comprehensive and efficient service for the payment of one-off and recurring bills. The number and value of bills paid through SADAD continue to grow. It provides a very important facility for the collection of a variety of both public and private sector bill payments. It is rapidly becoming a vital component of the Saudi payments environment.

Cash payments continue to play a significant role in retail transactions. However, the role of cash payments is expected to diminish substantially in the short to medium term with the introduction of prepaid cards and other planned initiatives.

A number of projects are currently under way to further enhance the national payment infrastructure. An outline of these projects is provided in Section 3.

1. Institutional aspects

1.1 The general institutional framework

The Saudi Arabian Monetary Agency was established by a Royal Decree issued on 4 October 1952 with the objectives of issuing and strengthening the Saudi currency and stabilising its internal and external value, and conducting the banking business of the government. The Capital Market Authority (CMA) was established in 2003 to regulate capital market activity in Saudi Arabia.

The following laws in Saudi Arabia are relevant to payment and settlement systems.

- Royal Decree (1957)

This extended SAMA's objectives to regulating exchange dealers and managing the country's official foreign exchange reserves.

- Currency Law (1959)

This conferred on SAMA the sole privilege of issuing the currency of Saudi Arabia as determined by the Council of Ministers and made it mandatory for SAMA to maintain full cover in gold and convertible foreign currencies for currency issued.

- Anti-Forgery Law (1960)

This law makes it a criminal offence for anyone to counterfeit currencies, financial papers, financial instruments or banking documents. As transactions related to payment cards, share trading, ATMs, EFTPOS etc give rise to banking documents, they are subject to the provisions of this law. Violations are punishable by financial penalties and prison terms.

- Negotiable Instruments Regulations (1963)

This law covers the legal treatment of various payment instruments such as bills of exchange, cheques and drafts.

- Banking Control Law (1966)

SAMA was given broad powers to regulate and supervise Saudi banks and to safeguard the banking system. This law defines the banking business, confers licensing powers, determines capital adequacy, prescribes reserve requirements, grants authority to formulate credit policy and deals with the usual banking supervisory issues. These include conferment of enabling powers to issue rules and guidelines to banks and to lay down conditions for certain actions and transactions. Consequently, the Agency can issue rules and guidelines for any new type of banking transaction or product, including payment cards, ATMs and EFTPOS.

- Anti-Money Laundering Law (2008)

This law provides a statutory basis for criminalising money laundering and the financing of terrorism.

- Electronic Transactions Law (2007)

This law aims at controlling, regulating and providing a legal framework for electronic transactions and signatures.

- Capital Market Law (2003)

The Capital Market Law provides for the establishment of a depository centre that is solely authorised to execute transactions connected with the deposit, transfer, settlement, clearing and registration of ownership of all securities traded on the stock exchange.

1.2 The role of the central bank

SAMA performs a number of important functions. Among other tasks, the Agency:

- issues the national currency, the Saudi riyal;
- acts as a banker to the government;
- supervises commercial banks;
- manages the Kingdom's foreign exchange reserves;
- conducts monetary policy for promoting price and exchange rate stability; and
- promotes the growth and ensures the soundness of the financial system.

In addition, SAMA actively promotes cooperation among financial market participants and acts as a banking ombudsman. SAMA also provides training facilities to the banking community through its Institute of Banking.

SAMA provides non-cash payment services by permitting the banks to maintain current accounts with it through which interbank settlements take place with finality. Transactions in treasury bills, government bonds and repos, and purchases and sales of foreign exchange by the banks also pass through these accounts.

SAMA's role in payment systems has evolved from its broad mandate to maintain the safety and soundness of the Saudi banking and monetary system and to strengthen its credibility. It is by judicious exercise of its regulatory powers that SAMA has led the development of payment systems in the country with the full participation of the banks.

SAMA's leading role in the payment, clearing and settlement systems has been essential to ensure effective execution of a rational and consistent national strategy for payment systems. This approach is based upon a conviction that significant financial benefits will accrue to all financial market participants from a collaborative rather than a competitive approach to the development of a common payment infrastructure.

To implement this payment strategy, SAMA has established a Banking Technology Department (BTD) under the aegis of the Directorate of Banking Control. BTD is responsible for the development, enhancement and day-to-day operation of the payment, clearing and settlement systems in Saudi Arabia and for enlisting the cooperation and participation of the local banks.

SAMA operates a network of 10 regional branches to meet the government's needs to collect and distribute funds and to meet the requirements of local commercial banks for currency and remittances. The regional cheque clearing houses are also operated at each of these branches.

The banked population, meaning the share of the population with bank accounts, has increased significantly over recent years, primarily due to a SAMA initiative to have the entire government payroll paid into bank accounts using the SARIE system. In promoting efficient and convenient means of payment, SAMA is explicitly encouraging the spread of the banking habit in support of Saudi Arabia's social and economic development.

1.3 The role of other private and public sector bodies

1.3.1 The role of the Capital Market Authority (CMA)

The CMA was established by Royal Decree in 2003 to regulate all capital market activity in Saudi Arabia. The CMA's functions are to regulate and develop the Saudi capital market by issuing required rules and regulations for implementing the provisions of the Capital Market Law. The objectives are to create an appropriate investment environment, boost confidence, reinforce the transparency and disclosure standards of all listed companies, and to protect investors and dealers from illegal acts in the market.

The CMA is mandated to:

- regulate and develop the capital market and promote appropriate standards and techniques for all sections and entities involved in securities trade operations;
- protect investors and the public from unfair and unsound practices involving fraud, deceit, cheating, manipulation and insider trading;
- maintain fairness, efficiency and transparency in securities transactions;
- develop appropriate measures to reduce risks pertaining to securities transactions;
- develop, regulate and monitor the issuance of securities and under-trading transactions;
- regulate and monitor the activities of entities working under the CMA; and
- regulate and monitor full disclosure of information related to securities and issuers.

The Saudi Capital Market Law provides for the establishment of the Saudi Stock Exchange as a joint stock company that operates as the only authorised entity for the trading of securities in Saudi Arabia. The exchange operations are currently conducted through TADAWUL, the stock exchange, which is tasked with continuously developing a fully fledged securities market that provides a comprehensive and diverse range of internationally competitive financial services.

1.3.2 Financial intermediaries allowed to provide payment services

There are currently 23 commercial banks in Saudi Arabia with 1,519 branches. Ten of these banks are Saudi banks, the other 13 being branches or offices of foreign banks located in Saudi Arabia. All banks fully participate in the various payment and settlement systems that are currently operational in Saudi Arabia. All banks in Saudi Arabia are members of SWIFT for the purpose of sending and receiving international payment messages.

1.3.3 Other entities

There are 25 moneychangers in Saudi Arabia. These are special purpose financial institutions that are permitted by law to change foreign currencies into local currency and vice versa and to provide limited funds transfer services. The moneychanger institutions have traditionally provided exchange and other elementary banking services mainly to foreign pilgrims to Saudi Arabia's holy places. The moneychangers perform no primary banking functions and are not permitted to participate directly in the payment and settlement systems. They can, however, access such services through a commercial bank.

Other financial institutions include special purpose government credit agencies, insurance companies, specialised investment companies, leasing companies and finance companies. Certain international credit card companies such as MasterCard, Visa and American Express use Saudi banks to offer their products and services to customers in Saudi Arabia. These institutions use the Saudi payment and clearing systems as customers of the local banks.

2. Payment media used by non-banks

2.1 Cash payments

The currency of Saudi Arabia is the Saudi riyal (SAR). SAMA issues bank notes in denominations of SAR 1, 5, 10, 20, 50, 100, 200 and 500 as well as coins in denominations of 1, 5, 10, 20, 25, 50 halalas and SAR 1. The value of banknotes and coin in circulation at the end of 2009 amounted to SAR 99 billion.

Banknotes and coins are distributed through the 10 SAMA branches to the branches of the commercial banks in their respective districts. Besides meeting the cash requirements of commercial banks, SAMA branches pay out and receive cash on behalf of various government agencies.

2.2 Non-cash payments

2.2.1 Non-cash payment instruments

2.2.1.1 Credit transfers

The SARIE system, which commenced operation in 1997, is a fully integrated RTGS system that permits all Saudi banks to make immediate interbank payments over accounts held at

SAMA. All other clearing systems operating in Saudi Arabia are settled over SARIE. The payments processed by SARIE include:

- same-day and forward value payments;
- bulk and single messages;
- customer and bank-to-bank payments;
- direct debits, both single and bulk; and
- most public and private sector payrolls.

In terms of value, interbank credit transfers amounted to SAR 55,543.9 billion in 2010 (compared with 4,870.8 billion a decade earlier). Customer transfers represented only SAR 2,881.7 billion (SAR 374.7 billion in 2000).

Recent developments on SARIE include:

- updating of customer payment messages to the SWIFT MT103 message formats in 2008. At the same time, the ISO standard for IBAN was implemented;
- same-day settlement of banks' positions from TADAWUL was implemented in 2010;
- updating of the system's security features starting in 2008; and
- amendment of the daily business cycle times in 2006 following discussions with all participants and relevant SAMA departments.

See Section 3.2.1.7 for details of major ongoing and future projects related to SARIE.

2.2.1.2 *Direct debit*

Direct debits were launched in Saudi Arabia in 1997 as part of the SARIE System and, by the end of 2010, their total value had increased by 7.5% to SAR 394 million. SAMA instigated a review of direct debiting in 2004 in order to enhance and standardise the scheme's processes. One of the aims of the review was to improve awareness of the product in Saudi Arabia, and the creation of a comprehensive direct debit scheme manual was a specific goal within that process.

This manual is a complete guide to the operation of the direct debit system and governing banks, payers and originators. It describes all aspects related to membership of the direct debit scheme, direct debit indemnity, direct debit mandate and direct debit scheme rules and regulations.

2.2.1.3 *Cheques*

All cheque clearings are operated by SAMA. The main centres are at Riyadh, Jeddah and Dammam, where 88% by volume and 90% by value of all clearing house items are processed. Automated processing and sorting machines are used at these main centres, while the other seven clearing centres process the clearings manually. In 2010, the total number of cheques processed at the SAMA clearing houses was just over 7 million items with a total value of SAR 724.2 billion.

All banks in Saudi are direct participants in the cheque clearings. While cheque usage has greatly decreased since the introduction of the SARIE, SPAN (ATM and POS) and SADAD electronic payment channels, cheques continue to play an important part in the Saudi payments landscape. Some 75% of the cheques issued in Saudi Arabia are processed in-house, ie they are deposited by the payee at a branch of the paying bank and thus are not involved in the interbank clearings.

A project is currently under way to upgrade the processing and sorting machines at the main clearing centres.

2.2.1.4 *Payment cards*

The Saudi Payments Network (SPAN) operated by SAMA processes all POS transactions in Saudi Arabia and also all cross-bank ATM transactions. The ATM service was introduced in 1990 with the POS service being added in 1993. By the end of 2010, the commercial banks had issued more than 12 million eligible and active cards. SPAN processed ATM transactions to the value of SAR 468 billion in 2010 (about 40% of all ATM transactions – the remainder being in-house transactions at the issuing banks' own ATMs) and POS transactions to the value of SAR 72 billion (all POS transactions are processed through the central switch). The average POS transaction was SAR 475.32.

SPAN cards function as both ATM and POS cards. There are almost 10,900 ATM terminals and more than 80,000 POS terminals in Saudi Arabia. There are 16 direct participants in SPAN which operates around the clock. The maximum value of individual payments through SPAN is SAR 20,000. Settlement is handled on a multilateral net basis with final settlement taking place over the SARIE RTGS system.

Growth in SPAN transactions in the medium term, in particular POS, is expected to be quite substantial with the planned introduction of prepaid cards in the near future. Recent developments include:

- the implementation of EMV. All new cards must be EMV-compliant from January 2010 and all existing (magnetic stripe) cards must be replaced by end-2012; and
- implementation of SPAN II in 2009 with all POS devices being migrated to the EMV standard by end-2011.

See Section 3.3.1.7 for information about planned developments for the SPAN system.

2.2.1.5 *Prepaid debit card*

The SPAN prepaid card suite is an account-based product, offering EFTPOS and ATM access. It is designed to bring currently unbanked sectors of the Saudi Arabian population into the banked community.

The prepaid card suite will streamline the card account opening process and reduce operating costs for issuing banks (as compared with a standard bank account). Prepaid debit cards can be issued in various forms and formats that are expected to be attractive to certain significant consumer sectors such as users of:

- payroll/salary cards;
- student bank cards;
- youth sector (starter) bank cards;
- expenses cards for personal or corporate expense purposes; and
- gift cards.

The prepaid cards suite is expected to launch within Saudi Arabia during the first quarter of 2012.

2.2.1.6 *Electronic bill presentment and payment (EBPP)*

Within Saudi Arabia, electronic bill presentment and payment (EBPP) payments are enabled through SADAD. SADAD's core function is to facilitate and expedite payment operations through all banking channels in Saudi Arabia. The system was established to complement the set of initiatives aimed at developing the financial sector as part of SAMA's efforts in building a fully electronic payment infrastructure that is integrated, safe, cost efficient and expandable.

Working with the 14 banks that currently participate directly in SADAD, the 106th biller has recently been linked to the SADAD system. The network's gross number of transactions has grown exponentially over the six years since the system's establishment and it now processes more than 10 million transactions monthly with a value of more than SAR 8 billion.

The most recent major changes took place in mid-2009 when new services were added to the system. These were:

- a real-time fee inquiry and payment facility for government services (eg those of the Ministry of the Interior, which is responsible for traffic violation fines, driving and motor licenses, passports, and alien control); and
- a refund service where the end customer can request a refund of the money through banking channels.

See Section 3.3.3.7 for details of major ongoing and future projects related to SADAD.

3. Payment systems (funds transfer systems)

3.1 General overview

The SARIE system, a vital component of the payments infrastructure in Saudi Arabia, has met all of the objectives that were set out for it in 1997. The RTGS system now provides a vital component of the Saudi payments environment. It has had the effect of eliminating interbank settlement risk for all SARIE payments while at the same time facilitating the development of a wide range of electronic banking systems. It also provides the other payment systems operating in Saudi Arabia with a settlement function. In addition, the cash legs of equity and bond transactions traded on the TADAWUL stock exchange are settled in the SARIE system.

The SPAN system, which handles all cross-bank ATM transactions and all POS transactions in Saudi Arabia, provides a major element of the country's payment infrastructure. The volume and value of transactions processed over SPAN has grown substantially since its implementation for ATMs in 1990 and for POS in 1993. The expected and planned growth in the use of POS and prepaid cards in the short to medium term means that there will be a heavy reliance on SPAN.

Cheque clearings continue to play a vital role in the Saudi payments landscape. While the total value of transactions processed in the 10 SAMA clearings fell markedly after the implementation of SARIE, cheque usage in Saudi Arabia is still quite significant and is likely to remain so over the medium to long term.

Developed in 2004, the SADAD system provides a comprehensive and efficient service for the payment of one-off and recurring bills. The number and value of bills paid through SADAD continue to grow. It provides a very important facility for the collection of a variety of both public and private sector bill payments. The SADAD system has enabled SAMA to respond very quickly to customer demand. It is rapidly becoming a vital component of the Saudi payments environment.

3.2 Large-value payment system

3.2.1 SARIE system

SARIE is Saudi Arabia's RTGS system. Since going live in May 1997, it has linked all banks in Saudi Arabia and provides the mechanism whereby all Saudi commercial banks make and

settle payments in Saudi riyals. SARIE has provided the basis for improved banking products and services and is the foundation for Saudi Arabia's payments system strategy.

Institutional framework

Owned and operated by SAMA, the SARIE system is located at SAMA's head office in Riyadh. Commercial banks communicate with the central system through proprietary gateways over a private network. Most banks have automated payments processing systems linked to these gateways. The SARIE Operating Rules and Regulations (ORR) govern the use and operation of the system. The ORR governs the following:

- ownership and operation of the system;
- admission and expulsion of participants;
- certification of participants by SAMA;
- definition of each payment type and its usage;
- responsibilities of all parties using the SARIE system;
- use of system functions by participants;
- types of system function that are reserved for SAMA use; and
- direct debit scheme rules governing banks, payers and originators.

3.2.1.2 Participation

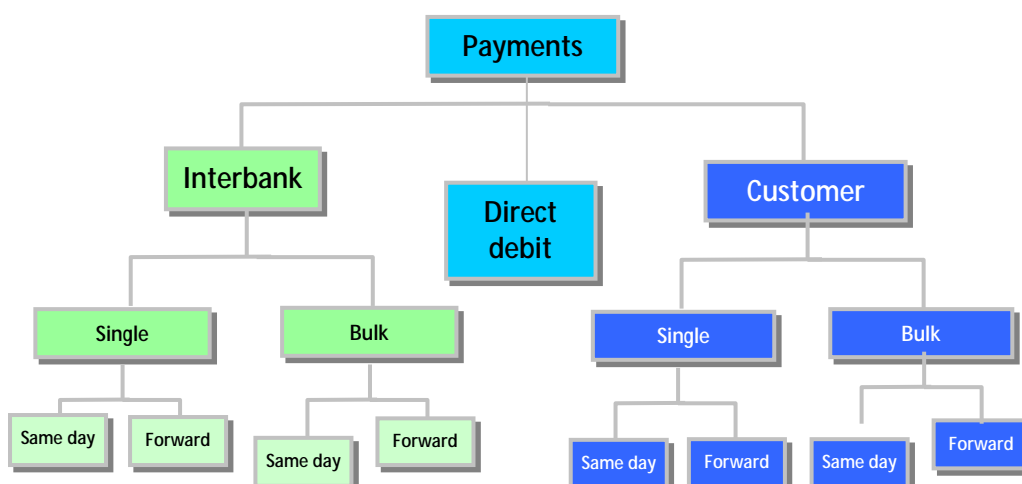
There are now 22 participants in the SARIE System; the 21 commercial banks and SAMA. The SARIE ORR states that all participants must be banks, must have systems, procedures and trained staff that are acceptable to SAMA for participation in SARIE and must be certified by SAMA in accordance with the ORR. There is no requirement in relation to a minimum number of transactions. SAMA must approve all participants. New participants are charged a one-off fee on joining the SARIE system as specified in the SARIE charging policy.

3.2.1.3 Types of transaction

SARIE combines the functionality of both a high-value and a high-volume system and handles both credit transfers and direct debits.

The message types are based on SWIFT standards and were upgraded to MT103 format in 2008. SARIE supports both single and bulk transfers, which may be effected on a same-day value basis or up to 14 days forward value. Banks are provided with a schedule of their position up to 14 days ahead. The system handles interbank and customer payments as well as direct debits and facilitates the execution of domestic transfers arising from the receipt of international funds transfer instructions. The diagram below shows the types of transaction message that are handled by the SARIE system.

Types of transaction



3.2.1.4 Operation of the system and settlement procedures

SARIE is a fully integrated RTGS system that permits all banks within Saudi Arabia to make immediate interbank money transfers through accounts held at SAMA. The system has 24-hour availability and ensures payment finality and irrevocability. SARIE business hours are as follows:

- Saturday to Wednesday 09:00 to 16:00
- Thursday 09:30 to 13:30

Forward value payments and maturing direct debits are settled at the start of the daily business cycle. Same-day value payments are irrevocably settled with finality in real time provided that the sending participant has sufficient liquidity in its account. Payments are queued until sufficient liquidity is available. If sufficient liquidity is not available prior to the close of the operational phase, SAMA may cancel any queued payments. See Section 3.2.1.5 for further information on liquidity.

Participants have real-time, direct access to their accounts with SAMA which enables them to continuously monitor their financial positions. SAMA as central controller has facilities for selective intervention to break payment gridlock situations in exceptional circumstances. The system provides gridlock resolution, or circles processing, tools to allow SAMA to resolve these situations. Payments may also be re-prioritised or cancelled.

The tight linkages to other SAMA head office operating systems permit banks to manage their liquidity for their SARIE accounts via sale and repurchase facilities against their government bond and treasury bill holdings (repos and reverse repos) and purchases and sales of foreign currency through SAMA.

The SARIE system has a number of security features to ensure that it operates smoothly, and in a fully controlled environment. These features include:

- digital signatures;
- encrypted communication lines;
- secure access through use of smart cards;
- physical security at all SARIE sites with access to the system being provided only to authorised personnel; and
- contingency is provided through dual configuration and contingency sites.

SARIE integrates the settlement of all other existing systems, ie ATM, POS, cheque clearings, SADAD and various card payment systems (22 individual clearings). The net positions arising from these individual clearings are further netted and settled in SARIE in a single event. Net interbank positions arising from the TADAWUL stock exchange trading system are settled as a separate event in SARIE.

3.2.1.5 Risk management

The risk management approach designed for SARIE provides a rigorous and comprehensive mechanism for controlling risks. Intraday overdraft limits restrict the system's exposure to any one participant. All limits are fully collateralised. Limit amounts and the nature and value of collateral are decided by SAMA.

SAMA issues a limits and collateral policy to all participants. This sets out the rules governing intraday limits and specifies the types of acceptable collateral. The policy states that participants may negotiate intraday overdraft limits with SAMA and that the intraday overdraft limit must be fully collateralised by Saudi Arabia government-issued instruments that can be readily liquidated and over which SAMA has jurisdiction. The policy then lists the instruments that are acceptable as collateral:

- government development bonds;
- treasury bills;
- special bonds;
- floating rate notes; and
- certain specified Islamic banking instruments.

SAMA holds a letter of undertaking signed by each bank, pledging the specified instruments as collateral.

The balance on a participant's account must never be less than zero plus any intraday debit limit approved by SAMA. All intraday debit balances on a participant's account must be discharged at the end of the day, at which stage the participant's account must be zero or in credit. If any action is required to safeguard the integrity of the banking system, SAMA can adjust these requirements. SARIE also features real-time monitoring of banks' intraday limits by SAMA and the banks, thus improving the system's capability for actively managing institutional and systemic risk.

3.2.1.6 Pricing

SAMA sets fees for the use of the system on a cost recovery basis. Fees are levied on participants under the following headings:

- transaction fees are charged to the sending participant according to the volume of messages and instructions sent by that participant. There are separate fee scales for bulk and single, interbank and customer, same-day and forward value payments and direct debits;
- clearing settlements – fees are charged to the operator of each clearing system based on the number of clearing batches settled;
- service fees are charged to participants who choose to use the optional services provided by the central system; and
- exceptional and penalty fees are intended to encourage best practice to ensure the smooth functioning of the overall system for the benefit of all participants and their customers.

Fee levels are set with the following aims in mind:

- encouraging both participants and their customers to switch from manual to automated procedures;
- responding to and encouraging new developments in various electronic payment systems and methods;
- encouraging participants to provide the fullest possible range of electronic services to their customers, including same-day and forward value payments; and
- encouraging the early transmission of payments so as to mitigate the impact of any contingency situation.

Participants are free to set tariffs for their customers in relation to SARIE transactions on a competitive basis. However, the maximum tariff that may be charged to a customer by a participant in any single SARIE transaction is:

- SAR 15.00 for a forward value transaction; or
- SAR 25.00 for a same-day value transaction.

3.2.1.7 Major ongoing and future projects

Recent changes to the SARIE system include:

- updating of customer payment message formats to the SWIFT MT103 format in 2008;
- implementation of ISO standard for IBAN (ISO 131616) between 2006 and 2008;
- implementation of same-day settlement for TADAWUL stock exchange in 2010;
- upgrading of security features of the system; and
- extension of daily business cycle (operating hours).

Planned projects include the following:

- implementation of intraday batch settlements for positions arising from the TADAWUL stock exchange;
- response to agreed improvements arising from interbank meetings;
- review of and enhancements to the daily business cycle (operating hours) and operating days schedule; and
- upgrades to the system component.

3.3 Retail payment systems

3.3.1 ATM and EFTPOS – SPAN

Payment cards have increased significantly in importance as a retail payment medium in Saudi Arabia. The Saudi Payments Network (SPAN) was introduced in 1990 as an interbank ATM service and enhanced in 1993 to support point of sale (POS) transactions.

At the end of 2009, there were 12.16 million eligible and active cards issued by the commercial banks (one active card per 2.2 head of population) functioning as both ATM and EFTPOS cards.

In the course of 2010, the number of ATM and EFTPOS transactions in Saudi Arabia increased by 14% and 21% respectively. These factors, combined with government and banking initiatives to increase electronic services and transactions, lifted the total value of card transactions to more than SAR 540.2 billion in 2010. This growth is projected to continue over the next five to seven years, with a relative focus on EFTPOS transaction

growth, supplemented by changes to the business model and new payments services on the EFTPOS network.

ATM transactions

Some 10,885 ATM terminals are in online daily operation within the SPAN network. During 2010, more than 1 billion ATM transactions took place for a total value of SAR 468.4 billion. The central SPAN system processes 39% by volume and 47% by value of all ATM cash withdrawals in Saudi Arabia – the remainder being in-house transactions performed at the issuer's own ATMs. On average, SPAN cards are used at ATMs 8.4 times per month for cash withdrawal, account information or supplementary services (bill payment, share-dealing, statement requests etc). The average ATM cash withdrawal value in 2010 was SAR 876 (some 27% less than the 2000 figure of SAR 1,118).

EFTPOS transactions

Some 80,505 point of sale terminals are in operation across Saudi Arabia. There were 151.18 million EFTPOS transactions in 2010 for a total value of SAR 71.86 billion, representing an average purchase of SAR 475.32 per transaction. Transaction volumes have risen steadily since 1996, when 6.8 million transactions took place for a total value of SAR 3.2 billion. The average purchase value in 1996 was SAR 471. Of the 151 million transactions made in 2010, some 85% were SPAN (domestic debit card) transactions, the remainder being international card scheme transactions.

3.3.1.1 Institutional framework

The SPAN Scheme is a SAMA-owned and -operated transaction request authorisation system operated on behalf of its members. The SPAN ATM and POS Operating Rules, Regulations and Procedures issued by SAMA govern the system's use and operation.

3.3.1.2 Participation

SPAN members are issuers and acquirers, duly licensed by SPAN to participate in the scheme. Membership is restricted to appropriately licensed financial institutions, operating within Saudi Arabia and regulated by SAMA (ie banks).

Member banks form part of the overall governance scheme for SPAN and are consulted on the SPAN programme's strategy, structure, service and pricing elements. The SPAN Strategic Program developed through 2010 will restructure the scheme's governance model to provide a clearer contribution methodology for member banks.

SPAN scheme participants include:

- SPAN member banks, which are appropriately licensed banks operating within Saudi Arabia. For either ATM or EFTPOS membership, banks may be either:
 - card issuer banks;
 - card acquirer banks; or
 - both issuers and acquirers.

At the end of 2010, there were 16 card issuer members, 17 ATM acquirer members and 10 POS acquirer members in the SPAN scheme.

- SPAN cardholders participate in the SPAN scheme but are not scheme members. The cardholder relationship is directly with the issuing bank and this relationship is contractually defined in the issuing bank's terms and conditions. At the end of 2010, there were 12.16 million active cards in Saudi Arabia.

- SPAN merchants participate in the SPAN scheme but are not scheme members. The merchant relationship is directly with the acquiring bank and this relationship is contractually defined in the merchant services agreement negotiated between the merchant and its acquiring bank. As at the end of 2010, there were 80,505 registered EFTPOS terminals in operation in Saudi Arabia.
- ATM operators: in Saudi Arabia, all ATM operators are SPAN member banks. ATMs are operated in strict accordance with the SPAN Operating Rules, Regulations and Procedures (the Business Books) and in compliance with the technical standards mandated by SAMA. As at the end of 2010, there were 10,885 registered ATM terminals in operation in Saudi Arabia.

3.3.1.3 *Types of transaction*

SPAN offers interbank ATM reciprocity across Saudi Arabia and with approved international counterparties, specifically within the Gulf Cooperation Council (GCC) countries, so that all customers of GCC-based banks can withdraw cash at any ATM in Saudi Arabia.

This has permitted nationwide ATM service coverage with a relatively modest deployment of ATMs. There are currently 10,885 ATM terminals in online daily operation in SPAN (as at end-2010), processing 89.6 million transactions a month, for a total monthly value of SAR 39.1 billion.

For EFTPOS payments, SPAN operates as a quasi transaction acquirer as all EFTPOS terminals in the Saudi Arabian national network are directly connected to the central SPAN switch. The terminals themselves are installed and maintained by the individual banks, which also maintain the commercial acquiring relationship with the merchants.

SPAN EFTPOS terminals accept SPAN-operated cards within Saudi Arabia and provide a single online connection to the overseas switches of these “other-bank card” associations. SPAN also supports an interchange connection to the central switches in the other GCC countries.

3.3.1.4 *Operation of the system and settlement procedures*

The SPAN scheme is owned and operated by SAMA. The scheme operates a central processing switch which interconnects all ATM and EFTPOS terminals in Saudi Arabia.

For both interbank ATM and all EFTPOS transactions, payments (authorisation) requests are routed through the SPAN central processing switch from the terminal to the card issuing bank. The transaction request is authenticated by the issuing bank and an authorisation response (positive or negative) is returned to the terminal. The transaction is irrevocably and instantaneously completed through the SPAN system.

Interbank settlement for SPAN transactions takes place across the SARIE RTGS system. Interbank settlement occurs in two phases. Initially, a net settlement position is determined by the SPAN scheme for and between member banks on a multilateral basis, for each SPAN and SARIE operating day. The SPAN positions are transmitted to SARIE, where they are consolidated with the positions from other clearings and settled on a net-net basis over the banks' settlement accounts in SARIE.

3.3.1.5 *Risk management*

Risk within the SPAN payments system can be classified into:

- operational risk: as a retail payment system of systemic importance, the SPAN system is subject to a standard business resumption plan (BRP) to ensure round-the-clock availability for payments authorisation. During 2011 and 2012, the SPAN BCP infrastructure will be subject to an end-to-end upgrade, further increasing system resilience and performance levels.

- data security risk: the SPAN operating system incorporates the following security standards:
 - public key encryption (PKI) to support authentication and certification functions with other networks;
 - PIN message authentication code (MAC) used to validate the source and text of a message between sender and receiver;
 - EMV chip standard for end user card technology (mandated for all cards by 2013); and
 - payment card industry (PCI) standards for card and PIN handling.
- settlement risk: net settlement of the respective member bank positions is made with finality on T+1 through the SARIE RTGS system.

3.3.1.6 Pricing

Cardholder transaction fees for both ATM and EFTPOS transactions are set by the issuing bank. Merchant fees for EFTPOS transactions are negotiated between the acquirer and the merchant.

Transaction processing fees for both interbank ATM transactions and EFTPOS transactions are set by SAMA. Issuers are charged a fee for transaction authorisation messages and for settlement. Acquirers pay a fee for settlement only. All fees are discounted by SAMA, based on the volume of transactions undertaken by both the issuer and the acquirer, with the aim of incentivising growth in both the card issuing and merchant acquiring business.

In addition, EFTPOS fees charged by SAMA are offered at a discount to ATM fees, to encourage issuers to incentivise EFTPOS transactions over ATM transactions, supporting the drive to reduce the overall use of cash throughout Saudi Arabia.

Multilateral interchange fees are payable for all interbank card transactions effected within Saudi Arabia. Such interchange fees are payable from the issuer to the acquirer on both interbank ATM transactions and interbank POS transactions, processed through the SPAN payments switch.

All interchange fees are regulated by SAMA through the SPAN scheme management entity. Interchange rates for both ATM and POS transactions are determined by SAMA based on cost assessments undertaken periodically by SAMA. These assessments are based on information sourced by SAMA from a survey of member bank issuing and acquiring costs.

ATM interchange fees, payable by the issuer to the acquirer depend on the nature of the transaction and specifically whether the request is for information or cash withdrawal. POS interchange fees, also payable by the issuer to the acquirer, depend on the transaction value. A higher interchange fee is payable where the transaction value exceeds SAR 100.

SAMA is currently reviewing the cards payments business in Saudi Arabia and, specifically, the interchange model for POS transactions. Any changes will seek to incentivise issuer bank promotion of card activity within Saudi Arabia with a view to reducing reliance on cash transactions.

3.3.1.7 Major ongoing and future projects

The National Payments Strategy (IPSS), developed in 2009, is driven by SAMA's ongoing objectives, which include shrinking the volume of cash employed in Saudi Arabia and supporting new and enhanced electronic banking services for the country's population.

During 2009/10, the SPAN scheme conducted an end-to-end review of the strategic programme for Saudi Arabia's card payments system, directed by the key findings of the

National Payments Strategy (IPSS). Arising from the development of the SPAN Business Strategy, the following key initiatives have been commissioned:

- Infrastructure quality:
 - migration of issued card base from magnetic stripe to EMV standard to be completed by end-2012;
 - migration of the EFTPOS terminal estate to EMV standard by end-2011;
 - systems and technical upgrade of the SPAN central switch. During 2011/12, the SPAN infrastructure will be comprehensively upgraded, further improving system resilience and performance levels; and
 - introduction of revised service and operating level agreements.
- Market expansion/growth:
 - review of the debit card market business model in Saudi Arabia, with a view to supporting growth in cardholder numbers and card usage. Introduction of market regulation to support new payment types (such as prepaid debit cards) within Saudi Arabia. This initiative will encourage growth in the Saudi Arabian banked population (currently 55%) and reduce the extent and use of cash in Saudi Arabia.
 - introduction of market regulation to support new payment types (such as prepaid debit cards) within Saudi Arabia. This initiative will enable growth in the Saudi Arabian banked population (currently 55%) and reduce the extent and use of cash in Saudi Arabia.
- Overall SPAN scheme governance:
 - a revised SPAN scheme governance model has been developed, effective from 2011, to promote cooperation at scheme level with the aim of delivering the scheme objective of becoming “The first payment choice in Saudi Arabia”.

These initiatives are taking place against a background of sustained growth for SPAN.

3.3.2 Cheque clearing

3.3.2.1 Institutional framework

Cheques are cleared at the local clearing houses maintained at each SAMA branch. In 1985–86, SAMA introduced standards for Saudi cheques, including MICR code lines, and reformed procedures for interbank clearing and settlement.

Clearing computers were installed at the three largest SAMA branches, in Riyadh, Jeddah and Dammam, in 1987. The automated clearing service provided by SAMA at these centres is known as the Automated Clearing House (ACH). The ACH accounts for the bulk of cheques cleared in Saudi Arabia in terms of both volume (88%) and value (90%). The remaining cheques are cleared through manual clearings at the other seven SAMA branches.

Settlement of all cheques cleared through the clearing houses, both ACH and manual, is handled through SARIE on a net basis for each separate exchange.

3.3.2.2 Participation

All licensed and SAMA-regulated banks in Saudi Arabia that are members of the SARIE RTGS payments scheme are eligible to issue cheques and participate in the cheque clearings.

3.3.2.3 *Types of transaction*

Two broad categories of cheque are issued within Saudi Arabia:

- Consumer cheques
 - drawn on the account-holder, consumer cheques are subject to settlement finality and can be returned unpaid up to final settlement (typically T+3). Consumer cheques are issued by both personal account-holders and business account-holders.
- Bank cheques/bank drafts
 - drawn on the account of the issuing bank, bank cheques or bank drafts are considered to represent guaranteed funds.

3.3.2.4 *Operation of the system and settlement procedures*

The cheque clearing houses are operated by SAMA at each of its 10 branches throughout Saudi Arabia. There is one clearing cycle per day from Saturday to Thursday with final settlement being done on T+0 in SARIE on a multilateral net basis.

Interbank settlement for cheque clearing transactions takes place across the SARIE RTGS system. Interbank settlement occurs in two phases. Initially, a net settlement position is determined by the each of the 10 clearing houses for and between banks on a multilateral basis. The cheque clearing positions are transmitted to SARIE, where they are consolidated with the positions from other clearings and settled on a net-net basis over the banks' settlement accounts in SARIE.

3.3.2.5 *Risk management*

Although small in volume, accounting for 7 million interbank cheques in 2010, the cheque clearing remains an important retail payment system. Operational resilience and business continuity are backed by ample reserves of processing capacity both within and between the three ACH centres in Jeddah, Riyadh and Dammam. In the case of the manual clearing houses, the clearing can be conducted at one of the other clearing houses.

The cheque payments system incorporates the following security standards:

- cheque printing standards are mandated by SAMA;
- word values and numerical values are checked/reconciled above defined value thresholds; and
- signatures on cheques are validated against the signature mandate held by the issuing bank.

3.3.2.6 *Pricing*

Approximately three out of every four cheques presented in Saudi Arabia are payable to a payee with a bank account at the drawee bank and are therefore not subject to the interbank clearing system.

In 2010, approximately 7 million cheques issued in Saudi Arabia were processed through the interbank cheque clearing system. These cheques were subject to a SAR 1.00 processing fee, levied by SAMA. Typically, issuing banks absorb this cost, without passing it directly to the customer.

3.3.2.7 *Major ongoing and future projects*

An end-to-end business review of the cheque as a payment instrument and its positioning within the Saudi payments system was undertaken through the IPSS in 2008/9. As part of

this review it was decided that the cheque, as a physical, paper payment instrument, would not form part of the future strategic payments growth path in Saudi Arabia.

Nonetheless, a major cheque clearing infrastructure upgrade was undertaken during 2011. The ACH infrastructure was renewed, including upgrades for process resilience in the interbank cheque clearing. A project is under way to upgrade the processing and sorting machines at the main clearing centres.

3.3.3 EBPP – SADAD¹

Electronic bill presentment and payment (EBPP) is the core service provided by SADAD. SADAD was a much-needed system, as a rising volume of new products and services – buoyed by a growing population and a more open economy – meant that payments needed to be conducted faster and more efficiently. Against this background, SADAD's growth strategy is driven by three primary aims:

1. to provide a fundamental payment infrastructure for electronic transactions, bill presentment and collection to support the whole economy (all billers, payers and banks);
2. to adhere to the regulatory role of SAMA by remaining independent from all stakeholders and not prioritising one over the other, as well as by continuing the Agency's efforts to create a less cash-dependent economy; and
3. to maintain a value-added relationship with all stakeholders based on an efficient and viable business model.

SADAD has the ISO 9001 (Quality Management System) and ISO 27001 (Security Management System) certifications. It aims to continuously improve its e-payment solutions and deliver future initiatives that best serve Saudi Arabia's macro economy.

3.3.3.1 Institutional framework

SADAD is owned and operated by SAMA.

3.3.3.2 Participation

Some 14 licensed banks operating in Saudi Arabia are active direct members. There were more than 100 billers as at the end of 2010. Billers are from both the public and private sectors. There are about 6 million active end user customers.

Billers represent a wide variety of industries, including telecoms, insurance, credit cards and loans, utilities, press and media, airlines, and government entities including ministries, municipalities, customs, funds, initiatives and projects. The expansion of SADAD's services will further broaden the range of potential users.

3.3.3.3 Types of transaction

SADAD lets billers present their invoices through the banking channels so that customers can pay electronically in real time. This process begins when the biller presents for payment an e-bill that may be either recurring, such as those for mobile and fixline telephone services, or a one-off pre-defined bill, such as the invoice for an airline ticket. This so-called Postpaid service is the first of SADAD's current range of four services.

¹ SADAD has received many awards for its role in supporting the national economy including the United Nations Public Service Award in 2008, the GCC E-Government Award in 2009 and the Injaz e-Government Achievement Award in 2010.

The second service is Prepaid, which lets billers upload their customers' account numbers to SADAD so that the customers can pay any desired amount, eg for recharging mobile phones. The third service is the eVoucher technology, which works in a similar way to prepaid scratch cards, with the difference being that customers download eVouchers from SADAD's wide range of electronic channels.

The fourth service is fee inquiry and payment for government services. Customers can request a refund of their money up to the point where they use the relevant service.

3.3.3.4 Operation of the system and settlement procedures

SADAD offers its services through all available banking channels, including ATMs, telephone and internet banking, and bank branches. The following processing steps are involved:

1. billers send summary bill information to SADAD on pre-determined schedules;
2. SADAD validates data received and uploads it into its database;
3. SADAD notifies billers of any discrepancies;
4. customer requests bill(s) information through bank channels;
5. the bank forwards the request received to SADAD;
6. SADAD retrieves bill information from its database and forwards it to the customer via the bank;
7. customer selects the bill(s) to be paid and the respective amount(s);
8. the bank debits the customer's account and confirms the transaction;
9. SADAD updates its database based on the bank's confirmation;
10. SADAD notifies relevant biller(s) accordingly;
11. at the end of day, SADAD initiates settlement of interbank positions through SARIE;
12. also at the end of day, billers receive reconciliation reports from SADAD showing a breakdown of all transactions processed by SADAD; and
13. SADAD updates the bill's status to settled.

3.3.3.5 Risk management

Since SADAD does not deal directly with the end customer, consumers are authenticated by their banks using the usual authentication mechanisms via the various banking channels. SADAD, on the other hand, must authenticate banks and billers. This is done via security certificates that are obtained from the biller's Saudi bank. Each certificate has an expiration date that must be renewed by the biller. Only billers with valid certificates can gain access to the secure SADAD portal, and to ensure maximum security, SADAD will only accept questions or complaints from employees of billers or banks whose names are registered on the profile for each biller that is known as the Master Data Capture (MDC), a record of details such as the selected service type and solution. This information is available only to SADAD employees.

3.3.3.6 Pricing

Fees are charged only to billers, who are discouraged from passing them on to their customers. Fees are set on a per biller basis based on the nature of the biller's industry, projected volumes, average value of each bill, and projected penetration.

3.3.3.7 Major ongoing and future projects

SADAD plans to significantly expand its population of billers by establishing new services such as an internet payment gateway where shoppers can pay online at the merchant's web

site. Payment solutions for small or medium enterprises (SMEs) that require little or no system integration are also planned. This will support SADAD's aim of reaching out to all levels of society by developing an advanced B2B system to the same standards as the current B2C and G2C approaches.

The following additional changes are planned:

- enhancements, planned for mid-2011, to bill and payment processing performance, which will help to increase system throughput;
- re-engineering the system with a service-oriented architecture to reduce time to market for new services and initiatives;
- expansion of the biller base to cover a wider market of SMEs;
- introduction of an online payment engine for e-commerce;
- development of B2B e-invoicing platforms with design and implementation scheduled over the next three years; and
- e-invoicing automated and integrated presentment and payment options for detailed invoices between invoicer and payer.

4. Systems for post-trade processing, clearing and securities settlement

4.1 General overview

SAMA manages the clearing and settlement of government securities, including government development bonds (GDBs), floating rate notes (FRNs) and treasury bills (T-bills). The stock exchange company (TADAWUL) operates the stock exchange and the Securities Depository Center (SDC). TADAWUL is the only entity authorised to conduct the trading of private securities, whether equities or bonds.

4.2 Post-trade processing systems – stock exchange trading and settlement system

4.2.1 Electronic confirmation system

The Equator system, provided and supported by NASDAQ OMX, is used to match and confirm trades.

4.2.1.1 Institutional framework

The Capital Market Authority (CMA), Saudi Arabia's securities regulator, is empowered to oversee and regulate securities settlement. In 1984, a Ministerial Committee was formed to regulate and develop the market. SAMA was the government body charged with regulating and monitoring market activities until the CMA was established in July 2003 under the Capital Market Law (CML) by Royal Decree M/30. The CMA is now the sole regulator and supervisor of the capital market, it issues the required rules and regulations to protect investors and ensure fairness and efficiency in the market. The CMA conducts regular inspections of the CSD and engages in constant dialogue with TADAWUL and market players.

TADAWUL is a joint stock company with an independent board of directors appointed by a decree of the Council of Ministers, consisting of representatives of the Ministry of Finance,

Ministry of Commerce and Industry, SAMA and representatives from the members of the stock exchange (brokers) and listed companies.

TADAWUL commenced operations in 2001 and was formally approved in March 2007 in accordance with the Capital Market Law. TADAWUL was established to develop a fully fledged securities market that provides comprehensive and diverse financial services.

TADAWUL also operates a Securities Depository Center (SDC). The Capital Market Law provides for the establishment of the SDC, which is solely authorised to conduct the deposit, transfer, settlement, clearing and ownership registration of securities traded on the exchange.

4.2.1.2 Participation

Commercial banks, broker-dealers and other financial institutions are direct participants in the SDC. In all there are 97 market participants, of which 65 provide services as dealers.

There is no guarantee fund. Brokers provide a letter of guarantee from their bank and are required to obtain cash from the purchaser prior to a trade. However, there are no guarantees in respect of the clearing bank because there is a pre-validation system for both inventory and cash.

4.2.1.3 Types of asset classes

TADAWUL handles the following types of securities:

Type	Listings etc
Equity	146
Listed bonds and sukuk	7
Bonds and sukuk (OTC)	9
Exchange-traded funds (ETFs)	2
Total	164

4.2.1.4 Operation of the system

TADAWUL has four main areas of business, which are integrated to provide listing, trading, market data and the functions of a central securities depository (CSD).

Buyers and sellers submit orders via their respective brokers in the market. Brokers enter prices for their clients into an electronic trading system. The trading system is linked to the CSD, which facilitates the online movement of securities between accounts of the counterparties. The matched deals are transferred electronically to the settlement system in real time. The trading system then checks the availability of the securities being sold in the client's holding. If the holding is sufficient, the order is executed. Clients are required to pre-fund their securities/cash accounts when the order is entered into the trading system. Once orders are matched, trades are generated and reported electronically to the CSD, with the immediate transfer of shares from the seller's account to the buyer's account. This occurs via the depository system, which has the authority to directly and immediately update the share books of the companies.

Clearing banks set the broker's daily settlement cap at no later than 10:00 on each trading day. Once set, the settlement cap cannot be exceeded, although it can be updated by the clearing bank at any time during the day. The settlement cap is known as the Daily Settlement Limit (DSL). Clients are required to fund their cash accounts when their order is entered. The funds are blocked by the corresponding buying broker, and are then transferred

to the broker's omnibus account once the broker receives the trade notification. The net cash positions of brokers are updated in real time upon execution of any buy or sell order.

At the end of the trading day, at 15:30 Saturday to Wednesday, the depository system calculates the net position of each bank in respect of their broker clients and transmits these interbank positions to SARIE for settlement. Final settlement of the interbank positions takes place in SARIE by 15:40 each day. The depository system operates on a DVP2 basis, as equities are settled on a gross basis and cash is settled on a net basis at T+0. Bonds and sukuk are settled and cleared on T+2. Each broker is required to have a commercial clearing bank that will stand as guarantor for them. These banks provide brokers with a trading limit that may not be exceeded. TADAWUL monitors the credit limits given to the banks' clients. The depository system has a program to monitor the brokers' exposure by tracking settled transactions and uncommitted trades against the value of the limits provided by each commercial bank. If the system identifies a transaction that will take a broker over its limit, it is automatically rejected.

More than 90% of negotiable securities in Saudi Arabia are immobilised and dematerialised in the CSD. The CSD handles both equities and bonds, and is used to facilitate transfer of ownership arising from secondary market transactions. Beneficial owners are identified at the individual level in the CSD.

4.2.1.5 Risk management

The requirement that securities and cash are prefunded prior to the trade, together with the blocking of securities by the CSD and the provision of a bank guarantee for the broker, provides some safeguards against default. However, there are no guarantees against a default by the clearing bank extending the guarantee. In case of a broker default, the clearing bank has the obligation to close the broker position. There are no guarantee funds or investor protection funds that address the risk that a clearing bank might default. There is a minimum capital requirement of SAR 50 million for trading participants.

4.2.1.6 Pricing

Commission fees are charged on each trade and are calculated as follows:

1. the maximum commission is 0.12% of the trade value;
2. the minimum commission imposed is SAR 12.00 for any executed order of SAR 10,000 or less; and
3. authorised persons (brokers) may agree with their customers to apply a lower commission. This discount has to be agreed and documented in advance and records must be maintained for all discounts.

4.2.1.7 Major ongoing and future projects

No major projects are currently under way.

4.3 Securities settlement systems – government securities settlement system

SAMA manages the clearing and settlement of government securities (GDBs, FRNs and T-bills).

4.3.1.1 Institutional framework

SAMA is the regulator of the government securities market. SAMA provides the custodian service for all government securities.

4.3.1.2 Participation

All commercial banks participate in the government securities market. The banks act as investors, distribution agents, secondary market-makers and subcustodians.

4.3.1.3 Types of asset class

- See Section 4.3 above.

4.3.1.4 Operation of the system

SAMA operates a registry with securities accounts for banks investing in government securities such as GDBs, T-bills and FRNs. Both primary and secondary market transactions are settled at SAMA against the current accounts of the commercial banks processing the transaction, and the corresponding transfers are recorded in the securities accounts of the relevant investors. T-bill auctions are executed for banks and government agencies (mainly pensions funds) with prices set by SAMA. Auctions of GDBs to banks are based on competitive bidding. Transactions in the primary market are settled in SARIE on a T+2 basis. Secondary market transactions between banks are executed by sending trade confirmations between the buyer and the seller. Copies of the trade confirmations are sent to SAMA by both banks, where they are matched and ownership is transferred. Interbank payments via SARIE are used to transfer the funds between the two banks.

4.3.1.5 Cash-leg settlement process

The cash leg of all government securities trades is settled on a gross basis in the SARIE system.

4.3.1.6 Custody function

The custody function for government securities is provided by SAMA. Commercial banks offer a subcustodian service.

4.3.1.7 Major ongoing and future projects

There are currently no major projects under way.

4.4 Central counterparties and clearing systems

Not applicable.

4.5 Use of securities infrastructure by the central bank

The SARIE Limits & Collateral Policy sets out the rules governing intraday overdraft limits for the SARIE system. The policy states that the intraday overdraft limit must be fully collateralised by Saudi government-issued instruments that can be readily liquidated and over which SAMA has jurisdiction. Banks can also access liquidity via sale and repos and reverse repos offered by SAMA.

From a regulatory perspective, the banks' holdings in government securities are considered eligible for domestic liquidity ratio purposes.

**Payment, clearing and
settlement systems in
South Africa**

Contents

List of abbreviations	377
Introduction.....	379
1. Institutional aspects	379
1.1 The general institutional framework	379
1.2 The role of the central bank	379
1.2.1 Oversight.....	380
1.2.2 Provision of payment and settlement services	380
1.2.3 Cooperation with other institutions.....	380
1.3 The role of other private and public sector bodies.....	381
1.3.1 Banks	381
1.3.2 Payments Association of South Africa	381
1.3.3 Payment Clearing House (PCH) system operators	381
2. Payment media used by non-banks	382
2.1 Cash payments.....	382
2.2 Non-cash payments.....	382
2.2.1 Non-cash payment instruments	382
2.2.2 Non-cash payment terminals	385
2.2.3 Interchange fee regulation	386
3. Payment systems	386
3.1 General overview.....	386
3.2 Participation.....	386
3.3 Types of transactions.....	387
3.4 Operation of the system and settlement procedures	387
3.5 Risk management.....	387
3.6 Pricing	388
3.7 Major ongoing and future projects.....	388
4. Systems for post-trade processing, clearing and securities settlement	389
4.1 General overview.....	389
4.2 Securities settlement systems	390
4.2.1 Institutional framework.....	390
4.2.2 Participation.....	390
4.2.3 Types of transactions	390
4.2.4 Operation of the system.....	390
4.2.5 Risk management.....	391
4.2.6 Links to other systems.....	392

4.2.7 Pricing	392
4.2.8 Major ongoing and future projects.....	393
4.3 Use of securities infrastructure by the central bank.....	393

List of abbreviations

ATM	automated teller machine
BIS	Bank for International Settlements
BSD	Banking Supervision Department
CLS	Continuous Linked Settlement
CPSS	Committee on Payment and Settlement Systems
CSD	central securities depository
DVP	delivery versus payment
EFT	electronic funds transfer
EFTPOS	electronic funds transfer at the point of sale
FSB	Financial Services Board
IOSCO	International Organization of Securities Commissions
JSE	Johannesburg Stock Exchange (JSE Ltd)
NPS	national payment system
NPS Act	National Payment System Act, 1998 (Act No 78 of 1998)
PASA	Payments Association of South Africa
PCH	Payment Clearing House
RTC	Real Time Clearing
RTGS	real-time gross settlement
SAFIRES	South African Financial Instruments Real-Time Electronic Settlement
SAFE	SAFIRES Front End
SAMOS	South African Multiple Option Settlement
SARB	South African Reserve Bank
SARB Act	South African Reserve Bank Act, 1989 (Act No 90 of 1989)
SFIDVP	simultaneous, final and irrevocable delivery versus payment
SSD	self-service device
SST	self-service terminal
SWIFT	Society for Worldwide Interbank Financial Telecommunication
ZAR	South African rand

Introduction

South Africa, like many African countries, has varying requirements for payment systems and payment instruments. In urban areas, sophisticated first-world electronic facilities and instruments are demanded, while in remote rural areas, the predominant requirement is cash-based. This is reflected in the physical payment system infrastructure implemented throughout the country.

Over the past few decades, the South African national payment system (NPS) has developed steadily. In 1998, the South African Reserve Bank (SARB) introduced a more sophisticated settlement system called South African Multiple Option Settlement (SAMOS).

SAMOS, designed for large-value interbank transactions, was developed to bring domestic interbank settlement practices in line with international best practice and signalled the start of a new era for payment practices in South Africa.

1. Institutional aspects

1.1 The general institutional framework

The role and responsibilities of the SARB in the domestic payment system are governed by the South African Reserve Bank Act, 1989 (Act No 90 of 1989 – the SARB Act). The SARB is empowered to “perform such functions, implement such rules and procedures and, in general, take such steps as may be necessary to establish, conduct, monitor, regulate and supervise payment, clearing and settlement systems”.

The SARB ensures the overall effectiveness and integrity of the NPS and has thus been given the power to govern the entire payment process, from the moment that the payer initiates a payment until the beneficiary receives the money.

The SARB, together with the banking industry, drafted legislation for the participants in the NPS, and in October 1998 the National Payment System Act, 1998 (Act No 78 of 1998 – the NPS Act) was promulgated. The purpose of the NPS Act is to “provide for the management, administration, operation, regulation and supervision of the payment, clearing and settlement systems in the Republic of South Africa, and to provide for connected matters”.

The SARB oversees the safety and efficiency of the payment system pursuant to the NPS Act. In terms of regulation, the SARB may issue directives and position papers. Directives contain binding rules to address payment system risks, while position papers contain guidelines to address payment system risks and foster sound practices within the payment system.

1.2 The role of the central bank

One of the roles of the SARB is to provide banking services to the central government, although this function has been scaled down since the government began holding cash balances with other banks. The SARB does not provide banking services to provincial governments, local authorities or state enterprises.

The SARB is, however, responsible for the movement of government balances to, from and between other banks. Such movements have an effect on banks’ cash holdings and therefore serve as a convenient additional instrument for managing banks’ liquidity.

As part of its role as “banker to banks”, the SARB acts as custodian of the cash reserves that banks are legally required to hold or prefer to hold voluntarily with the SARB. The SARB has the authority to change banks’ minimum cash reserve requirements and can use such adjustments to influence bank liquidity and the amount of money in circulation.

The SARB provides liquidity to banks during periods of temporary shortages of cash, ie it acts as “lender of last resort”.

The SARB also provides banks with liquidity by lending against reserved collateral to facilitate the funding of settlement instructions in SAMOS.

1.2.1 Oversight

The intensity of oversight is proportionate to the systemic or system-wide risks posed by a payment system. The South African oversight model has been aligned, developed and refined to cater for the domestic payment system, and at the same time adheres to international best practice.

The scope of the South African oversight function includes banks and non-bank participants. Developments in the area of payment products, notably innovations such as mobile banking and electronic money, are also carefully monitored. Oversight thus keeps track of both traditional providers of payment products in the South African market and newcomers.

Through continuous monitoring, performance statistics, risk management reports and specific compliance requirements, participants are monitored and analysed for exceptions or problems.

1.2.2 Provision of payment and settlement services

The only assets used to settle interbank obligations by payment system participants are central bank money in the form of either cash or the passing of entries across the books of the SARB. The SAMOS system is a subset of the general ledger of the SARB and any entries passed are final and irrevocable under the NPS Act.

SAMOS has a high degree of security, operational reliability and contingency arrangements in place. Security policies include the security and network architecture. The security solutions are maintained and upgraded as the technology changes and international, national and industry standards are raised.

On the operational level, service levels and the accompanying service level agreements are matched to the changes required.

SAMOS is the only settlement system in South Africa and is owned and operated by the SARB.

1.2.3 Cooperation with other institutions

The SARB is a member of various committees at the Bank for International Settlements (BIS), including the Committee on Payment and Settlement Systems (CPSS). The SARB is represented in numerous BIS working groups.

The SARB also has formal relationships with and participates in various projects and initiatives with other international institutions, such as the World Bank and the International Monetary Fund.

There has been ongoing cooperation and interaction with the Continuous Linked Settlement (CLS) Bank since the inclusion of the South African rand (ZAR) in the CLS system.

Close cooperation is maintained with the Banking Supervision Department (BSD) of the SARB as payments are primarily made from funds on deposit.

1.3 The role of other private and public sector bodies

1.3.1 Banks

Banks issue various payment instruments to their customers to effect transactions including, among other things, financial market transactions as well as day-to-day purchases of goods and services.

Banks' business customers do not have direct access to the clearing and settlement networks and therefore have to utilise the payment networks of participating banks.

Systems and communication mechanisms are put in place by commercial banks to provide their customers with payment facilities and channels, including automated teller machines (ATMs), internet banking facilities, branch networks and payment instruments. The banking industry has been encouraged to develop payment instruments and systems that include electronic funds transfer (EFT) mechanisms, debit orders, debit cards and credit cards.

Commercial banks respond to their customers' requirements by providing robust, fit-for-purpose payment instruments that adhere to international best practice. Innovation, access, security and safety are important features taken into account in developing payment instruments.

1.3.2 Payments Association of South Africa

Under the NPS Act, the SARB may recognise a payment system management body established with the object of organising, managing and regulating the participation of its members in the payment system. The Payments Association of South Africa (PASA) is recognised by the SARB in this regard.

PASA manages the conduct of its members in all matters relating to payment instructions. One of the main responsibilities of PASA is to support the SARB in its role as overseer of the payment system by ensuring compliance by its members and, where necessary, imposing penalties and sanctions.

1.3.3 Payment Clearing House (PCH) system operators

The PCH system operators are BankservAfrica, Strate Limited, Visa and MasterCard.

1.3.3.1 BankservAfrica

BankservAfrica is the system operator responsible for clearing interbank obligations stemming from the retail payments environment.

BankservAfrica is owned by the South African clearing and settlement banks, and provides interbank electronic transaction switching services to the banking sector. Retail payment transactions include EFTs, cheques, and card, internet and ATM transactions.

Payment instructions arising from retail transactions are sent to BankservAfrica through the various payment streams and networks for clearing. At BankservAfrica the payment instructions are sorted and the interbank obligations of the participants calculated. At predetermined times, the interbank obligations are submitted to SAMOS for settlement. No multilateral netting takes place within the clearing system or within SAMOS.

1.3.3.2 Strate Limited

Strate Limited (Strate) is responsible for the settlement of securities in South Africa. Equities, bonds and money market instruments are bought and sold through the stock exchange or in direct transactions between buyers and sellers. Strate then determines the interbank payment obligations arising from these transactions, which are then settled in SAMOS.

1.3.3.3 Visa and MasterCard

Cards issued by South African banks are affiliated to international payment schemes such as Visa and MasterCard. Depending on card issuer preferences as well as the nature of the transactions, these transactions are cleared and settled by the relevant payment schemes.

2. Payment media used by non-banks

2.1 Cash payments

The SARB has the sole right to produce, issue and destroy banknotes and coins in South Africa. The SA Mint Company and the SA Bank Note Company, both subsidiaries of the SARB, are responsible for the minting of coins and printing of banknotes, respectively.

There are five denominations of notes (R10, R20, R50, R100 and R200) and seven denominations of coin (5c, 10c, 20c, 50c, R1, R2 and R5) currently in circulation.

Notes and coin in circulation in South Africa as at the end of December 2006 and December 2010 amounted to R63.6 billion and R82.5 billion, respectively.

The demand for banknotes and coin is determined by the general public. Banknotes are used and accepted as a means of payment because the public trusts that they will in turn be able to purchase goods and services to the face value of the banknotes.

The potential supply of banknotes and coin to the public, however, is limited by banks to the extent that the public is only permitted to withdraw cash held as deposits or draw cash against prearranged credit facilities. The SARB is responsible for the wholesale distribution of banknotes and coin, whereas banks distribute banknotes and coin to their branch offices to ensure availability to the public.

Although it is difficult to estimate the value of cash payments, a recent study of consumer spending at major retail institutions in South Africa indicated that cash is still the most prevalent means of payment, accounting for 55% of all transactions by value (88% by volume).

2.2 Non-cash payments

2.2.1 Non-cash payment instruments

Various non-cash payment instruments are issued by banks to enable transactions such as the purchase of goods and services, transfer of funds, etc.

All transactions emanating from the use of these instruments (retail transactions) are cleared at BankservAfrica and settled in SAMOS.

Outlined below are some of the payment instruments used within the South African payment industry.

2.2.1.1 EFT credit

EFT credit transactions originate when a customer instructs their bank via various channels, eg electronic file generation, internet, mobile phone, etc, to make an electronic payment to a third party, accepting that such payment will be made that day or on a future date. Payment is only effected once the customer has been authenticated by the bank and sufficient funds are available.

Subsequent to routing of the payment instructions to the relevant banks, the gross interbank obligations resulting from the cleared transactions are calculated and communicated to the SARB for settlement by the participating banks.

EFT credit payments are widely used by employers to pay salaries and are increasingly being used by retail customers in place of cheques.

The risk emanating from EFT credit transactions is lower since the transactions are “credit-push” in nature, ie the payer initiates the payment.

EFT credits are the most commonly used payment instruments in South Africa and have increased substantially over the years. EFT credits comprise approximately 70% of all retail payments settled in SAMOS.

The value of EFT credit transactions settled in SAMOS increased from approximately R3 trillion in 2006 to R4.8 trillion in 2010, or by 58%.

Real Time Clearing (RTC)

When utilising internet banking, customers have the option to expedite payments by selecting the RTC payment stream instead of the standard EFT credit. This payment stream was developed to provide increased transaction speed and convenience to customers. Once the customer is verified, and funds permitting, the transfer is effected, the payment instruction is immediately processed and the payee credited within 60 seconds.

The RTC payment option was introduced in 2007. The value of RTC payments settled in SAMOS in 2010 amounted to R38.7 billion.

2.2.1.2 EFT debit

EFT debits are used to collect monthly premiums on insurance policies, mortgage and hire purchase payments, medical aid subscriptions, etc. They provide the payer with a cheap and very convenient means of making recurring payments.

EFT debits provide a facility whereby a beneficiary can collect money from a payer’s bank account provided that they have been given either a written or recorded voice mandate to do so.

The value of EFT debit transactions settled in SAMOS in 2006 amounted to R322 billion and increased by 78% to R574 billion in 2010.

2.2.1.3 Cheques

The current view in South Africa regarding cheques is that they are outdated, expensive to process and vulnerable to fraud. Electronic payments are viewed as safer, technologically more advanced and more cost-effective.

However, there would appear to be a number of companies that still prefer to pay by cheque, because the delay in clearing allows for cash float management, and the cleared and processed cheques present irrefutable proof of payment.

It is thus very difficult for a client-centric business like banking to summarily stop providing cheques as a payment instrument. The challenge will be for the industry to wean its remaining cheque-using customers off cheques by persuading them to use the alternatives.

The value of cheques settled in SAMOS in 2006 was close to R1.4 trillion and decreased by 39% to R838 billion in 2010.

2.2.1.4 Cards

Cards are the fastest-growing global non-cash payment instrument, and in recent years have been pivotal to the growth of retail financial services. As a means of payment, cards are the primary alternative to cash and cheques, offering convenience for consumers and merchants alike, making the payment system more efficient and secure.

South African banks offer Visa, MasterCard and/or American Express branded credit cards, which can be used in ATMs and are widely accepted in retail establishments. However, the rules governing participation in Visa and MasterCard schemes are established by their respective international bodies.

The value of card transactions (both debit and credit) settled in SAMOS in 2006 amounted to R150 billion and more than doubled to R303.6 billion in 2010.

Debit cards

Debit cards are issued against a demand deposit account, such as a current or savings account. Thus usage of the debit card is restricted to funds held in the particular bank account.

Similar to a debit card, a cheque card is issued against funds held by the customer in a banking account.

The uptake of debit cards in South Africa has been substantial. From December 2006 to December 2010, the settlement of debit card transactions in SAMOS increased by 173%.

Credit cards

A credit card is essentially a payment instrument through which purchases can be made utilising credit provided by the issuing bank. During the recent financial crisis, growth in the credit card industry has been slow in South Africa, due to high interest rates, shrinking credit limits and more stringent borrowing terms.

Prepaid cards

Prepaid cards are issued against a preloaded balance and distributed mostly by retailers as gift cards.

At the end of December 2010, South African banks had issued approximately 4 million prepaid cards. Many consumers prefer prepaid cards simply because they have more control over their spending. Many industries in South Africa, such as the mining industry, load salaries, loans and commissions onto a prepaid card. The prepaid card is safe, secure and cost-effective, and alleviates the need to carry cash around.

Petrol cards

Petrol cards are unique to South Africa and Namibia and were developed as a result of local fuel regulations. Until recently customers could only use cash or a petrol card to purchase petrol at filling stations. Customers can now also use debit or credit cards at selected filling stations.

2.2.1.5 E-money

The regulation of e-money products and schemes is constantly being developed and applied appropriately as innovation occurs.

In South Africa, only locally registered banks may issue e-money. The money is stored electronically and is a generally accepted means of payment.

Under the Banks Act, deposits of e-money must be held in a separately identifiable e-money account for each holder of e-money. The onus is on the issuer of the e-money to ensure that all relevant legislation is adhered to.

Any person wishing to issue e-money must ensure that the public using the e-money are made aware of the conditions of use and the recourse that the holder of the e-money would have in relation to the issuer.

2.2.1.6 *Mobile banking*

Various initiatives for mobile banking have been undertaken in South Africa recently. Users can access their banking account via their mobile phone, eg for balance enquiries, payments, funds transfers, airtime purchase, etc.

At the end of December 2010, banks reported that 5.4 million customers conduct their banking activities via their mobile phone (for R14 billion in terms of value).

In emerging and developing economies,¹ such as South Africa, millions of people have no access to bank accounts but are nevertheless mobile-phone literate. Banks have identified this lucrative market and the mobile phone has become a vital enabler to provide basic financial services, bridging the gap between the banked and the unbanked population of South Africa.

South Africa has countless breadwinners who live and work in urban economic hubs, but have extended families back home in poorer rural areas, where the building of banking infrastructure does not make business sense. Banks have introduced mobile banking products that allow such breadwinners to send money back home in a safe, simple and affordable manner. The mobile money transfer service means people no longer have to risk giving an envelope full of cash to a middleman, such as a friend or a taxi driver, to deliver to a recipient in a remote area.

Mobile money transfer systems allow a customer to initiate a payment instruction to a beneficiary who does not have a bank account but owns a mobile phone. The beneficiary, once alerted of the transfer, may collect the funds from selected collection points or ATMs using their mobile phone. Banks partner with local retailers to reach communities in some of the most remote parts of the country. One of the main advantages of the service is that the mobile banking technology works across all the networks on any handset or SIM card.

2.2.2 *Non-cash payment terminals*

2.2.2.1 *Automated teller machines (ATMs)*

ATMs of the various commercial banks are distributed throughout South Africa and are used extensively to effect numerous banking transactions, eg cash withdrawals, acceptance of deposits, bill payments, funds transfers, balance enquiries, etc.

The ATM infrastructure is provided by the respective banks, whose brands are displayed on the ATM. Customers may use ATMs of other banks than their own and are charged a service fee for such transactions.

Mini-ATMs, also known as self-service devices (SSDs) offer limited functionality compared to ATMs. Instead of dispensing cash, a mini-ATM issues a paper voucher that may be encashed or used for the purchase of goods at a specific merchant. Mini-ATMs are deployed in rural areas where there is limited or no access to ATMs and are situated in selected merchant stores.

Self-service terminals (SSTs) are devices with the same electronic features and functions as those of an ATM, except that they do not dispense cash.

At the end of 2010 there were 23,259 ATMs, 3,385 mini-ATMs and 1,562 SSTs in South Africa.

¹ <http://www.imf.org/external/pubs/ft/weo/2011/01/weodata/groups.htm>.

2.2.2.2 Terminals for electronic funds transfer at the point of sale (EFTPOS)

EFTPOS terminals are located at participating retail institutions to enable consumers to purchase goods and services using either their debit or credit cards. Consumers are also able to withdraw cash at the merchant's EFTPOS terminal.

The infrastructure for the terminals is in most instances provided by the merchant's bank. However, some retail institutions contract with external companies to provide the necessary infrastructure. As at the end of 2010 there were 273,798 bank-owned EFTPOS terminals in South Africa.

2.2.3 Interchange fee regulation

The regulation of interchange fees has become a contentious issue in many countries, South Africa being no exception.

Recently, an enquiry was launched into the fee structure of the South African banking sector by the local Competition Commission. The enquiry focused on the high bank charges and the lack of transparency thereof, emanating from the market concentration of the four big banks in South Africa. Interchange fees and the regulation thereof formed part of the enquiry.

Although the SARB does not regulate interchange fees, it is proposed that the SARB play the role of facilitator (and not price regulator) in the interchange fee determination process. It is imperative that the parameters considered for price determination be transparent and reasonable, and that the relevant stakeholders, ie both banks and non-banks, be part of the process.

3. Payment systems

3.1 General overview

As highlighted previously, South Africa has only one national payment settlement system, SAMOS. The SAMOS system is an automated interbank settlement system provided by the SARB for banks to settle their interbank obligations on a real-time gross basis, or under a delayed gross settlement arrangement.

SAMOS is used for the settlement of all large-value, retail and securities transactions.

The SAMOS system is linked to the various participant banks, clearing systems and operators.

3.2 Participation

Different tiers of banks or participants function within the payment system. There are currently 23 participants in the SAMOS system.

According to the NPS Act, the following institutions are permitted to be participants in SAMOS and to use the system for settlement purposes:

- the SARB;
- commercial banks or branches of foreign institutions registered under the Banks Act, 1990;
- mutual banks registered under the Mutual Banks Act, 1993;
- cooperative banks registered under the Co-operative Banks Act, 2007; and

- designated settlement system operators such as CLS Bank International, which operates the CLS system.

Banks which are not participants in SAMOS may, however, use sponsorship arrangements through other qualifying banks to clear and settle on their behalf.

3.3 Types of transactions

Large-value interbank transactions are settled one by one on a real-time gross settlement (RTGS) basis. Settlement is final and irrevocable.

Low-value retail payments such as EFT, card, ATM and cheque transactions are settled in batches on a deferred basis.

Settlement of equity, bond and money market obligations also takes place on a batch settlement basis, at predetermined times throughout the business day.

In terms of the settlement value in the overall settlement system, on average, large-value payments represent 92% of the value of the transactions settled and retail transactions 8%. However, the volume of transactions in the retail network far exceeds that of transactions in the large-value settlement system.

The total value settled through the SAMOS system in 2006 and 2010 amounted to R59.3 trillion and R75.6 trillion, respectively, representing an increase of 27%. The total number of transactions processed in the same periods was 1.9 million and 3.3 million, respectively, which means an increase of 76%.

3.4 Operation of the system and settlement procedures

SAMOS operates round the clock, seven days a week. The settlement day starts at one second after midnight and closes at midnight. The settlement cycle is divided into different windows which dictate the types of instructions allowed and accommodates specific processing at predetermined times within the settlement day.

Each SAMOS participant has a settlement account, from which interbank settlement obligations are settled, and a loan account in SAMOS.

Participants must lodge the prescribed collateral (comprising the liquid asset requirements prescribed by the Banks Act, 1990) at the SARB. This collateral is registered in SAMOS and is used to secure intraday loans and to provide sufficient liquidity to ensure the smooth functioning of the settlement system.

SAMOS messages are based on the Society for Worldwide Interbank Financial Telecommunication (SWIFT) standards and message types. All SAMOS participants must be registered at SWIFT and use a SWIFT BIC-8 code. Each participant has a unique number which identifies it to other users of the system.

In order to guard against a possible failure of SAMOS, all instructions are mirrored to the SARB's backup site. This site is a fully functional office with full-time business support personnel. Each settlement member has its own contingency arrangements to address the possibility of an internal systems failure during the day. These may take a variety of forms, to suit the individual participant, and remain the responsibility of the individual member.

3.5 Risk management

Upon the implementation of SAMOS, it was determined that certain retail payment systems were being used incorrectly for large-value payments, thus creating excessive exposures in

those systems. These exposures posed a risk to the entire payment system. To address this, item limits were introduced for specific payment instruments in the retail payment system.

In addition to reducing settlement risk, the implementation of item limits increased the value of payments settled on an immediate finality basis in SAMOS, to more than 90%. The retail payment systems were therefore, reduced to less than 10% of the total settlement value.

A further risk reduction measure taken by the SARB was to move to settlement on the value day and to discontinue the practice whereby batches were settled as per the previous business day. All transactions submitted for the day are settled by that night. Same-day settlement reduces risk as overnight exposures are eliminated.

SAMOS provides facilities for interbank payments to be settled on a real-time basis, that is, finally and irrevocably across the books of the SARB. Settlement risk is thus significantly reduced and principal risk is non-existent.

The SAMOS system settles on a pre-funded (credit-push) basis. When the necessary funds are available, settlement takes place immediately. If a bank has insufficient funds available in its settlement account, the SAMOS system will automatically grant a loan to the bank against acceptable collateral and settlement will then take place immediately. However, when there are neither sufficient funds nor sufficient collateral for a loan, settlement will not take place.

SAMOS is also used to settle the repurchase agreement (repo) transactions that are conducted for monetary policy purposes. Banks can obtain central bank funds via repos. The movement of funds resulting from repo transactions is effected through the SAMOS system in real time. The real-time capability of the settlement system ensures the effective and rapid transmission of monetary policy signals through the financial system, and paves the way for more dynamic interbank and money markets. To limit operational risk, participants are required to have sufficient business continuity planning and disaster recovery facilities in place and to test them regularly.

3.6 Pricing

Charges levied for the use of the SAMOS system are based on cost recovery and include processing and network usage. An account management fee is also charged annually.

Penalties are levied for uncertified and invalid messages, as well as for attempting to effect settlement without sufficient funds.

All charges are transparent to the participants.

3.7 Major ongoing and future projects

The SAMOS system was developed and implemented over 10 years ago. Originally developed as an RTGS system, it has since evolved into a hybrid system to accommodate liquidity optimisation mechanisms to facilitate bond and equity settlements. However, the hybrid evolution of the system and its functionality has been in line with worldwide trends, best practice and standards.

A review of the SAMOS application and settlement network infrastructure in 2009 determined that the system still met the needs of the settlement stakeholders and was viable for the long term.

With the evolution of technology, minor enhancements to the system are ongoing.

4. Systems for post-trade processing, clearing and securities settlement

4.1 General overview

The only exchange for trading securities in South Africa is the Johannesburg Stock Exchange (JSE Ltd). The JSE is licensed as an exchange under the Securities Services Act, 2004 (Act No 36 of 2004) and is Africa’s premier exchange. The JSE has evolved from a traditional floor-based equities trading market to a modern securities exchange providing fully electronic trading, clearing and settlement in equities, financial and agricultural derivatives and other associated instruments and has extensive surveillance capabilities.

Strate, the South African central securities depository (CSD), is responsible for the settlement of a number of securities including equities and bonds for the JSE, as well as a range of derivative products such as warrants, exchange-traded funds, retail notes and tracker funds. The settlement of money market securities has also recently been added to its portfolio of services.

In September 1997, a team of banks and JSE representatives evaluated systems that would suit South African requirements. It was concluded that the Swiss system was the right system for South Africa, as Switzerland was one of the few countries at that stage to comply with the G30 recommendations and in particular to achieve true simultaneous, final and irrevocable delivery versus payment (SFIDVP). The successful implementation of the South African Financial Instruments Real-Time Electronic Settlement (SAFIRES) system by Strate in 1999 marked the beginning of a new era in South African settlement.

SAFIRES and its corresponding front-end system, SAFIRES Front End (SAFE), have made the transition from a paper-based to an electronic-based environment possible.

There is currently no central counterparty in place for equities or money market instruments although, through its specific functioning, the JSE does provide for an underlying guarantee in respect of on-market transactions.

The following diagram depicts the structures post-trade.

Market	Asset class	Trading platform	Clearing	Settlement	
				Securities	Cash
Equities	Equities	JSE	JSE and CSD	CSD (simultaneous, final & irrevocable delivery vs payment)	SARB (central bank funds via RTGS system)
Bonds	Government and corporate debt instruments	JSE	CSD	CSD (simultaneous, final & irrevocable delivery vs payment)	SARB (central bank funds via RTGS system)
Money market	Government and corporate debt instruments (short-term)	Not exchange-traded	CSD	CSD (simultaneous, final & irrevocable delivery vs payment)	SARB (central bank funds via RTGS system)

4.2 Securities settlement systems

4.2.1 Institutional framework

Strate is a limited liability company jointly owned by the JSE, four domestic banks and one international bank. It operates as a depository and settlement system under the Securities Services Act.

Strate's Board of Directors has the power to change depository services and strategy, amend fee structures, and approve, restrict or even withdraw the use of services for participants. The directors' responsibilities are clearly set out in the Securities Services Act and include the self-regulation of Strate, its participants and anyone using the services of the depository, either directly or indirectly.

CSD Rules, Directives and Notices are issued by Strate as part of its legal statute, wherein the rights and obligations of participants are designated. These are binding on the CSD, CSD participants and any other person using the services of a CSD participant.

Section 39 of the Securities Services Act and Rule 3.10 of the CSD Rules provide specifically for the suspension of a participant.

The Financial Services Board (FSB), the regulatory authority for South Africa's non-banking financial services industry, retains the overall responsibility for the licensing of the CSD (Strate). Various other co-regulatory relationships also exist. A formal licence review is undertaken annually by the FSB.

4.2.2 Participation

Strate has established and maintains risk-based qualifying criteria that govern the admission and ongoing suitability of participants. Participants are obliged to apply independently for permission to fulfil this role in each of the equity, bond and money market environments.

Strate is the appointed regulator of the activities of each participant. Strate Supervision, an independent division within Strate, is responsible for ongoing monitoring to ensure adherence to the established criteria. In fulfilling this function Strate Supervision is accountable to the FSB and is required to work with the external auditors of the CSD participants to obtain assurances that they operate in compliance with the CSD Rules and Directives.

As Strate does not hold a banking licence, all clearing and settlement services for cash must take place through a clearing bank that holds a SAMOS account at the SARB and is a registered member of the appropriate PCH.

4.2.3 Types of transactions

Strate has established appropriate systems, in conjunction with the various market participants, to give effect to clearing, settlement and electronic safekeeping of listed and unlisted company equities, warrants and fixed income securities (government, utility and corporate bonds) as well as money market instruments in South Africa.

Detailed procedures for, and operational timelines applicable to, each instrument type have been agreed and are governed by directives published by Strate from time to time. Strate Supervision, as indicated earlier, monitors adherence to these and retains the power to impose operational fines and/or penalties for non-adherence.

4.2.4 Operation of the system

The securities settlement systems operated in South Africa by Strate are all benchmarked against the 19 CPSS-IOSCO recommendations for securities settlement systems published in November 2001. These are continually revisited in line with international best practice. All

markets operate on the principle of SFIDVP, with settlement taking place in central bank funds via a direct interface to the SARB's RTGS system, SAMOS.

Settlement timelines do, however, differ according to instrument type and can vary from T+0 (in respect of money market instruments and certain allowable same day transaction types) to T+5 (in respect of ordinary on-market equities settlements).

BIS settlement models 1, 2 and 3 are employed, again according to instrument type.

Finality, by law, of both cash and securities is achieved upon settlement in the respective systems of Strate and the SARB. Transactions cannot be unwound once settled and bankruptcy cannot be declared on a participant retrospectively (the so-called "zero hour rule" therefore does not apply).

The funds processing cycle makes use of multilateral netting to enhance efficiency in the CSD systems (apart from the money market system, which employs gross trade-by-trade methodologies). The net interbank obligation of the participating banks is calculated by the SAFIRES systems, and the transactions are submitted for settlement in SAMOS at specific times of the day. Once confirmation of settlement is received from the SARB, Strate then initiates the movement of securities (transfer of ownership).

4.2.5 Risk management

Effective risk management and operational efficiency are cornerstones of the CSD model employed by the South African financial markets.

4.2.5.1 Liquidity risk

Liquidity risk is reduced through net cash and securities positions within intraday settlement "windows" for equities and bonds. Any risk exposure is also mediated by small but maturing equities and bond lending/repo markets, and the availability of commercial credit lines. Fails management for equities and warrants is provided by the JSE standing behind all transactions concluded on the Exchange. The JSE does not act as a central counterparty, but its Settlement Authority will step in and settle a failing guaranteed transaction in which a broker was involved. Firstly, however, the JSE member as the introducing party would be called upon by the JSE to settle this transaction by reversing it onto its own book.

Fails management for bond transactions comes through the buy-in procedures which enable participants to access the very liquid repo markets to resolve trade issues. Only when all avenues to alleviate a failing trade have been exhausted (in essence a participant would then be in liquidation default) will the default mechanisms of the JSE be activated. To date no instances of liquidation default have been recorded and no claims have been made against the Bonds Guarantee Fund. The current exchange control regulations restrict the granting of overdraft facilities to any non-resident of South Africa (person or entity). Specific (and timely) requests for such a facility must be submitted to the aforementioned authorities via a commercial bank.

4.2.5.2 Counterparty risk

For equities and warrants, the JSE Settlement Authority guarantees settlement of on-market trades against the default of a member. Risk control methods used include DVP settlement, which guards against the loss of principal, voluntary and compulsory give-ups by the JSE, and ultimately the use of the JSE Guarantee Fund to compensate direct losses as a result of a member default (but without guaranteeing settlement to counterparties of the defaulted broker). Counterparty risk for off-market trades is controlled only by the use of the DVP principle, with no settlement guarantees employed. These transactions constitute only a small minority of the settlement volume passing through Strate.

Participants of the depository's bond settlement service are limited to the major South African banks, hence risk of a participant default is low. Should such a default occur, however, the SARB has undertaken to manage the situation to protect against contagion and has, as part of its overall management approach, developed a comprehensive strategy for dealing with such an event.

4.2.5.3 Asset servicing risk

Strate's primary role is that of information consolidator, collating information received from its participants before passing this on to the issuer (or its agent). The market works according to strict deadlines (as published in Strate Directives) and, following the implementation of the Equities Corporate Actions Enhancement Project in April 2010, processes are largely automated. Very little, if any, manual intervention is required.

4.2.5.4 Financial risk

Possible claims against the depository are limited, by law, to instances of gross negligence only. Strate assumes no credit risk for transactions processed by its participants and only undertakes to distribute the proceeds of corporate/capital events once these have been received from the relevant issuer company.

4.2.5.5 Operational risk

Operational controls and procedures are defined and have been audited by major audit companies in recent years. These reports have not highlighted any material weaknesses, and the controls evaluated across the organisation have been considered adequate, appropriate and effective to provide reasonable assurance that risks are being managed and that objectives should be met. There have been no material breakdowns in controls or losses incurred due to operational breakdowns since Strate's inception.

4.2.5.6 CSD-on-CSD credit risk

Strate successfully connected to the Link Up Capital Markets infrastructure in November 2010. The implementation of actual linkages to another CSD is, however, still dependent upon changes to legislation. Although the new Companies Act has been promulgated, enabling changes are still required. These should be accommodated in the Financial Services Bill that is expected to replace the Securities Services Act during 2012.

4.2.6 Links to other systems

As mentioned above, Strate does not currently have links in place to any other settlement system, although it has recently become a member of the Link Up Capital Markets group.

The intention is to forge appropriate links to (one or more) prominent European CSDs in support of existing and future investment requirements.

4.2.7 Pricing

Strate pricing is published on its website and is considered transparent to users.

Prior to the presentation of proposed pricing to the Strate Board of Directors for approval, the relevant market stakeholders are consulted. Thus, all stakeholders have an opportunity to comment on proposed fees prior to their implementation. Although the stakeholders may not always agree with the pricing, the process remains transparent.

The bulk of the Strate charges levied in the various markets are transaction-based and dependent upon successful completion of individual transactions for a fee to be generated. Specific charging structures differ for each market (equities, bonds and/or money market securities).

4.2.8 Major ongoing and future projects

As mentioned above, one of the key focuses at this time is the implementation of the first CSD-to-CSD linkages.

Strate also continues to invest in the improvement of the technology and functionality used to support its various markets. The Money Market development programme is ongoing and the introduction of the necessary functionality to support category 3 instruments was achieved successfully in August 2011.

Strate, in consultation with the JSE and the various role players, is also actively involved in an assessment regarding the redevelopment of the bonds settlement application.

4.3 Use of securities infrastructure by the central bank

Monetary policy decisions are implemented by the SARB's Financial Markets Department through a range of refinancing operations conducted with the commercial banks as counterparties and which are executed at or with a spread to the repo (policy) rate. In addition to the refinancing operations, the department also conducts a range of open market operations to influence liquidity in the money market. Market operations are undertaken in both the domestic and foreign exchange markets.

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

Contents

List of abbreviations	399
Introduction.....	401
1. Institutional aspects	401
1.1 The general institutional framework	401
1.1.1 Regulatory institutions	401
1.1.2 The legal framework for payment and settlement systems	402
1.2 The role of the CBRT	404
1.2.1 Payment systems oversight.....	404
1.2.2 Provision of payment and settlement services	404
1.2.3 Cooperation with other institutions.....	406
1.3 The role of other private and public sector bodies.....	406
1.3.1 Financial intermediaries.....	406
1.3.2 Istanbul Stock Exchange (ISE)	407
1.3.3 ISE Settlement and Custody Bank, Inc (Takasbank)	408
1.3.4 Central Registry Agency.....	408
1.3.5 Banks Association of Turkey	409
1.3.6 Participation Banks Association of Turkey	409
2. Payment media used by non-banks.....	410
2.1 Cash payments.....	410
2.2 Non-cash payments.....	410
2.2.1 Non-cash payment instruments	410
2.2.2 Non-cash payment terminals	414
2.2.3 Recent developments.....	414
3. Payment systems (funds transfer systems).....	414
3.1 General overview.....	414
3.2 Large-value payment systems	415
3.2.1 The real-time gross settlement system: TIC-RTGS.....	415
3.3 Retail payment systems.....	420
3.3.1 Interbank Card Centre (BKM)	420
3.3.2 Interbank Clearing Houses Centre (BTOM)	423
4. Systems for post-trade processing, clearing and securities settlement	424
4.1 General overview.....	424
4.2 Central counterparties	424
4.2.1 ISE Settlement and Custody Bank (Takasbank)	424
4.3 Securities settlement systems (SSS) and clearing systems	426

4.3.1	CBRT securities settlement system (TIC-ESTS).....	426
4.3.2	ISE Settlement and Custody Bank (Takasbank)	428
4.3.3	Central Registry Agency (CRA)	433
4.4	Use of securities infrastructure by the CBRT	435
4.4.1	Open market operations	435
4.4.2	Securities lending and borrowing market in the CBRT	435

List of abbreviations

BAT	Banks Association of Turkey
BKM	Interbank Card Centre
BRSA	Banking Regulation and Supervision Agency
BTOM	Interbank Clearing Houses Centre
CBRT	Central Bank of the Republic of Turkey
CMB	Capital Markets Board of Turkey
CRA	Central Registration Agency
CSD	central securities depository
DDNs	Domestic Debt Notes (government bonds and treasury bills)
DVP	delivery versus payment
FOP	free of payment
ISE	Istanbul Stock Exchange
KEOS	Public Electronic Payment System
OPYS	Joint POS Management System
POS	point of sale
RC	relay computer (front-end processor for connecting to TIC-RTGS and ESTS)
SDIF	Savings Deposits Insurance Fund
TCA	Turkish Competition Authority
TCS	Takasbank Clearing System
TETS	Takasbank Electronic Transfer System
TIC-ESTS	Turkish Interbank Clearing – Electronic Securities Transfer and Settlement System
TIC-RTGS	Turkish Interbank Clearing – Real-Time Gross Settlement System
TKBB	Participation Banks Association of Turkey
TRL	Turkish lira (national currency unit before 1 January 2005)
TRY	Turkish lira (national currency unit since 1 January 2005)
TurkDEX	Turkish Derivatives Exchange
Ykr	krus (sub-unit of the national currency, one 100th of the Turkish lira)

Introduction

Structural reforms implemented since the Turkish crisis¹ in 2001 and the political stability achieved after 2002 have brought about a significant improvement in fundamental indicators. The major steps towards ensuring macroeconomic and financial stability have included central bank independence, the shift to a floating exchange rate regime and the establishment of a robust supervisory framework to reinforce the soundness of the financial system. Turkey has not only managed to maintain both price and financial stability but it has also avoided a lengthy recession. Unlike many of its peers, the Turkish financial sector maintained its resilience throughout the recent global financial crisis² and required no capital support from the public sector.

The Turkish payment, clearing and settlement framework consists of various electronic systems that cover large-value payments, stock exchange payments, cheque clearing and credit card payments. The Turkish real-time gross settlement (TIC-RTGS) system is owned, operated, regulated and overseen by the Central Bank of the Republic of Turkey (CBRT). It settles interbank payments in Turkish liras and is integrated with the electronic securities transfer and settlement systems (TIC-ESTS). The issuance, real-time transfer and settlement in book-entry form of government bonds and treasury bills (DDNs) and other securities issued by governmental organisations are performed by the TIC-ESTS. Istanbul Stock Exchange (ISE) trades are settled and cleared by the ISE Settlement and Custody Bank (Takasbank).³ Takasbank is also the central counterparty clearing house (CCP) for derivatives transactions traded at the Turkish Derivatives Exchange (TurkDEX). The Central Registration Agency (CRA) is the central securities depository for dematerialised capital market instruments trading on ISE markets. Within the retail payment sector, the Interbank Card Centre (BKM) and Interbank Clearing Houses Centre (BTOM) are the systemically important payment systems. BKM carries out interbank clearing and settlement of card payments, whereas the BTOM handles cheque clearing.

The CBRT has a strong interest in promoting safety and improving efficiency in payment systems as part of its overall concern with financial stability and has played a leading role in the modernisation of payment services. TIC-RTGS has become an efficient funds transfer system and hence an indispensable component of the financial system.

1. Institutional aspects

1.1 The general institutional framework

1.1.1 *Regulatory institutions*

In Turkey, there are three major regulators with respect to payment systems, and securities clearing and settlement systems:

- The CBRT is responsible for securing the objectives of price stability and financial system stability. It is also responsible for the operation, regulation and oversight of

¹ The 2001 financial crisis was caused mainly by an exchange rate crisis that later evolved into a banking crisis.

² The new financial architecture is designed to protect financial and economic stability and bolster the economy against the type of external fluctuations seen in 2008–09.

³ Takasbank is a non-deposit-taking sector-specific investment bank.

payment systems in Turkey. The details of the CBRT's role are described in Section 1.2.

- The Banking Regulation and Supervision Agency (BRSA), which was established under the Banks Law (Law No 4389 enacted in 1999; repealed by the Banking Law, Law No 5411 enacted in 2005), issues licences, and regulates and supervises all major financial institutions, including banks, financial holding companies, and leasing, factoring and consumer finance companies. The BRSA also ensures that independent external auditing firms and rating agencies offering services to financial institutions act in accordance with the principles and methods they set up.

The BRSA aims to safeguard the rights and benefits of depositors and to create the proper environment in which banks can operate with market discipline in a healthy, efficient and globally competitive manner, thus contributing to the achievement of long-run economic growth and national stability.

- The Capital Markets Board of Turkey (CMB) is the regulatory and supervisory authority in charge of securities markets in Turkey. Authorised by the Capital Markets Law (Law No 2499 enacted in 1981), the CMB is responsible for regulating and supervising securities markets and institutions, determining the operational principles of capital markets, and protecting the rights and interests of investors.

In this framework, the CMB regulates and supervises corporations offering securities to the public, securities market intermediaries, securities investment funds (mutual funds), investment companies (including real estate investment companies and venture capital investment companies), independent external auditing firms offering services to capital market institutions, stock exchanges and secondary markets in general, precious metal exchanges and derivatives exchanges, and other related institutions operating on the capital markets, such as ratings agencies, as well as clearing and depository institutions.

The regulation of capital market instruments, including futures and options, also falls under the CMB's regulatory scope. In this framework, it also assumes responsibility for introducing and developing new instruments.

Based on the overall objectives of ensuring the fair and orderly functioning of the markets and protecting the rights of investors, the major goal of the CMB is to take any necessary measures to foster the development of capital markets, hence contributing to the efficient allocation of financial resources while ensuring investor protection.

1.1.2 The legal framework for payment and settlement systems

Although there are no laws dealing specifically with payment and settlement systems, a number of laws and secondary legislation have a bearing on payment-related activities and institutions:

- The Law on the Central Bank of the Republic of Turkey (CBRT Law) (Law No 1211 enacted in 1970; last amended by Law No 6111 enacted in 2011) regulates the operations of the CBRT, whose major functions and responsibilities derive from this law – inter alia the exclusive right to issue banknotes in Turkey. The law authorises the CBRT to establish payment, securities transfer and settlement systems, to enact regulations to ensure the uninterrupted operation and oversight of existing or future systems, and to determine the methods and instruments, including the electronic environment for payments.
- The Banking Law (Law No 5411 enacted in 2005; last amended by Law No 6111 enacted in 2011) regulates the business activities of all banks in Turkey, namely deposit banks, participation banks and development and investment banks, and

Turkish branches of foreign institutions. The law lays down rules and procedures governing the incorporation, management, transactions, transfer, merger, liquidation and supervision of banks, acceptance of deposits and participation funds, in order to protect the rights and interests of depositors. Its purpose is also to ensure the efficient functioning of the credit system by giving due consideration to confidence and stability in financial markets. All activities of financial holding companies, the Banks Association of Turkey (BAT), the Participation Banks Association of Turkey (TKBB), the Banking Regulation and Supervision Agency (BRSA) and the Savings Deposits Insurance Fund (SDIF) are also governed by the provisions of this law.

- Article 79 of the Banking Law makes it obligatory for all deposit, development and investment banks subject to this law to become a member of the BAT, and for all participation banks to become a member of the TKBB, within one month of receipt of their operating licence.
- The Capital Markets Law (Law No 2499 enacted in 1981; last amended by Law No 6111 enacted in 2011) regulates and controls the secure, transparent and stable functioning of the capital markets and protects the rights and interests of investors, for the purpose of ensuring efficient and widespread participation by the public in the development of the economy through investment of savings in the securities market. Capital market instruments and their public offering and sale, exchange markets and other markets organised pursuant to the law, capital market activities, capital market institutions and the CMB are subject to the provisions of the law. The law focuses on shares offered to the public and does not apply to the issuance of shares not offered to the public by joint stock corporations that are not publicly held.
- The Cheque Law (Law No 5941 enacted in 2009) governs all aspects of payment by cheque and provides the framework for issuance, acceptance and payment of cheques. Article 8 governs the establishment and functioning of the interbank clearing houses. Under the CBRT Law, the CBRT is responsible for their oversight and supervision. The rules and procedures of the BTOM are governed according to the regulations issued by the CBRT.
- The Bank Cards and Credit Cards Law (Law No 5464 enacted in 2006; last amended by Law No 6111 enacted in 2011) aims to ensure the efficient functioning of card-based payment systems by establishing rules and procedures governing the issuance, usage and clearing of bank and credit cards. The law also governs the issuance and revocation of operating licences, the obligations of card issuers, and the penalties and obligations of card bearers.
- The Public Finance and Debt Management Law (Law No 4749 enacted in 2002; last amended by Law No 6001 enacted in 2010) establishes rules and procedures for domestic and foreign public debt management. Article 6 paragraph 4 of the law authorises the Undersecretariat of the Treasury and the CBRT to regulate the issuance of government bonds and treasury bills in book-entry form. All securities transfers under this law are registered with the Electronic Securities Transfer and Settlement System (TIC-ESTS), which is the securities settlement system of the CBRT. The final settlement of the related payments is provided by the national real-time gross settlement system (TIC-RTGS).
- The Turkish Commercial Code (Law No 6102 enacted in 2011) defines in Articles 645–849 the form and usage of negotiable instruments, namely promissory notes, bills and cheques, which are used widely for commercial payments.
- The rules and procedures governing participation in TIC-RTGS and TIC-ESTS are governed by a special agreement between the CBRT and participating banks. The banks sign a participation contract with the CBRT agreeing to comply with the

provisions of the TIC-RTGS and the Operational Rules of the ESTS. These rules define the relationship between the CBRT and the participating banks and between the participants concerning the services provided by TIC-RTGS and TIC-ESTS. In particular, they specify the roles of the various parties involved in the system. The operational procedures, rights, obligations and a clause stipulating arbitration as a means of dispute resolution are also governed by these rules.

1.2 The role of the CBRT

The CBRT was established in 1930 under the Central Bank Law (Law No 1715). In 1970, the *Law on the Central Bank of the Republic of Turkey (CBRT Law)* (Law No 1211) was enacted and considerable amendments were introduced in 2001.

Ensuring the smooth functioning of the payment, clearing and settlement systems is among the CBRT's fundamental duties as set out by the 2001 amendments. The CBRT is also involved in the payment, clearing and settlement systems in many different ways.

1.2.1 Payment systems oversight

According to the CBRT Law, the CBRT is responsible for the oversight of payment systems in Turkey. The law stipulates the fundamental duties and powers of the central bank, including:

“... to regulate the volume and circulation of the Turkish lira, to establish payment, securities transfer and settlement systems, to enact regulations to ensure the uninterrupted operation and oversight of the existing or future systems, and to determine the methods and instruments, including the electronic environment for payments.”⁴

The CBRT has disclosed its major objectives and policies concerning payment systems to the public both on its website and in its publications.⁵ As an oversight authority, the CBRT's primary focus is on systemic risk, and its oversight function is concentrated on the TIC-RTGS and BTOM (see Sections 3.2.1 and 3.3.2).

The CBRT conducts its oversight of the BTOM, which is a systemically important payment system, by monitoring, assessing, and fostering change.

With respect to TIC-RTGS, the CBRT uses various instruments in the performance of its oversight function: issuance of regulations, moral suasion vis-à-vis the participants, direct provision of payment services (as the owner and operator of the system) and application of sanctions (as described in the TIC-RTGS and ESTS Operational Rules).

In line with the development of the payment system oversight concept, the CBRT has recently made efforts to restructure and formalise its payment system oversight role.

1.2.2 Provision of payment and settlement services

The CBRT is the owner, operator and overseer of TIC-RTGS, the real-time gross settlement system which works in an integrated manner with the electronic securities transfer and settlement system, TIC-ESTS. Stock exchange payments, cheque clearing and credit card

⁴ The CBRT Law permits the CBRT to determine the appropriate tools and procedures for payments, to continuously monitor system compliance with the Core Principles for Systemically Important Payment Systems (Core Principles for SIPS) in order to prevent the systemic risks that can arise from payment systems, to monitor developments that can affect the effectiveness and reliability of the systems and to coordinate its work with other supervisory authorities and system participants.

⁵ www.tcmb.gov.tr.

payments as well as other large-value interbank payments are settled in TIC-RTGS. All payments in the BTOM and BKM are settled in the settlement accounts at the CBRT.

Takasbank has giro and TIC-RTGS accounts at the CBRT. Payments in connection with securities transactions between Takasbank members are settled net in the Takasbank accounts. The banks' net claims are directly transferred from their Takasbank giro account to their TIC-RTGS account.

Accounts do not bear interest, and are used for funds transfers between the account holders, including settlement of obligations arising from interbank clearing systems. Banks hold giro accounts, reserve requirement accounts and TIC-RTGS accounts. Giro accounts are used mainly for cash withdrawal. The funds maintained in giro accounts are usually a small portion of the total bank funds deposited with the CBRT. A separate account, the TIC-RTGS account, is used for payments routed through TIC-RTGS. Although banks' reserve requirement accounts are separate from their settlement accounts, the balance of the former is transferred to the latter at the beginning of each day for settlement purposes.

In addition to the services mentioned above, the Treasury, exchange offices, public entities (state-owned economic enterprises and ministries) and international organisations (IMF, World Bank, Asian Development Bank) hold accounts with the CBRT.

1.2.2.1 The central bank's provision of (standing and emergency) credit and liquidity facilities

In order to meet temporary liquidity shortages and hence to mitigate liquidity risk in TIC-RTGS, the CBRT provides banks with an intraday liquidity facility between 09:00 and 15:00 (since July 1999) and a late liquidity window facility between 16:00 and 17:00 (since July 2002), both of which are fully collateralised.

Further, subparagraph (c) of paragraph (I) of Article 40 of the CBRT Law authorises the CBRT to extend credits to banks that are the subject of uncertainty and lack of confidence in the event of accelerated withdrawals and uncertainty and lack of confidence in the banking system, in the amount necessary to cover the withdrawal of funds, the conditions of which shall be determined by the Bank. Within this framework, the CBRT provides fully collateralised liquidity support credit (emergency credit) to banks that are illiquid but solvent and are experiencing uncertainty and concerns regarding soundness, in the case of increased concerns about the safety and soundness of the banking system and an accelerated run on deposits.

Taking into consideration the provision of these facilities to financial market infrastructures, only the banking-licensed ISE Settlement and Custody Bank (Takasbank) can obtain these facilities within their borrowing limits as determined by the CBRT.⁶

1.2.2.2 The role of the CBRT as banker for the government

According to a provision in subparagraph (a) of paragraph (III) of Article 4 of the CBRT Law, the CBRT is the government's financial and economic advisor, fiscal agent and treasurer. In this respect, the CBRT has the following duties:

- Acts as financial and economic consultative body of the government.
- Acts as fiscal agent for the government in the international financial and economic relations of the state.

⁶ According to a provision of the interbank money market implementation rules, the CBRT has established certain borrowing limits for each bank in the interbank money market operating in the CBRT. As it has a banking licence and participates in TIC-RTGS, Takasbank has a set limit, determined by the CBRT, on its use of interbank money market facilities.

- Carries out the financial servicing of all types of domestic borrowing notes in the primary market on behalf of the Treasury.
- Executes collections and disbursements of the state and all Treasury operations both within the country and abroad, as well as domestic and foreign money transfers and remittances of all types.

1.2.3 Cooperation with other institutions

Cooperation between the CBRT and other authorities is based on mutual understanding. For example, the CBRT has cooperated with the CMB on the project for safekeeping of customer securities under the customer's name in the Central Registry Agency (see Sections 1.3.4 and 4.3.3).

In order to perform public payments in a more efficient and effective manner and promote better cash planning and management, the CBRT has cooperated closely with the Ministry of Finance and the Undersecretariat of the Treasury on the public electronic payment system project (KEOS) for improved public payments processing. This cooperation has continued through the implementation of KEOS all over Turkey.

According to the CBRT Law, the CBRT is entitled to receive financial information from all financial institutions, including the BRSA. Moreover, in August 2000, the CBRT, the Undersecretariat of the Treasury and the BRSA signed a memorandum of understanding on information-sharing in the financial sector.

1.3 The role of other private and public sector bodies

1.3.1 Financial intermediaries

As of December 2010, the financial sector in Turkey comprised 49 banks, 35 financial leasing companies, 76 factoring companies, 11 consumer finance companies, six asset management companies, 57 insurance companies, of which 14 were individual pension companies (140 pension funds), along with 485 mutual funds, 103 intermediary institutions, 31 securities investment trusts, 18 real estate investment trusts, two venture capital trusts and 28 portfolio management companies.

1.3.1.1 Financial intermediaries providing payment services

1.3.1.1.1 Banks

Banks in Turkey are established as joint stock companies and are subject to the provisions of the Banking Law. In line with the criteria set forth in this law, a bank established abroad may also operate in Turkey by opening a branch. There is no distinction between foreign and Turkish banks in terms of the regulatory and supervisory framework.

Banks in Turkey are grouped into deposit banks, investment and development banks, and participation banks.⁷ Most banks have largely computerised their operations. Internet banking services are offered by all commercial banks.⁸

⁷ As of December 2010, there were 32 deposit banks (three public, 11 private, one SDIF-controlled bank and 17 foreign banks), 13 development and investment banks (three public, six private and four foreign banks), and four participation banks. The total number of branches of all banks, including participation banks, was 10,072 and the total number of personnel was 191,207 as of December 2010.

⁸ These services include a variety of technology-intensive applications such as online credit transfers, online investment accounts, and trading of government bonds, mutual funds and equities. Many banks offer customers a real-time funds transfer service through TIC-RTGS.

All types of deposit banks – private, public or foreign – perform traditional banking operations such as deposit-taking, payment services, foreign exchange operations and marketing of securities and other financial products. However, deposit banks are not allowed to provide financial leasing activities. Deposit banks, with a nationwide branch network, provide most of the payment services. Sight deposits are mostly used for funds transfers. Banks offer cheque and card facilities for account holders. Deposit banks are members of the national RTGS system, TIC-RTGS and interbank clearing houses (BTOM).

The development and investment banks carry out all banking operations apart from taking deposits. They provide investment advisory services and consultancy on transfer and merger issues, financial restructuring and efficient management practices in commercial enterprises. They also grant credits from their own funds and other funds under their management and they offer cheque accounts and participate in the BTOM clearing.

Participation banks operate pursuant to the Banking Law No 5411. Similar to deposit banks, they can collect deposits in Turkish liras (TRY) and foreign currency. However, they operate on profit- and loss-sharing principles in raising funds. In allocating funds they operate on a trade (murabaha⁹), leasing and profit-loss partnership basis. In other words, they neither pay interest on deposits nor demand it from customers they lend to.

Participation banks provide payment services and cheque and card facilities, and participate in clearing and settlement in the same way as other banks. In contrast to deposit banks, participation banks are allowed to engage in leasing activities along with development and investment banks. Currently, there are four participation banks in Turkey and their share in the total financial system is around 5%.

1.3.1.1.2 The Post Office

The Post Office (the General Directorate of Posts, which in terms of organisation is structured under the Ministry of Transportation) plays a significant role in providing payment and remittance services to customers all over Turkey. At the end of 2010, there were 3,732 Post Office branches that handled remittances. The Post Office offers cheque accounts and money order services. The money order facility can be used for remitting money all over the country and beneficiaries are not required to have an account with the Post Office.¹⁰ In addition to these services, Post Office branches can issue domestic traveller's cheques, change foreign currency and receive postal money orders from abroad.

1.3.2 Istanbul Stock Exchange (ISE)

The ISE, which started operations in 1986, is the only securities exchange in Turkey. It is a public institution regulated by the CMB. Government bonds, treasury bills, CBRT liquidity bills, capital market instruments, share income certificates and international securities are traded on the ISE.

The bonds and bills market is the only organised, fully automated market for both outright purchases and sales and repurchase/reverse repurchase transactions with fixed income securities. The purpose is to provide an environment for the secondary market trading of debt securities comprising government bonds, treasury bills, corporate bonds and bonds issued by the Privatisation Administration and central bank liquidity bills. Treasury bills and

⁹ Murabaha is a contract sale between the bank and its client for the sale of goods at a price which includes a profit margin agreed by both parties. As a financing technique, it involves the purchase of goods by the bank as requested by its client. The goods are sold to the client with a mark-up. Repayment, usually in instalments, is specified in the contract (for further details, see <http://www.tkbb.org.tr/en>).

¹⁰ In 2010, 37.3 million domestic money orders worth TRY 51.1 billion were processed by the Post Office.

government bonds are the most actively traded instruments. The bonds and bills market was established in June 1991, while repurchase/reverse repurchase transactions began in February 1993.

1.3.3 ISE Settlement and Custody Bank, Inc (Takasbank)

Takasbank clears and settles ISE trades and acts as the clearing house for the Turkish Derivatives Exchange (TurkDEX). It is also the official custodian for investment and private pension funds and the national numbering agency for securities issued in Turkey.¹¹

Takasbank was originally set up in 1988 as a department of the ISE, with responsibility for settlement and custody. In 1991 it became an independent organisation and in 1996 it was converted into a bank. As a specialised sector-specific non-deposit-taking investment bank, Takasbank provides ISE members with both cash and non-cash credit mechanisms that support settlement completion. Accordingly, Takasbank operates both a securities lending market and a money market as well as providing cash credit to capital market participants.

Takasbank's banking services are regulated by the BRSA and the CBRT, and its clearing and settlement functions by the CMB and ISE.

Takasbank settles securities trades in all ISE markets. The ISE clears and settles ISE trades using multilateral netting. Net obligations are legally binding, but Takasbank does not guarantee settlement. As a result of the DVP principle applied, its members do not take delivery of their receivables unless they fulfil their obligations. In case of partial fulfilment of the obligation, a proportional payment or a transfer from the receivable due is made to the member.

Takasbank also provides custody services for private pension fund participation certificates. It also carries out custody, settlement and other related operations for pension fund transactions in capital markets.

Takasbank has a correspondent relationship with Euroclear Bank. In this capacity and through its SWIFT membership, as well as via nostro accounts held with Euroclear Bank, Takasbank provides international settlement and custody services for foreign securities such as eurobonds, foreign bonds, depository receipts and warrants. As of the end of 2010, some 83 institutions receive international securities correspondent services from Takasbank.

1.3.4 Central Registry Agency

The Central Registry Agency (CRA) is the central securities depository for dematerialised capital market instruments in Turkey. The CRA is a private company established in 2001 as a legal entity under the provisions of the Capital Markets Law and is regulated by the CMB. The CRA keeps electronic records on issuers, intermediary institutions and owners of rights. The CMB determines which capital market instruments the CRA issues in its electronic book-keeping system on a beneficial owner basis. The rights affixed to those securities are also determined by the CMB. The Central Dematerialised System was put into operation in November 2005. The CRA took over central securities depository functions for equities on completion of the dematerialisation system. All equities are registered as dematerialised shares in the Central Dematerialised System. Clients' safekeeping accounts were transferred from Takasbank to the CRA and book-entry records were automatically registered by the CRA in line with the dematerialisation process and recorded at the beneficial owner level. Takasbank currently has a 65% stake in the share capital of the CRA. Takasbank will

¹¹ Takasbank is the national numbering agency authorised by the CMB to allocate ISIN and CFI codes to securities and other financial instruments issued in Turkey.

maintain its functions as the clearing and settlement institution for the ISE, providing the omnibus account with the CRA for securities settlement purposes. As the CRA and Takasbank systems will be interlinked in real time, securities for which transfer orders are entered in the system will be instantaneously reflected in the CRA. Real-time gross DVP member-to-member¹² settlement will continue to be executed via Takasbank.

1.3.5 Banks Association of Turkey

The Banks Association of Turkey (BAT) was founded in 1958 under Article 57 of the Banks Law (Law No 7129 enacted in 1958). Its duties and powers have been revised in the new Banking Law (Law No 5411 enacted in 2005). The BAT is a legal entity with the status of a public institution, and it is the representative body for all banks operating in Turkey with the exception of the participation banks (see Section 1.3.1.1.1).

All deposit, investment and development banks operating in Turkey are legally obliged to become members of the BAT. Each bank is represented in the Association by its chairperson, managing director or general manager.

The BAT is responsible for:

- ensuring the development of the banking profession;
- ensuring that banks function in a prudent and well disciplined manner as required by the BAT itself and the banking profession in order to meet the needs of the national economy;
- adopting and implementing all measures necessary for the prevention of unfair competition among banks;
- determining the principles and conditions to be respected by banks, based on approval by the BRSA; and
- ensuring cooperation among banks for joint projects, in collaboration with the BRSA.

The BAT monitors implementation of the decisions taken pursuant to the applicable legislation and measures required by the BRSA. The organisational structure of the Association consists of the General Assembly, the Board of Directors, the Secretariat General and the Auditors. The BAT carries out its activities through several structural and functional groups.

1.3.6 Participation Banks Association of Turkey

The Participation Banks Association of Turkey (TKBB) was founded in 2005 under Articles 79–81 of the Banking Law (Law No 5411). The TKBB is an institutional association, similar to the BAT, and its members are participation banks (see Section 1.3.1.1.1). The status of the TKBB was defined by the Participation Banks Association Decree of the Council of Ministers (No 2006/10018). The Association comprises the General Assembly, the Board of Directors, Auditors and the Secreteriat General.

The main objective of the Association is to defend the rights and interests of participation banks within the framework of the free market economy and full competition principles and banking system regulations; to carry out studies and research for the enhancement and

¹² Takasbank manages the DVP system. There are two different DVP settlement mechanisms. One is near-simultaneous net settlement (for all on-exchange transactions) and the other is gross settlement (for broker-to-custodian transactions after netting). All DVP settlements are executed on netted transactions.

healthy functioning of the banking system; and to promote legislation that maintains a competitive marketplace while avoiding unfair competition.

2. Payment media used by non-banks

2.1 Cash payments

Cash is the dominant retail payment medium in Turkey, although in recent years there has been a growing tendency to use alternative payment methods. No exact figures are available for cash payments. As of March 2011, total banknotes and coins in circulation amounted to TRY 52.1 billion. The share of cash in M1 (51.2% in 2011) illustrates the dominance of cash payments in Turkey. Cash withdrawals are made mainly from bank branches or cash dispensers. Banks encourage the use of ATMs for cash withdrawals, and their usage is increasing.

The use of cash to pay wages, salaries and pensions is declining as credit transfers account for an increasing proportion of such payments.

The CBRT is the sole issuing authority for banknotes with the status of legal tender. As of 1 January 2005, six zeros were removed from the Turkish lira (TRL) and the currency was renamed the new Turkish lira (TRY).¹³ The sub-unit, which is one 100th of a Turkish lira, is called the kuruş (Ykr). Banknotes are issued in denominations of TRY 5, 10, 20, 50, 100 and 200. The TRY 50 note has the largest share of the currency in circulation.

Coins are issued by the Undersecretariat of the Treasury in six denominations: one, five, 10, 25 and 50 kuruş (Ykr) and one Turkish lira.

TRL banknotes and coins were withdrawn from circulation at the beginning of 2006. However, as of 1 January 2006, they became convertible into TRY at the CBRT and T.C. Ziraat Bank, which is the biggest public bank, for a period of 10 years for banknotes and one year for coins.

2.2 Non-cash payments

2.2.1 Non-cash payment instruments

2.2.1.1 Cheques

The Turkish Commercial Code and the Cheque Law govern all aspects of cheque payments and provide the framework for issuance, acceptance and payment of cheques. Banks provide a cheque account facility to their customers in accordance with the Cheque Law. The drawer bank pays the cheques directly or through clearing houses. Cheques are free of collection charges for both the drawer and the payee. However, if a cheque is paid by a branch other than the branch where the account is maintained, an authorisation charge is usually levied.

Traveller's cheques are issued by banks and are not accepted for interbank clearing. Banks collect traveller's cheques and send them directly to the branch of the paying bank for payment.

¹³ The word "new" was dropped from the name of the currency at the end of a transition period determined by the Council of Ministers.

The number of cheques that were subject to a clearing house process in the Interbank Clearing Houses Centre (BTOM)¹⁴ decreased by 20.5% between 2006 and 2010 (in 2010 18.7 million cheques were used). The value of cheques processed increased by 21.1% and reached TRY 228 billion (USD 146.1 billion).

2.2.1.2 *Postal cheques*

The Post Office provides postal cheque account facilities to any firm or individual. No interest is paid on these accounts, nor are commission charges levied. Postal cheque accounts are used mostly by public institutions for collecting various types of tax and by companies for receiving payment instalments.

More than 1,432,000 postal cheque accounts were maintained in 2009, up by 106.9% from 2006. Some 15.4 million postal cheques were processed for a total value of TRY 37.8 billion, an increase of 51% over 2006.

2.2.1.3 *Promissory notes*

Promissory notes are commonly used in the small and medium-sized business sector by firms that lack access to bank credit or the capital markets. Such notes are defined in the Turkish Commercial Code and do not contain any bank information. A valid promissory note must be signed by both counterparties and should indicate the amount due and the value date. The beneficiary may obtain funds before the value date by presenting the promissory note to a bank for discount.

Usage of promissory notes has fallen over time while that of alternative payment and credit instruments such as credit cards and cheques has increased.

2.2.1.4 *Credit transfers*

Credit transfers are an increasingly popular means of transferring funds between customers. To make such transfers, customers are required to maintain sight deposits, which carry a low interest rate.

There are two categories of credit transfer: (i) credits to other account holders with any bank; and (ii) credits to non-account holders. The first is an ordinary credit transfer operation between two accounts. The account holder gives a written transfer order, which is carried out if there are enough funds in the account. The second category of credit transfer enables funds to be sent to a beneficiary who does not maintain an account with any bank. In this case, the customer making the payment specifies the name of the beneficiary, the address and the bank/branch where the payment is to be made. When the transfer reaches the counterparty bank/branch, the beneficiary is notified of the remittance and can withdraw the money from that branch.

All interbank credit transfers are processed electronically. Most branches receive credit transfer instructions from customers in written form and these are sent electronically to the final destination. Most banks also provide a credit transfer facility via ATMs, the internet and telephone.

Bank customers can issue standing orders for regular payments that are executed automatically on specified dates. The Post Office also provides credit transfer facilities to its account holders.

¹⁴ To facilitate electronic processing, cheques are coded with MICR (magnetic ink character recognition) code in E13B format.

In 2010, 180.1 million credit transfers were executed.¹⁵ This represents a 50.5% increase since 2006. Some 142.8 million credit transfers were processed via TIC-RTGS and 37.3 million via the Post Office.

2.2.1.5 Payment cards

2.2.1.5.1 Credit cards

Credit cards offer a cashless payment medium combined with a revolving credit and cash advance facility. In recent years, many banks have also introduced a facility for the interest-free instalment repayment of credit card debt. Such features have made credit cards very popular and their numbers are steadily rising. Cardholders are charged an annual subscription fee while merchants pay a commission to the acquirer.

Credit cards were first introduced in 1968, but their growth began in the early 1990s. In the last decade, the number of credit cards provided to customers by banks and financial institutions has risen strongly. By the end of 2009, the total number of credit cards issued in Turkey reached 44.4 million, an increase of 37% since the end of 2006. In 2009, the total number of transactions inside and outside Turkey on cards issued in Turkey was 1.85 billion, for a total value of TRY 202.8 billion.

In March 2006, Turkey became the third country in Europe to launch the chip and PIN method (PIN entry and offline PIN validation for chip credit card purchases). The chip and PIN is a new payment method that mitigates the risk of credit card fraud by preventing counterfeit and the abuse of lost or stolen cards.

The Interbank Card Centre (BKM) ran a campaign to raise PIN security awareness among card users in 2009. End-2009 figures show that 98% of point-of-sale (POS) terminals and 98.5% of credit cards in the market are compliant with the Europay, MasterCard and Visa (EMV) standard. BKM has recently prepared local regulations for cash withdrawal with credit cards at the point of sale.

2.2.1.5.2 Debit cards

Debit cards are typically used to withdraw cash and to send remittances by debiting the holder's account via an ATM. Since 1994, it has also been possible to use them for retail purchases direct from the current account via POS terminals. To create awareness of debit card use at the point of sale, BKM launched an advertising campaign beginning in October 2004, with the aim of broadening the use of debit cards and convincing cardholders to use debit cards instead of cash when shopping. As a result, the total volume and value of such purchases increased by about 140% over a two-year period, reaching 154 million transactions with a total value of TRY 4.93 billion in 2009. These promotional efforts by BKM are continuing.

At the end of 2009, the total number of debit cards was 64.7 million. At end-2009, 1,714,996 POS terminals that accept debit cards were available at 1,132,059 merchant outlets, including department stores, supermarkets, petrol stations, and numerous retailers in sectors such as clothing and luxury goods, food, electronics, drugs and sanitary products, furniture, car rentals, etc.

The latest development in debit card services allows consumers to withdraw cash at selected retail stores through POS terminals. This "cash-point" service, which was introduced by a major bank in January 2006, resembles a cash-back transaction, but does not require the

¹⁵ Interbank transfers only; data on intrabank transfers are not available. The Post Office figure covers only domestic transfers. For postal cheque transactions by the Post Office, see Section 2.2.1.2.

consumer to make a purchase at the retail store in question. The service is free of charge and, as of June 2006, was available at 217 cash points.

Furthermore, in March 2006, BKM prepared the infrastructure and the local regulations that allow all applicant member banks to provide a cash withdrawal service on a debit card purchase transaction (“cash-back”) at the point of sale.

Since the completion of the BKM-managed ATM Sharing Project in 2009, it has been possible to use any debit card in any ATM for cash withdrawal and account balance inquiry transactions.

2.2.1.5.3 Prepaid cards

The most frequently used prepaid cards are disposable phone cards issued by Turkish Telekom for making calls from public telephones, reloadable cellular phone cards issued by GSM operators, reloadable payment cards for road tolls, and reloadable public transport tickets issued by municipalities.

The municipalities of some cities, including Istanbul and Izmir, provide reloadable tokens and cards for travel on public transport and for paying utility bills.

In 2009, banks stepped up their efforts to implement prepaid card programmes. In addition to gift cards, Turkish banks have started to issue contactless prepaid cards with additional features such as personal identification, public transport payment functions, etc.

2.2.1.6 Other access channels for banking and payments

2.2.1.6.1 Telephone banking

Since the introduction of telephone banking in 1991, the range of phone banking services has increased. Besides being able to transfer funds and make account balance enquiries over the telephone, bank customers can also pay bills or credit card balances, trade mutual funds or stocks, and set up time deposits.

2.2.1.6.2 Internet banking

The growth and spread of internet banking services has been unexpectedly strong, reflecting a high degree of public acceptance. First introduced in 1997, internet banking is now provided by all deposit-taking banks, allowing consumers to make account balance enquiries, transfer funds (including transfers to third-party accounts with other banks), trade mutual funds or stocks, apply for loans, pay credit card balances or bills, and trade or transfer foreign exchange. In addition, other services, such as operations related to insurance and pension funds, are increasingly available via internet banking.

As of September 2010, the population of internet banking service customers stood at 6.4 million, an increase of 49% over 2007.

2.2.1.6.3 Mobile phone-related payments

Since 2000, bank customers have been able to conduct banking transactions on GSM-standard mobile phones. Initially available only on mobile phones with WAP-GPRS functionality, mobile banking was extended to all types of phones after about a year. Most types of retail banking transactions are now possible via mobile phone.

NFC (Near Field Communication) is a short-range wireless technology that enables mobile phones to make payments by equipping them with a contactless card. The number of NFC pilot projects started to increase during 2009. BKM has completed its NFC OTA (over-the-air) infrastructure and it has also introduced an NFC portal to provide users with information about NFC and upgrades.

2.2.2 Non-cash payment terminals

2.2.2.1 ATMs and POS terminals¹⁶

The first ATM service in Turkey started in December 1987. Since then, ATMs have continuously increased in number. At the end of 2009, a total of 23,800 ATMs were installed in Turkey, some 44% more than in 2006. ATMs allow consumers to check their current account balance, withdraw cash, initiate credit transfers, pay bills or credit card debts, access their investment accounts and initiate transactions. In addition, some banks have begun to operate advanced ATMs that allow consumers to deposit cash, which becomes instantly available in their current account. Some banks also allow withdrawals in foreign currencies through a limited number of ATMs, typically located in tourist areas.

BKM member banks have made significant investments in the payments infrastructure by installing POS terminals that authorise and record transactions at merchant outlets. At the end of 2009, there were 1.7 million POS terminals, an increase of 35.6% since 2006.

2.2.3 Recent developments

From 2009, banks have embarked on an increasing number of contactless payment card and contactless POS projects. As NFC technology is based on contactless payment standards, this activity has led to a higher level of “NFC readiness” in Turkey.

The total number of contactless credit/debit cards rose from 705,000 in April 2009 to 1,820,000 by the end of the same year, while POS numbers increased from 9,063 to 17,827. By the end of 2009, the annual value of contactless transactions had reached TRY 26.5 million.

3. Payment systems (funds transfer systems)

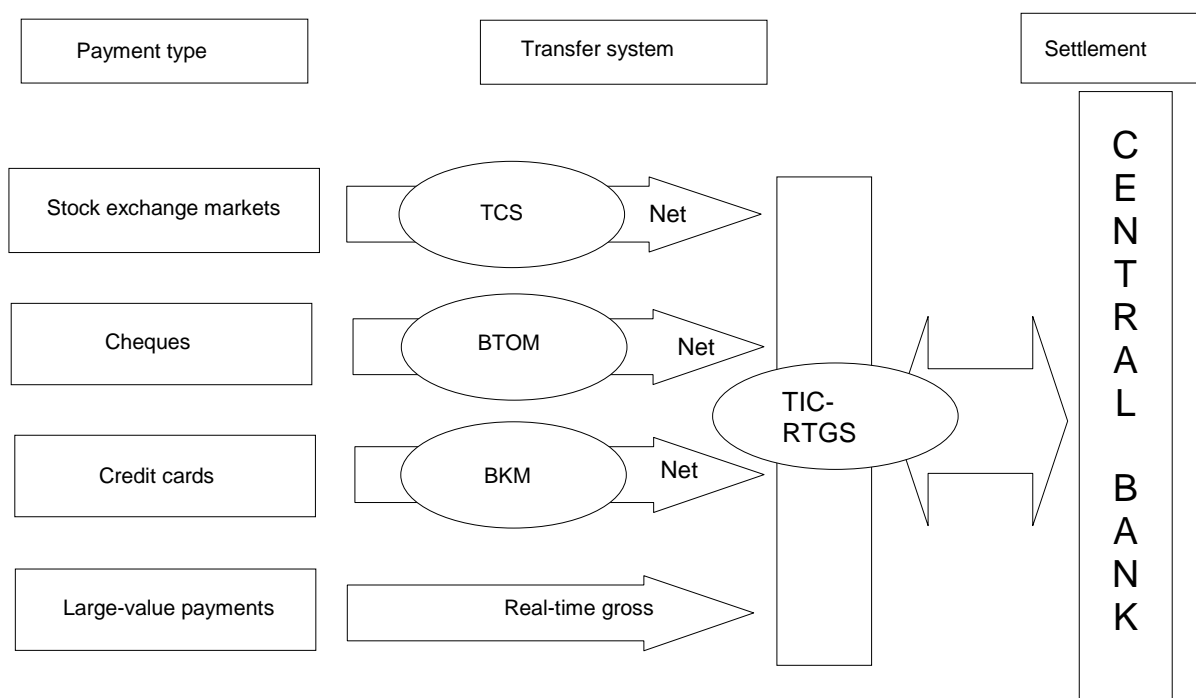
3.1 General overview

In Turkey, the major interbank payment systems are those related to stock exchange payments, cheque clearing and credit card payments, and other large-value interbank payments. These include:

- TCS: the Takasbank clearing system;
- BTOM: the system of the Interbank Clearing Houses Centre;
- BKM: the Interbank Card Centre system; and
- TIC-RTGS: the RTGS system of the CBRT.

¹⁶ As of end-2009, the GPS-defined locations of all ATMs operated by BKM members (in the whole of Turkey and the Turkish Republic of Northern Cyprus) are indicated on Google Maps and can be called up via a “closest ATM” application on internet or mobile phone.

Chart 1
Organisation of the Turkish interbank payment systems



TIC-RTGS is a real-time gross settlement system, whereas the BTOM and BKM are deferred net settlement systems. Payment obligations resulting from stock exchange transactions are settled through the TCS.

All payments in the BTOM and BKM are finally settled in the books of the CBRT. A separate account, the TIC-RTGS account, is used for settlement of interbank payments processed by TIC-RTGS. The BTOM and BKM have settlement accounts at the CBRT. Banks monitor their liquidity position by reviewing the balances in all settlement accounts. As for the settlements in the TCS, the banks' net claims are directly transferred from their Takasbank giro account to their TIC-RTGS account.

3.2 Large-value payment systems

3.2.1 The real-time gross settlement system: TIC-RTGS

3.2.1.1 Institutional framework

TIC-RTGS is Turkey's real-time gross settlement system. The system is owned, operated, regulated and overseen by the CBRT. TIC-RTGS was developed between October 1989 and March 1992 with live operations starting in April 1992.

Driven by the changing demands of the banking sector and developments both in the payment systems area and in technology, a project was started in 1997 to develop the second-generation system, which started live operations in April 2000.

The second-generation RTGS system introduced an emergency backup centre and many other new features, including a central queuing mechanism, funds management facilities, a direct debiting operation, phased closure of operations, and message bulking for low-value payments.

The scope of the second-generation project also covered the development of an electronic securities transfer and settlement system, TIC-ESTS, which went live in October 2000 (see Section 4.3.1).

TIC-RTGS and TIC-ESTS work in an integrated manner. Participant banks access them using a single interface, called SWITCH (a message-switching system). TIC-RTGS and TIC-ESTS are directly connected to SWITCH through a proprietary network (TICNET).

Owing to their integration and common interface, TIC-RTGS and TIC-ESTS are usually regarded as a single system, which is referred to as TIC-RTGS and ESTS.

The CBRT Law, as amended in April 2001, defines the central bank's duties and responsibilities with respect to payment systems. The law authorises the CBRT to establish payment systems, determine the procedures and conditions of payment methods and instruments, and draw up regulations for ensuring their smooth operation. The operational procedures, rights and obligations of the CBRT, as the system operator, and the participants in the system are governed by private agreements. These are supported by procedures and rules documented in the TIC-RTGS and TIC-ESTS Operational Rules, the TIC-RTGS and TIC-ESTS User Guide, the TIC-RTGS and TIC-ESTS Disaster Recovery Guide, and the relevant CBRT circulars.

3.2.1.2 Participation

In accordance with the Banking Law, banks may participate in TIC-RTGS and TIC-ESTS. Participants must be established in Turkey and maintain giro accounts with the CBRT. It is not obligatory for all banks to participate in TIC-RTGS and ESTS. Banks that do not participate in the system may access it through one of the participant banks. At end-2010, there were 48 direct participants in TIC-RTGS and TIC-ESTS, including the CBRT.

For ISE members that are not direct participants in TIC-RTGS and TIC-ESTS (eg brokerage houses), Takasbank (see Section 1.3.3) has developed a proprietary system called TETS through which brokerage houses can access TIC-RTGS and TIC-ESTS for cash and securities (government bonds and T-bills) transfer purposes.

3.2.1.3 Types of transactions

The TIC-RTGS system is used for interbank payments in Turkish liras relating to interbank operations (eg money market and securities settlement transactions), final settlements of cheque and credit card operations, and customer payments.

Since TIC-ESTS is integrated with TIC-RTGS, the settlement of the payment leg of all DVP operations is carried out in TIC-RTGS.

The system provides facilities for the exchange of payment-related information messages between participants.

3.2.1.4 Operation of the system

TIC-RTGS is based on a V-shaped architecture, where the entire message is sent to the TIC-RTGS Centre by the remitting bank. A payment instruction embodied in the message is executed only if the remitting bank has sufficient covering funds in its TIC-RTGS account. A successful execution of the payment instruction will result in the transfer of the payment from the remitting to the receiving bank across their TIC-RTGS accounts. The message is then forwarded in real time to the receiving bank.

Payments that cannot be settled because of insufficient funds are placed in a centralised payments queue. The queuing algorithm is first-in-first-out (FIFO) within priorities. TIC-RTGS has a gridlock resolution algorithm for queued payments (see Section 3.2.1.7.2).

Settlement in TIC-RTGS is final and irrevocable. If an operational error occurs, the parties involved must resolve it bilaterally. Participants can check their TIC-RTGS accounts at any

time during the business day from their relay computers (see Section 3.2.1.5) and from the TIC-RTGS Centre. Participants may obtain a number of reports from their relay computers.

A typical business day lasts about 21 hours. The system opens at 08:00¹⁷ on Monday and on days following official holidays. On every workday, the participants log on to the system by 09:00. The system closes at 17:30 and reopens after the end-of-day operations approximately at 20:30 on regular workdays.¹⁸ It closes at 13:00 on half-workdays.¹⁹

During the end-of-day procedure, the balances of TIC-RTGS settlement accounts are transferred to the participants' CBRT accounts. The housekeeping process lasts around three hours, and at about 20:30 the system opens to receive messages with the next business value date. On Fridays and on the eve of official holidays, however, the system remains closed until 08:00 on the next business day. TIC-RTGS is closed during weekends and official holidays; hence, it operates 252 days a year on average.

3.2.1.5 Transaction processing environment

The TIC-RTGS system comprises a relay computer (RC) located on the participant's premises, a proprietary communication network (TICNET), and a central computer system.

Every participant, including the CBRT, must have an RC to participate in TIC-RTGS. The RC system, which provides all the functionality needed by the participant, is a standard hardware and software configuration managed by the CBRT. The RC provides the participant with secure message entry, message verification, account enquiry, archiving and backup facilities. The RC has a mirror copy of the central computer's reserve balances for each participant. This obviates the need for a query system on the central computer. The central bank's RC has some additional facilities. The participant's primary RC can be backed up online to a secondary RC in case of primary RC failure.

A participant's host computer can be integrated into TIC-RTGS through a connection to the RC. In this way, a host terminal at a bank branch can be used to generate payment messages. Currently, 90% of banks have host connections with TIC-RTGS. In case of a host computer failure, a bank can still send payments via its RC.

Backup facilities safeguard the TIC-RTGS Centre's computer system from breakdowns due to any single point of failure. The systems used for system development and maintenance are separate from the production system.

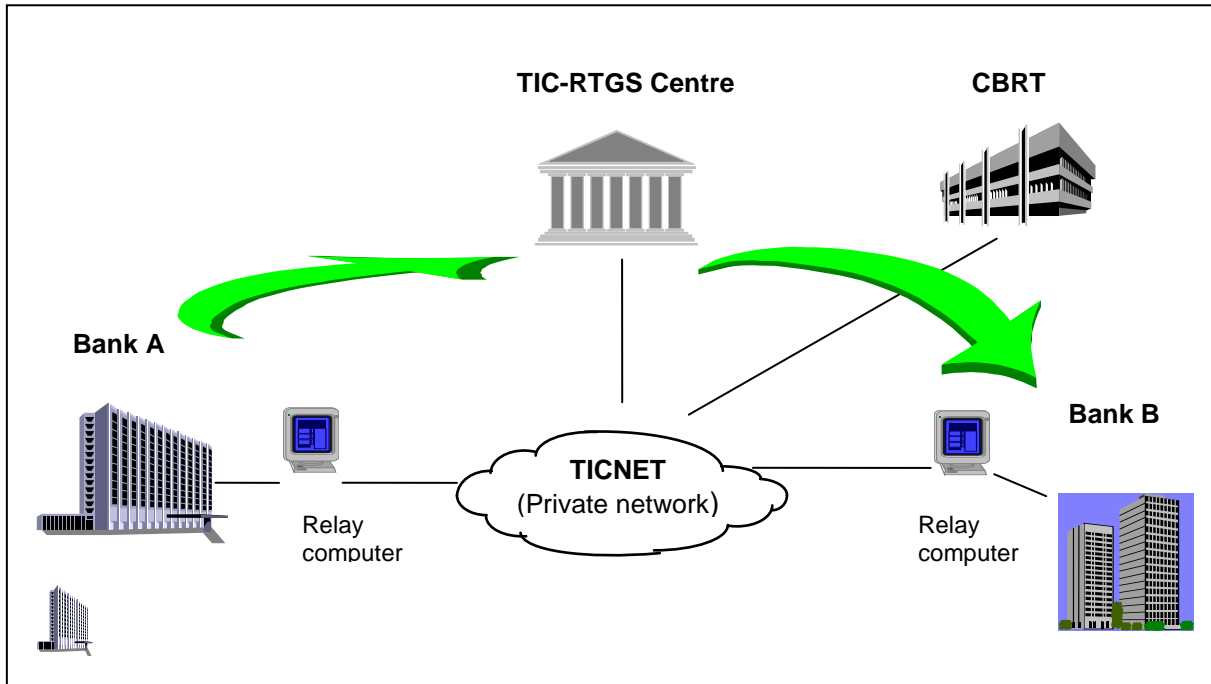
A secondary centre (emergency backup centre) has been set up to take over operations in a very short time in the event of complete site failure at the primary centre. Moreover, in case of an online connection failure, offline facilities are also available for RC-host computer and RC-Centre connections.

¹⁷ Turkey's time zone is CET+1.

¹⁸ Except for Fridays.

¹⁹ For the National Day (29 October) and two religious holidays (Bairams), the preceding day is officially a half-workday.

Chart 2
TIC-RTGS system configuration



RCs are connected to the TIC-RTGS Centre via the private TCP/IP network TICNET. Participants access TICNET nodes through leased telecommunication lines. TICNET is operated by the CBRT, and the participants share its operating costs. Participants' leased lines are backed up by ISDN and G.SHDSL lines.

A high degree of security is provided in TIC-RTGS. Multilevel security controls have been implemented to ensure the integrity, authenticity and confidentiality of transactions. Data transfers between RCs and TIC-RTGS are secured by data encryption.

3.2.1.6 Settlement procedures

All messages received at the TIC-RTGS Centre are processed immediately, either by being settled, should the sender have sufficient funds for the payment, or otherwise by being queued. Settlement is final and irrevocable.

TIC-RTGS accounts are used for settlement. Settlement is in central bank money. Initial values for these accounts are transferred from participants' reserve requirement accounts at the CBRT at the beginning of each business day. A bank can request a transfer of funds from its free (giro) account at any time during the business day. At the end of the day, the balances in the TIC-RTGS accounts are transferred back to the participants' reserve requirement accounts at the CBRT.

Funds are made available to the recipient bank immediately after settlement in the TIC-RTGS account. The TIC-RTGS and ESTS Operational Rules recommend that customer accounts be credited the same day.

In order to help settle as many payments as possible, the gridlock resolution algorithm (see Section 3.2.1.7.2) is manually run before the end of the day. Moreover, all funds reservations (see Section 3.2.1.7.2) are released upon the End-of-Day Announcement, a message issued by the TIC-RTGS Centre five minutes before system closure. Any payments that remain

unsettled are cancelled and participants are informed via notification messages at the end-of-day procedure.

3.2.1.7 Risk management in TIC-RTGS

3.2.1.7.1 Credit risk

In TIC-RTGS, payment instructions are executed only if there are sufficient funds in the participant's TIC-RTGS account. There is thus no credit risk arising from any payments accepted in the system. Recipients are notified after the payments are settled. The central bank's intraday liquidity provisions for system participants are fully collateralised.

3.2.1.7.2 Liquidity risk

To meet temporary liquidity shortages and hence mitigate liquidity risk in TIC-RTGS, the CBRT provides banks with an intraday liquidity facility between 09:00 and 15:00 (since July 1999) and a late liquidity window facility between 16:00 and 16:30 (since July 2002), both of which are collateralised. The latter facility is provided to banks between 16:00 and 17:15 on the last working days of the required reserve maintenance periods.

The intraday liquidity facility is provided to banks within their borrowing limits. The banks pay no interest on this facility, but a commission of 0.0048% is levied on the principal amount of each transaction. The facility must be repaid by the end of the day or the bank's collateral is liquidated and its intraday liquidity is converted into a penalty-bearing overnight credit.

As a lender of last resort, the CBRT also provides the late liquidity window facility to banks. Under this facility, banks can lend money to the CBRT at the central bank's borrowing rate and borrow from the CBRT at the central bank's lending rate without any limit, provided that they have full collateralisation.

A range of marketable and liquid assets is accepted as collateral, to which the CBRT applies haircuts according to each asset type's historical price volatility and liquidity. Collateral holdings are blocked on a transaction basis, marked to market, and monitored via a centralised system. Market participants are not able to access this system directly.

Apart from these facilities, participants may use the funds reservation facility to plan their payments. Funds reservations can be managed through two mechanisms:

- Participants may reserve funds for the settlement of high-priority payments (priority reservations).
- Participants may reserve funds for a specific payment anticipated later the same day (earmark).

As a third facility to manage liquidity risk, TIC-RTGS has a centralised payment queue facility. Payments are released from the queue within each priority on a first-in-first-out (FIFO) basis. Participants have full real-time control over their payment queue. They can query their queue, change the priority and order of queued payments, and cancel a payment with the approval of the TIC-RTGS and TIC-ESTS Operation Centre. They can also query the total amount of queued incoming payments.

Moreover, the system has a gridlock resolution facility that allows payment settlements from two or more queues simultaneously without altering predetermined payment priorities, even though the payments cannot be settled separately. The facility, which is transparent to participants, may be used manually or automatically (in preset periods).

3.2.1.7.3 Operational risk

In order to minimise the operational risk of TIC-RTGS, every component of the system has a backup.

A remote emergency backup centre began operating in 2000. The disaster centre was developed to take over operations in about 10 minutes in the event of a complete site failure at the primary centre. In such a case, participants' connections are automatically routed to the backup centre, which takes over the operation without any data loss or duplication.

Moreover, the business continuity arrangements for TIC-RTGS are well documented in the Disaster Recovery Guide and are available for implementation. The guide describes the operational facilities to be used in the event of a failure in any component of the system, defines decision and notification procedures for handling abnormal situations, and includes sample forms for information dissemination as well as contact information for the teams that will take charge in case of a problem. The guide also details the measures that participants should take to mitigate operational risks.

As part of the CBRT Contingency Plan, the emergency backup centre and the TIC-RTGS Disaster Recovery Guide are tested twice a year against different crisis scenarios.

3.2.1.8 Pricing

There is no entrance fee or annual fee for TIC-RTGS and ESTS participants. The CBRT charges transaction fees in order to recover the long-term operational costs and the investment costs of setting up the system. Fees are based on the value of the transaction and charged to the remitting participant.

In addition to transaction fees, there are communication network-related expenses that are shared equally by all participants. The BAT coordinates maintenance and expense-sharing for the RCs and network support.

TIC-RTGS and ESTS pricing structure, 2010¹

Up to TRY 8,000 (USD 5,128)	TRY 0.20 (USD 0.13)
TRY 8,000–612,000 (USD 5,128–392,308)	0.000025 × payment amount
Over TRY 612,000 (USD 392,308)	TRY 15.30 (USD 9.81)
Information message fee	TRY 0.20 (USD 0.13)

¹ The USD exchange rate at end-2010 was TRY 1.56.

3.3 Retail payment systems

3.3.1 Interbank Card Centre (BKM)

3.3.1.1 Institutional framework

The Interbank Card Centre (BKM), established in 1990 by 13 public and private Turkish banks, performs interbank authorisations, and clearing and settlement transactions within the card payment sector; seeks solutions for common issues, conducts nationwide strategic studies on card payment topics, and contributes to establishing and improving domestic rules and standards.

BKM's main fields of activity are:

- to develop procedures to be applied among banks implementing credit card and debit card systems;
- to pursue standardisation and establish domestic rules on card payment practices throughout Turkey;
- to carry out interbank clearing and settlement transactions, and to establish relations with foreign organisations; and, if necessary,
- to represent its members with such organisations and to seek more secure, faster and more cost-effective ways of carrying out card-related banking transactions.

3.3.1.2 *Participation*

As of December 2010, BKM had 27 members (10 shareholders) and four service providers. Membership is open to banks and to members of the Visa or MasterCard payment schemes.

3.3.1.3 *Types of transactions*

The BKM system started operations in 1993, with a view to helping banks to make efficient use of infrastructure and resources, typically by sharing networks and ATMs. The system's services include credit card POS authorisation, credit card ATM cash advances, manual cash advances, quasi-cash advances, ATM debit card cash withdrawals, ATM debit card balance enquiries, POS debit card purchases, ATM PIN management, ATM debit card service fee enquiries, and Visa/MasterCard/Amex routing.

3.3.1.4 *Operation of the system and settlement procedures*

BKM is the service provider for all activities related to the processing of credit card and debit card payments. It clears and settles all domestic credit card payments and settles debit card payments between banks. It also establishes the legal and administrative infrastructure, sets technological standards, issues a national combined warning bulletin, operates the BKM system, and provides training and security services for its members.

BKM has a separate settlement account with the CBRT under a special agreement. This account is used exclusively for credit and debit card settlement. BKM advises the banks and the CBRT of each bank's net debit or credit position. Banks with a debit position send instructions to the CBRT for payment out of their giro accounts. After these accounts have been debited, the payments are credited to the creditor banks. The CBRT has no responsibility for credit and debit card clearing other than providing settlement services. All debits and credits in the settlement account are booked on the basis of the details supplied by BKM.

3.3.1.5 *Risk management*

BKM has an enterprise risk management system. This system aims to define, measure, monitor and control the risks arising from BKM activities, risks that could harm the risk assessment process of BKM member banks and the risks related to the clearing and accounting transactions of debts and receivables generated by card usage. In this context, the risk management system aims to establish policies and implementation procedures, and to monitor and, when necessary change the Centre's activities.

3.3.1.5.1 *Liquidity risk*

BKM has no responsibility for the risks related to the clearing and accounting of transactions between its members. If a member does not meet its clearing obligations on time, BKM's liability is limited to the proportional distribution of available resources to the creditor members and reporting to the respective parties.

3.3.1.5.2 Operational risk

As BKM's services are critical to Turkey's card payment sector, every system in its IT infrastructure has a backup.

A business continuity centre began operating in 1995 at a backup site located in Izmir.²⁰ The backup centre can take over the operations within a few seconds of a complete site failure at the primary centre. In such a case, all member connections are automatically routed to the backup centre, which takes over operations without any data loss or duplication.

BKM's business continuity arrangements are documented in the Business Continuity and Recovery Guides and Procedures for the use of both BKM itself and its members. These describe the facilities to be used in the event of service disruptions, as well as the decision and notification procedures and contact lists for handling those situations. They also specify the measures BKM members should take to mitigate operational risks. In addition, BKM routes all its business through its backup centre for one day a year, making it the only company in the Turkish finance sector to carry out business continuity testing in the live environment.

3.3.1.5.3 Other risks

BKM also assesses its technical, financial and administrative risks in terms of their effects on its financial performance, its members and its reputation. Internal regulations and control mechanisms are formulated with a view to reducing the potential losses from such risks. All these risks are reviewed annually.

3.3.1.6 Major current and future projects

BKM has completed its NFC (Near Field Communication) OTA (over-the-air) infrastructure and introduced an NFC portal to provide users with information about NFC and upgrades. From 2009, banks have embarked on an increasing number of contactless payment card and contactless POS projects. As NFC technology is based on contactless payment standards, this activity has led to a higher level of "NFC readiness" in Turkey.

BKM's public transport-related activities continued in 2010. Negotiations are under way with municipalities and transport operators to increase and standardise the use of contactless cards as a payment method on public transport.

Work on a platform to allow e-payments to the government to be made through the card payment infrastructure has started; the platform is scheduled to go live in 2011.

Another BKM project aims to improve the security of e-commerce by allowing credit or debit cardholders to make payments without entering their card information into the merchant's website.

BKM has also started discussions with the customs authorities on a platform to allow customs duties to be made through POS devices; the system is due to go live in 2011.

Meanwhile, the Joint POS Management System (OPYS) has been developed to manage banks' POS field operations. The system included nine banks and four service companies as of the end of 2010.

²⁰ The Izmir Business Availability Backup Centre (ISYM) operates in synchronisation with the Istanbul Centre.

3.3.2 Interbank Clearing Houses Centre (BTOM)

3.3.2.1 Institutional framework

The Cheque Law defines the Interbank Clearing Houses Centre (BTOM) as a legal entity and empowers the CBRT to supervise and control the cheque clearing process nationwide. The Cheque Law and the CBRT's by-law on the BTOM govern the establishment and functioning of the interbank clearing houses, which operate as branches of the BTOM. The CBRT issues directives and regulates the functioning of all clearing houses.

The Executive Board of the BTOM consists of a representative from the CBRT as chairman and representatives from the 12 banks that are represented on the Executive Board of the BAT. The BTOM is administered by a committee that consists of the CBRT branch manager and three bank representatives. Its operating expenses are financed by member banks according to each bank's share in the total number of cheques processed over the year. Fixed expenditure on such items as acquisition of fixed assets, computer hardware or software is shared equally among member banks.

3.3.2.2 Participation

Only banks can be members of the BTOM. All banks that provide cheque account facilities are members of the BTOM. As of end-2010, the BTOM had a total of 41 members (the CBRT, 31 commercial banks, five development and investment banks and four participation banks).

3.3.2.3 Types of transactions

All cheque clearing transactions are carried out electronically in the BTOM. The BTOM only processes TRY cheques.

Legally, cheques must be physically presented to the clearing houses. However, to improve the efficiency of the clearing process and to avoid the risks associated with the physical delivery of cheques, a cheque truncation system was introduced in 1998. This allows cheques to be cleared without directly presenting them at the clearing house. This system is optional and currently used by 36 banks. Banks wishing to use this facility are required to sign a protocol which sets out the procedures and defines obligations in the event of any legal dispute that may arise due to the non-physical presentation of cheques.

In order to improve the efficiency of the clearing process, an electronic cheque clearing system has been in operation since September 2006.

3.3.2.4 Operation of the system

Cheques are cleared through the BTOM. Collecting banks transmit cheque information to the central computer of the clearing house around the clock. On the clearing day, information on cheques issued and received is transmitted by the banks up to 06:00. This information is stored in the central computer and sent to the drawee banks, where the cheque account is opened at 06:00. Although all member banks carry out cheque transactions electronically, five out of 41 banks also present cheques physically until 09:00 on the clearing day. Banks request provisions for cheques, and the provision results (bad cheque information) are sent to the BTOM up to 17:00 on the same day. The BTOM sends a list of daily cheque clearing results to the central bank's Ankara branch for final settlement.

In 2010, a total of 18.7 million cheques amounting to TRY 228 billion were processed through the BTOM.

3.3.2.5 Settlement procedures

The BTOM determines the net debit or credit positions for each bank on a multilateral basis. Banks are informed about the outcome by 17:00 each day immediately after the end of the provisioning time frame.

The CBRT maintains a separate settlement account for the BTOM at its Ankara branch. The final settlement of operations is carried out through this account. Debtor banks have to settle their daily clearing debt by payment from their giro deposits at the central bank's Ankara branch or via TIC-RTGS not later than 12:00 on the following business day. Once all debtor banks have paid their debts, the Ankara branch makes payments to creditor banks through TIC-RTGS; this finalises the official clearing and settlement day.

3.3.2.6 Risk management in the BTOM

The BTOM Regulations define the rules to be applied if a participant in the system fails to fulfil its obligations. If a liquidity problem arises, the CBRT is authorised to use all the participants' accounts at the CBRT. In addition, since the BTOM participants are banks and the CBRT provides a fully collateralised intraday liquidity facility to banks, BTOM participants may use this credit facility.

3.3.2.7 Pricing

The only fee is an entrance fee on joining the BTOM as a member.

4. Systems for post-trade processing, clearing and securities settlement

4.1 General overview

Takasbank is the CCP for derivatives transactions traded at the Turkish Derivatives Exchange (TurkDEX) (for Takasbank's other functions, see Section 4.3.2). There is no central counterparty in any other market. However, Takasbank is working on a project with the aim of becoming a CCP for the ISE markets.

There are two main systems for securities settlement and clearing. The CBRT securities settlement system (TIC-ESTS) fulfils the primary market settlement of Domestic Debt Notes (DDNs comprise government bonds and treasury bills), CBRT liquidity bills, over-the-counter transactions and CBRT open market transactions.

Secondary market operations are carried out mainly at the ISE, with ISE stock market trades being cleared and settled by Takasbank.

While the CBRT is the central securities depository for DDNs, the CRA performs the same function for dematerialised capital market instruments traded on ISE markets.

4.2 Central counterparties

4.2.1 ISE Settlement and Custody Bank (Takasbank)

4.2.1.1 Institutional framework

Takasbank was authorised as the clearing house for TurkDEX in 2004.²¹ As the central clearing house for all TurkDEX transactions, Takasbank conducts TurkDEX settlement transactions within the framework of central counterparty best practice, acting between counterparties whose contracts have been traded on TurkDEX. The financial responsibility of Takasbank is the amount of each party's settlement obligation. Takasbank's guarantee is

²¹ It was authorised by Resolution 48/1602 of the Capital Markets Board of 10 December 2004.

limited to the accounts opened at Takasbank and the contracts monitored in these accounts. Takasbank ensures financial adequacy and the reliability of derivatives markets through a guarantee fund²² created from clearing members' contributions and default penalty fines as well as from operational coverage²³ for open cash and/or securities positions.

Takasbank performs the following functions:

- opening trading accounts at TurkDEX;
- managing transaction collateral and the guarantee fund;
- handling accrued interest for cash collateral;
- profit/loss payment;
- executing transfers subject to special conditions (give-up); and
- margin call and default procedures.

4.2.1.2 Participation

The Turkish Derivatives Exchange offers two types of membership: direct clearing membership and general clearing membership. In current practice, all exchange members must become direct clearing members.

4.2.1.3 Account opening process

Four types of accounts can be opened with Takasbank: customer, portfolio, market-maker and global accounts. No customer may open multiple personal accounts. Stock market pricing in bond trading and position monitoring are carried out on the basis of account transactions.

4.2.1.4 Operation of the system

The settlement of TurkDEX transactions is performed at 14:30 on T+1 with accounts updated daily. Any loss incurred as a result of a transaction on TurkDEX is charged directly to the cash collateral deposited in the related account on the same day, T+0. If the total collateral drops under the trade continuity maintenance margin at the end of the update process, a margin call is made electronically to the respective clearing member. If the cash collateral value becomes negative after a loss is deducted from the collateral account, a margin call is made to bring the value of the account up to the initial amount of cash collateral, even if the current collateral is above the maintenance collateral. The account receivables are distributed on the next business day (T+1). Profit receivables of accounts subject to margin call after an account update are blocked until the margin call is completed. Any member who fails to deposit the collateral due to the related sub-account by 14:30 on T+1 is deemed to be in default without any further notification.

Deposit or withdrawal of collateral, valuation as well as account updates and fulfilment of obligations are performed on a sub-account basis. In case of default, the collateral deposited with Takasbank and the guarantee fund is used.

Margin obligations are met either by cash payment or by closing the position at TurkDEX.

Settlement transactions, except contracts subject to physical delivery, are settled in cash.

²² The guarantee fund comprises the default fines paid by participants trading on TurkDEX as well as TurkDEX membership contributions.

²³ Operational coverage consists of the initial margin deposited as collateral on an account basis.

The fulfilment of cash settlement obligations of the contracts subject to physical delivery by the last trading day (including the last trading day) is carried out within the framework of general principles of settlement. Physical delivery obligations of contracts subject to physical delivery must be fulfilled before 16:30 on T+2.

Takasbank's Treasury Department accrues the best interest possible on TRY-denominated transaction collateral held in collateral accounts as well as on TRY-denominated guarantee fund contributions.

4.2.1.5 Default procedures and risk management

Settlement obligations must be fulfilled by 14:30 on T+1. Any member not fulfilling its obligations by this deadline is deemed to be in default.

If the margin call is not subsequently fulfilled on T+1 (between 14:30 and TIC-RTGS closing time), this is considered to be a first default. The member is charged default interest equal to the highest overnight weighted average interest rate in the ISE Repo-Reverse Repo Market or the CBRT Interbank Money Market.

If the default amount is repaid on T+1 after the TIC-RTGS closing time or remains outstanding on subsequent days, this is considered as a second default. In this case, default interest of three times the highest overnight weighted average interest rate in the ISE Repo-Reverse Repo Market or CBRT Interbank Money Market is applied.

TurkDEX has established a guarantee fund based on the contributions of all clearing members for the fulfilment of settlement obligations in default situations. The contribution amount is determined by the clearing house.

4.2.1.6 Major current and future projects

Takasbank is working with the ISE and TurkDEX on the development of an infrastructure that will provide settlement services to options contracts planned to be traded in a new derivatives market to be opened in 2011. Current practice is limited to futures contracts traded on TurkDEX.

4.3 Securities settlement systems (SSS) and clearing systems²⁴

4.3.1 CBRT securities settlement system (TIC-ESTS)

4.3.1.1 Institutional framework

As an agent of the Undersecretariat of the Treasury, the CBRT is responsible for issuing and settling DDNs (government bonds, T-bills) on behalf of the Treasury. In October 2000, the CBRT began operating the electronic securities transfer and settlement system, TIC-ESTS, for the issuance and settlement in book-entry form of DDNs and other securities issued by governmental organisations.

The TIC-ESTS system provides real-time transfer and settlement of securities. With the online real-time connection to TIC-RTGS, which handles the cash-leg settlement (see Section 3.2.1), settlement of the securities and associated funds is synchronised so that DVP1 is achieved. Settlement is irrevocable.

²⁴ As Takasbank is also the clearing and settlement institution of the ISE, its two clearing roles will be described together in this section.

TIC-ESTS handles:

- primary market operations (issuance and sale of securities by the CBRT);
- secondary market operations (DVP sales between participants, transfers related to the settlement of ISE market transactions, repo and reverse repo operations);
- free transfers between the participants;
- transfers between the sub-accounts of a participant (repositioning operations);
- transfers between physical and book entry forms (rematerialisation/dematerialisation);
- redemption and coupon payment notifications; and
- online enquiry and periodic reporting facilities.

On the issuance day, the securities are created in the books of TIC-ESTS in the CBRT sub-account. They are then transferred to the participants' accounts in the context of primary market operations. Transfers resulting from secondary market operations are also conducted in TIC-ESTS. In addition, TIC-ESTS permits conversion of physical securities to electronic form and vice versa. In other words, securities in TIC-ESTS can be delivered in paper form if investors so require. Similarly, paper certificates may be entered into the electronic system once the holder physically submits them to a CBRT branch. As the fiscal agent of the Treasury, the CBRT issues securities in TIC-ESTS and makes principal and interest payments on government bonds and treasury bills.

4.3.1.2 Participation

TIC-ESTS participants are also participants in TIC-RTGS (see Section 3.2.1.2). At end-2010, there were 48 participants in TIC-RTGS and TIC-ESTS, including the CBRT.

4.3.1.3 Sub-accounts

TIC-ESTS transfers securities between the securities sub-accounts of participants. There are three types of sub-accounts: free sub-accounts, customer securities sub-accounts and collateral sub-accounts. The holdings in a participant's free sub-accounts constitute the securities directly owned by that participant. The participants segregate customer securities that are in their custody into customer securities sub-accounts.

This segregation is compulsory only for securities subject to customer-based repurchase transactions. Input to and output from collateral sub-accounts are under the control of the CBRT, and securities held in the collateral sub-accounts determine the participant's limits in the CBRT markets. The intraday liquidity limit in the TIC-RTGS system is also determined by the holdings in one of these sub-accounts within the same borrowing limits.

4.3.1.4 Operation of the system and DVP settlement

The DVP settlement procedure is initiated at the request of the seller. The TIC-ESTS system blocks the securities that are subject to the sell request and informs the buyer. The buyer responds either with a buy request for the full amount or with several buy requests to purchase the securities in tranches. The sell and buy requests are matched in TIC-ESTS. For a valid buy request, TIC-ESTS forwards a payment request to TIC-RTGS, where the funds are settled. The payment requests for TIC-ESTS settlements are treated by TIC-RTGS as ordinary payment requests from the buyer. The securities are delivered in TIC-ESTS only if the associated funds are transferred into TIC-RTGS.

4.3.1.5 Custody of DDNs in the name of customers

The TIC-ESTS system keeps a record of the securities in the name of its participants rather than in the name of end customers. However, the system allows the banks to segregate their customers' securities from their own securities.

A project has been initiated to enable the safekeeping of DDNs in the name of customers in the CRA, as is done with other capital market instruments. When the project is completed, banks and other intermediaries will transfer the DDNs they keep in custody for their customers to the CRA, where they will be registered in customers' names. Other DDNs owned by banks will reside in TIC-ESTS, but the CRA will hold details of the total holdings in each security.

In order to achieve this goal, the CRA will become a participant in TIC-ESTS. Participants in TIC-ESTS will transfer DDNs to and from the CRA system as they are sold to or bought from their customers using the TIC-ESTS infrastructure. The CRA will keep the records in the name of the customer based on information from the banks and other intermediaries. After the integration, TIC-ESTS will continue to be the major settlement system for primary and secondary market operations as before.

At the end of 2010, the project was technically and operationally ready and waiting for the regulations to be completed.

4.3.1.6 Pricing

The cash leg of operations is charged according to the TIC-RTGS tariff (see Section 3.2.1.8). On the securities leg, each message is charged at the minimum fee of the tariff, which was TRY 0.20 in 2010. The only exception to this rule is for the cancellation of securities movements. Cancellation requests are charged at double the maximum tariff, which was TRY 29.00 in 2010.

4.3.2 ISE Settlement and Custody Bank (Takasbank)

4.3.2.1 Institutional framework

Takasbank is the central settlement institution authorised by the ISE for the finalisation of cash and securities transfers relating to transactions made in current ISE markets (see Sections 1.3.2 and 1.3.3).

4.3.2.2 Participation

All CMB-certified securities intermediary institutions (brokerage houses and banks) can be members of the ISE, and ISE members are automatically entitled to be settlement members of Takasbank. The membership criteria of the ISE are stated in the relevant clauses of the Capital Markets Act and in the ISE rules and regulations.

4.3.2.3 Types of transactions

The TCS handles the clearing and settlement of both the security and the cash leg of ISE trades. Securities include stocks, exchange-traded funds, bonds and bills as well as repo transactions carried out on the ISE markets.

4.3.2.4 Operation of the system

Takasbank, as the clearing and settlement institution of the ISE, calculates and announces the net obligations of parties based on their operations in ISE markets. Net obligations are legally binding in Turkey but Takasbank does not guarantee settlement. In case of partial fulfilment of the obligation, a proportional amount of the receivable is transmitted to the buyer.

Clearing and settlement operations can be divided into two sections: government bonds and treasury bills; and stocks.

4.3.2.4.1 Government bonds and treasury bills

Clearing and settlement operations for ISE transactions in the bonds and bills market, outright purchases and sales market and repo and reverse repo market are carried out by Takasbank on a DVP3 basis. Accordingly, members do not take delivery of their receivables until they fulfil their obligations. In case of partial fulfilment of the obligation, a proportional amount of the receivable is transferred to the buyer. The settlement period for transactions is between T+0 and T+90 (value date is specified at the time of trade).

Settlement of trades in the primary market and the over-the-counter secondary market for government debt securities is realised via TIC-ESTS. Takasbank has a securities account with CBRT to facilitate the settlement of trading in government debt securities on the ISE.

In the bonds and bills market, the ISE acts as an intermediary that matches orders between the ISE bonds and bills market members. Following the execution of a trade, the ISE issues confirmations to both parties and sends an online copy to Takasbank. Information on executed trades is transferred to Takasbank in real time. Takasbank multilaterally nets all trades for each ISE member for each security traded and for cash. Net obligations, together with receivables due, are reported to the members electronically via Takasbank's proprietary system on the settlement day for bonds and bills.

Participants are required to provide settlement instructions to Takasbank before 16:30 on the settlement date through TIC-ESTS or through an account held with Takasbank. Securities are initially credited to Takasbank's account at the CBRT, and subsequently securities accounts of related parties are credited. The securities are then moved to the account of the buying party held with Takasbank. Although the deadline for settlement is 16:30, settlement is continuous throughout the processing day subject to availability of cash and securities. Only trades executed before 14:00 can be settled on the same day.

Participants are expected to fulfil their cash obligations by using their cash accounts with Takasbank by 16:30 for settlements in the bonds and bills market. Participants can transfer cash from their accounts held with Takasbank or from other accounts outside Takasbank using the CBRT's electronic funds transfer (TIC-RTGS) system or using same-day receivables from the ISE stock market or the Takasbank money market.

4.3.2.4.2 Stocks

Financial institutions operating in the ISE stock market are required to open custody accounts in the CRA (see Section 1.3.4) and fund settlement accounts in Takasbank, which clears and settles ISE-traded securities. Both the funds and securities legs of the ISE trades are settled in Takasbank. The settlement of securities and cash in the stock market is effected on T+2 and on a DVP3 basis by Takasbank.

At the end of each trading day, the ISE sends Takasbank details of all transactions that have been executed by brokerage houses during that day. On receiving these data, Takasbank multilaterally nets the settlement positions, indicates the obligations for each member in each security, and calculates their net cash positions.

The net securities settlement position on a client basis is transmitted to the CRA on the trade day (T+0). As a result, netting is made on a member basis and detailed on a client basis. Details of netting activity are made available to participants electronically on T+0, showing details of settlement amounts due. At the end of the day, the securities of the delivering clients are blocked automatically by the CRA for settlement purposes. The receipt instructions for the transfer of securities from the participant accounts to the client sub-accounts are generated within the CRA system.

On T+1, net settlement records that are checked by the CRA are made available to participants electronically. In case of a discrepancy, participants may apply to the ISE for amendment until 17:00 on T+1. The settlement records are updated according to the correct contract details.

On T+2, the securities of the delivering clients are transferred from the settlement blockage account to the settlement pool account of the participant within the CRA system. The transfer of securities from the participant settlement pool account to the Takasbank settlement pool account within the CRA system is executed by the CRA automatically. Securities are transferred to client sub-accounts by the CRA.

Members are entitled to take delivery of their receivables from settlement, prioritised according to the time when they fulfilled their obligations. If participants fulfil their obligations partially, they are entitled to a partial delivery of their receivables. Settlement can occur continuously between 09:00 and 16:00 during the processing day subject to the availability of cash and securities. These transfers occur simultaneously with the internal book-entry settlement of the netted securities positions, provided that the Takasbank settlement pool account is available.

Participants are expected to fulfil their cash obligations by using their cash accounts with Takasbank from 09:00 to 16:00 for ISE stock market settlements. Participants can transfer cash from their other accounts with Takasbank or other banks using the CBRT's electronic funds transfer (TIC-RTGS) system or same-day receivables from the ISE bonds and bills market or the Takasbank money market.

4.3.2.5 Custody function

Custody operations consist of custody and safekeeping services related to stocks, bonds, investment fund certificates and other capital market instruments, international settlement and safekeeping services provided to domestic institutions and domestic custody services provided to foreign institutions.

However, according to the Capital Markets Law and the regulations of the CMB, ISE-traded stocks were dematerialised in 2005 and the custody function for equities was transferred to the CRA. With dematerialisation, the accounts of brokerage houses with Takasbank, which holds stocks and investment fund certificates, were also transferred to the CRA including all customer sub-accounts, and all the activities in the accounts are now kept in dematerialised form in the CRA.

Besides holding dematerialised securities on behalf of the CRA, Takasbank also continues to collect the securities which are subject to dematerialisation, on behalf of the CRA.

The accounts of investment funds, investment trusts, private pension funds and exchange-traded funds continue to be kept by Takasbank in dematerialised form via book entry, and procedures relating to these accounts are executed by Takasbank in coordination with the CRA system.

Custody and safekeeping services related to debt instruments include safekeeping, transfer, physical delivery, and redemption and coupon payment services. Debt instruments are kept on the account of Takasbank held with the CBRT but the sub-balance records of debt instruments that belong to the brokerage houses are kept in Takasbank's systems.

Physical securities in customer accounts are kept in Takasbank's vaults, while dematerialised securities are kept in the sub-accounts of Takasbank accounts held with the CBRT, the CRA or similar institutions, depending on the type of security.

4.3.2.5.1 Non-fungible custody

Non-fungible custody is a safekeeping service in the name of the beneficial owner, who uses the custody service for securities that have identical denomination, rights and other

properties.²⁵ Under non-fungible custody, the securities will be returned to the beneficial owner on the same terms. Non-fungible custody services are open to stock exchange members as well as issuers and institutional investors.

Under non-fungible custody, securities need not be traded on a stock exchange. Settlement obligations cannot be fulfilled with securities held in non-fungible custody. The records of these securities cannot be kept in the details of sub-accounts of the beneficial owners.

4.3.2.5.2 Private pension fund custody services

Takasbank has undertaken the duty of custodian as stated in the Regulation on the Principles Relating to the Establishment and Activities of Pension Investment Funds.

Money market and capital market instruments within the scope of Takasbank's custody service are kept in Takasbank on behalf of private pension funds. For the safekeeping of other money market and capital market instruments, private pension companies can use custody services from another institution, with the approval of the CMB, provided that the company provides Takasbank with unrestricted access to information on the securities in question and their value.

4.3.2.6 Risk management and default procedures

4.3.2.6.1 Government bonds and treasury bills

ISE members must fulfil their obligations before the deadline (16:30 on the settlement day). If obligations are fulfilled after the deadline at 17:00, a default interest payment will be imposed of 25% of the prevailing market overnight interest rate (highest of the ISE Repo-Reverse Repo Market or the ISE Interbank Repo Market or the CBRT). If obligations are fulfilled after 17:00 but within the working hours of TIC-RTGS on the settlement date, default payment calculations are calculated on 50% of the prevailing market overnight interest rate (highest of the ISE Repo-Reverse Repo Market or the ISE Interbank Repo Market or the CBRT).

If the default is not made good on T+1 for bonds and bills, Takasbank notifies the ISE for a buy-in or sell-out, indicating the obligation due (cash or securities) and the detailed list of securities and cash receivables under pledge at Takasbank. The payment and securities obligations arising from the trade related to the buy-in or sell-out process are settled on the same day (T+1 for bonds and bills). If the value of the receivables under pledge is not sufficient to discharge the entire obligation, the member's collateral with the ISE is used to fulfil the rest of the obligation. Furthermore, the penalty payment is calculated as three times more than the prevailing market overnight interest rate applied throughout the failure period. This default penalty is executed for the first default case within a three-month period. For every additional default case within this period, the default penalty interest rate increases by 1 percentage point.

Members in a creditor position are eligible for a payment for unjust treatment with respect to the non-delivery or non-payment of cash or securities due to them. Payable on the value date, the payment is assessed at twice the overnight weighted average interest rate. For this payment to be made, the payment or delivery failure must not stem from problems occurring in the ISE, Takasbank or the CBRT system; the member in a creditor position with respect to cash/securities must have fulfilled its settlement obligations within the required settlement deadlines; and any written objection of the defaulting member must have been invalidated and default interest collected.

²⁵ Non-fungible securities with the same corporate rights.

4.3.2.6.2 Stocks

For equities settlement, the deadlines for the default procedure are:

- for securities, the deadline for the transfer from the members' settlement pool accounts to the Takasbank settlement pool account (T+2; 16:00); and
- for the cash side, the transfer deadline for cash from member accounts to Takasbank accounts (T+2; 16.00).

If obligations are fulfilled after 16:00 but still within the working hours of TIC-RTGS on the settlement date (T+2), default payment calculations are calculated on the prevailing market overnight interest rate (higher of the ISE Repo-Reverse Repo Market or the CBRT) by taking the weighted average of the market value of the stock realised in the ISE stock market's second session. If the failure persists into T+3, the penalty payment is levied at three times the prevailing market overnight interest rate and applied throughout the failure period.

Takasbank notifies the ISE for a buy-in or sell-out of settlement failures on the morning of T+3. The buy-in or sell-out process is executed at the ISE on a separate order book from the one used for normal transactions in the related equity. The payment and securities obligations arising from the trade related to the buy-in or sell-out process are settled on the same day (T+3) at the ISE. The contract details of the buy-in/sell-out process are sent to Takasbank's system and, after the settlement records are generated, they are sent on to the CRA. If the value of the receivables under pledge is insufficient to discharge the whole obligation, the member's collateral with the ISE is used to fulfil the rest of the obligation. Default payments are executed by Takasbank.

Securities obligations which are not fulfilled on T+2 are automatically settled through the CRA system on T+3. Cash obligations are settled via the Takasbank system. The receivables of members that were unable to take delivery on the settlement day are distributed on completion of the failed settlement transaction at the ISE. This operation is executed initially within the Takasbank system; a message is then sent to the CRA. After receiving this message, the CRA credits the receivables to the client's account.

The guarantee account is used in default cases when the liquidated collateral of the defaulting participant (after buy-in and sell-out at the ISE) does not cover the settlement obligation. The maximum compensation allowed is limited by the amount of the fund.

4.3.2.6.3 Guarantee account

Takasbank operates guarantee accounts with the aim of avoiding settlement delays in transactions executed on the bonds and bills market and on the stock market. The guarantee accounts protect counterparties that are unable to collect receivables as a result of the other party's failure. The account for the stock market is funded from an initial payment from the ISE and fines levied on ISE members for late payments and delayed deliveries to settlement.

The bonds and bills guarantee account is also made up of an initial payment from the ISE and the fines collected from ISE members for late payments and delayed deliveries to settlement. This account is used at the end of the settlement day if any default occurs.

The stock guarantee account is currently managed by Takasbank, and is activated every day to provide the initial liquidity for the settlement process. At the end of the settlement process, if all parties have fulfilled their obligations, the account is released in full and remunerated on market terms via Takasbank's treasury department. Otherwise, it is used to cover the failure of the buyer vis-à-vis the seller. Coverage is limited to the balance of the account. In effect, the account is a temporary source of liquidity for the settlement process.

4.3.2.7 Links to other systems

Takasbank, as a participant of TIC-RTGS and ESTS, provides ISE members with indirect access to the system through its own infrastructure. The Takasbank Electronic Transfer

System (TETS) enables securities intermediary companies, which are not eligible to become members of the national payment system as they do not have a banking licence, to transfer both cash and government bonds and bills in and out of the Takasbank system electronically and in real time. They also receive reports related to these transactions. Through TETS, securities intermediary companies can indirectly access TIC-RTGS and ESTS to transfer cash and government bonds and bills, participate in Treasury auctions, get auction results, provide collateral for bids, and make other payments quickly and cost-effectively.

The securities settlement operations are carried out via the Takasbank settlement pool account with the CRA. The CRA and Takasbank systems are fully interlinked in real time, so that securities transfers are instantaneously reflected in the CRA. Settlement is effected on the basis of information transferred from the ISE.

Custody accounts are held with the CRA; participants have a settlement pool account besides their own portfolio accounts and client sub-accounts. Cash accounts are on a participant basis and held with Takasbank.

4.3.2.8 Pricing

Takasbank charges neither an entrance fee nor an annual fee to its members. Settlement is also free of charge.

4.3.2.9 Major current and future projects

Takasbank plans to become a CCP for the ISE markets, with risk management systems to be based on SPAN software. The aim is to reduce clearing and settlement risks.

4.3.3 Central Registry Agency (CRA)

4.3.3.1 Institutional framework

The CRA is governed by the Turkish Capital Markets Law and licensed by the CMB as the central registry and depository for dematerialised capital market instruments.

The CRA's shareholders are Takasbank (65%), the ISE (30%), the Association of Capital Market Intermediary Institutions of Turkey (5%), and the Istanbul Gold Exchange (0.1%) (see Section 1.3.4).

4.3.3.2 Participation

All participant groups are subject to the requirements set out in the CRA Participation Rules. The criteria for participation are set by the CRA subject to the authorisation of the CMB, which has the authority to designate the terms and conditions for application and eligibility for membership.

The Central Dematerialised System is a direct account holding system in which participant and investor accounts are segregated. All participants can become system users and enter book-entry records in the system on behalf of investors and on their own accounts.

The CRA offers depository services to issuers, brokerage houses, banks and derivatives broker companies. CRA membership is also open to authorised foreign institutions, including clearing institutions and central securities depositories (CSDs).

As of March 2011, the total number of participants in the Central Dematerialised System was 575, comprising banks (40), brokerage houses (99), issuers of equities (342), issuers of private sector debt instruments (16), issuers of both equities and private sector debt instruments (9), issuers of mutual funds (65), issuers of warrants (1), issuers of equities and warrants (1), derivatives broker companies (1), and Takasbank (1).

4.3.3.3 *Types of transactions*

The CRA serves as the central depository for the following types of dematerialised security: equities, mutual fund certificates, exchange-traded funds, corporate debt securities and warrants. All transactions involving dematerialised capital market instruments are conducted by CRA participants on an investor account basis via the Central Dematerialised System.

4.3.3.4 *Operation of the system*

Settlement of dematerialised securities is performed in book-entry form through the Central Dematerialised System. The ISE Settlement and Custody Bank (Takasbank) acts as the clearing house and cash settlement agent for on-exchange transactions with dematerialised financial instruments. Takasbank runs two different DVP systems involving the CRA: one is for on-exchange net settlements and the other is a DVP system that covers on-exchange gross settlement transfers. The CRA processes securities transfers for both these systems and for free-of-payment (FOP) settlements. Settlement occurs on a real-time basis and transactions become irrevocable once the securities and cash are transferred into participant accounts with the CRA and Takasbank respectively (see also Sections 4.3.2.4.1 and 4.3.2.4.2).

Settlement of on-exchange transactions is executed on a T+2 cycle with near-simultaneous net settlement of securities and cash (DVP3). Foreign institutional trades within custodian-type participant accounts settle on a gross settlement system (DVP1) and also through FOP transfers of securities. Exchange-traded corporate bonds and bills are settled on the trade day (T+0).

For all the securities held at the CRA, Takasbank is the clearing agent for the cash leg of transactions.

The DVP system's operating hours for securities and cash settlements are from 09:30 to 17:00. FOP transfers can be made between 08:45 and 18:30 (or 21:00 if confirmation of counterparty is requested). Securities and cash transfers become irrevocable at the point of settlement in the CRA system, at the latest by 17:00 each day.

4.3.3.5 *Risk management*

The main means of addressing risk is through the adoption of DVP principles where settlement for on-exchange trades is on a near-simultaneous basis for securities and cash. In addition, the ISE undertakes the collection of collateral for on-exchange transactions and there is a settlement guarantee account for on-exchange equity transactions which is managed by Takasbank.

The participants' collateral with the ISE is used in case of a default that cannot be fully covered by either the participant's settlement receivables with the CRA (for Takasbank) or buy-ins/sell-outs at the ISE as per ISE regulations. As a last resort, the ISE guarantee account can be used.

The CRA provides only depository-related services such as securities transfers, corporate actions, legal transactions, reporting and investor services and does not hold any cash accounts in its system for participants or offer any credit and stock-lending services.

4.3.3.6 *Links to other systems*

Since March 2011, the CRA has maintained a direct link to the Austrian central securities depository, CSD.Austria, managed by OeKB, for the settlement of foreign equities traded on the ISE (in addition to the direct link with Takasbank for settlement of equities, etc).

According to its regulations, the CRA designates the terms and conditions of opening and maintenance of accounts at the CRA by foreign CSDs, although no such accounts have been opened so far.

4.3.3.7 Major current and future projects

The e-Governance portal, a major project now at the development stage, will improve communication through different platforms between companies, their shareholders and other investors, with a view to raising the level of corporate governance in Turkey.

Another major project, the Public Disclosure Platform–Central Dematerialised System Integration Project, will serve as the primary source of information in corporate actions notifications. Together with the CRA-Takasbank SWIFT Integration Project, the project represents the first step towards straight through processing for corporate actions operations.

As part of the Istanbul Financial Centre Project, Takasbank and the CRA are working on a new fund distribution platform for fund managers. The platform is expected to go live in 2011.

Dematerialised commodity certificates that will be traded on commodity exchanges will also be held at the CRA. The legal framework and operational infrastructure for this project are being jointly developed with other private and governmental institutions.

4.4 Use of securities infrastructure by the CBRT

The CBRT, which is responsible for issuing treasury bills and government bonds on behalf of the Undersecretariat of the Treasury, launched TIC-ESTS, an electronic securities transfer and settlement system, in 2000 (see Section 4.3.1). TIC-ESTS also provides an infrastructure for the market operations carried out by the CBRT as part of its monetary policy operations and for managing collateral.

4.4.1 Open market operations

To regulate the money supply and liquidity in the economy in the context of its monetary policy targets, the CBRT conducts open market operations against the Turkish lira, including the outright purchase and sale of government securities, repo and reverse repo transactions, issuance of liquidity bills, and lending and borrowing of Turkish lira deposits and DDNs.

The cash settlement of these transactions takes place in the banks' TIC-RTGS accounts. The securities settlement takes place in TIC-ESTS.

Open market operations can be performed in TIC-RTGS and TIC-ESTS or on the ISE.

4.4.2 Securities lending and borrowing market in the CBRT

The collateralised securities lending and borrowing market, in which the CBRT acts as a blind broker, was established in the CBRT in 2003. Only six benchmark securities, chosen by the Treasury, are eligible for lending/borrowing transactions in this market, and the transfer of loaned securities takes place through the accounts held in TIC-ESTS, as the custodian.

While primary dealers are allowed to borrow and lend, other banks can only lend securities in this market. Institutions and private investors can only lend, with banks as intermediaries.

**Payment, clearing and
settlement systems in
the United Kingdom**

Contents

List of abbreviations	441
Introduction.....	443
The payment systems.....	443
Settlement and clearing systems	443
1. Institutional aspects	444
1.1 The general institutional framework	444
The Banking Act 2009	444
Financial Services and Markets Act (FSMA) 2000	444
The Financial Markets and Insolvency (Settlement Finality) Regulations 1999.....	445
1.2 The role of the central bank	445
1.2.1 Provision of services.....	445
1.2.2 Pricing policies	446
1.2.3 Oversight.....	446
1.2.4 Participation in other forums	447
1.3 The role of other private and public sector bodies.....	447
1.3.1 The Financial Services Authority (FSA)	447
1.3.2 The Payments Council.....	447
2. Payment media used by non-banks.....	448
2.1 Cash payments.....	448
2.2 Non-cash payments.....	449
2.2.1 Non-cash payment instruments	449
2.2.2 Non-cash payment terminals (ATMs).....	451
3. Payment systems (funds transfer systems).....	451
3.1 General overview.....	451
3.2 Large-value payment systems – CHAPS	452
3.2.1 Institutional framework.....	452
3.2.2 Participation.....	452
3.2.3 Types of transaction	452
3.2.4 Operation of the system and settlement procedures.....	453
3.2.5 Risk management.....	453
3.2.6 Pricing	454
3.2.7 Major ongoing and future projects	454
3.3 Retail payment systems.....	454
3.3.1 Bacs	454

3.3.2	Faster Payments Service (FPS).....	456
3.3.3	Cheque and Credit Clearings (C&CC)	457
3.3.4	LINK	458
4.	Systems for post-trade processing, clearing and securities settlement	459
4.1	General overview.....	459
4.2	Central counterparties and clearing systems	459
4.2.1	LCH	459
4.2.2	ICE Clear Europe	461
4.2.3	Central counterparty EuroCCP	463
4.3	Securities settlement system	465
4.3.1	CREST	465

List of abbreviations

APACS	Association for Payment Clearing Services
APS	Assured Payment System
BPSL	Bacs Payment Schemes Ltd
CBM	Central Bank Money
C&CC	Cheque and Credit Clearings
C&CCC	Cheque and Credit Clearings Company Ltd
CDI	CREST Depository Interest
CFTC	Commodity Futures Trading Commission
CHAPS Co	CHAPS Clearing Company Ltd
DCO	Derivatives Clearing Organisation
DTCC	Depository Trust & Clearing Corporation
EuroCCP	European Central Counterparty
FCA	Financial Conduct Authority
FPS	Faster Payments Service
FMIRs	Financial Markets and Insolvency (Settlement Finality) Regulations 1999
FSA	Financial Services Authority
FSMA	Financial Services and Markets Act 2000
IADS	Independent ATM Deployer
IBDE	Interbank Data Exchange
ICE	ICE Clear Europe Ltd
LCH	LCH.Clearnet Ltd
LFCA	Liquidity Funding and Collateralisation Agreement
LIFFE	London International Financial Futures Exchange
LLSA	Liquidity and Loss-Sharing Agreement
LME	London Metal Exchange
NCS	Note Circulation Scheme
PPS	Protected Payment System
RCH	Recognised Clearing House
SFD	Settlement Finality Directive
TDBV	Term Delivery by Value
USRs	Uncertificated Securities Regulations

Introduction

There have been significant changes to the United Kingdom's payments, trading, clearing and settlement landscape in recent years, resulting from reform of the institutional framework, consolidation and enhancement of infrastructures, and payment innovations.

The payment systems

The four main interbank payment systems, previously operating under the umbrella of the Association for Payment Clearing Services (APACS), are now managed and operated by independent companies. These are:

- CHAPS, the United Kingdom's real-time gross settlement system operated by CHAPS Clearing Company (CHAPS Co). The infrastructure is provided by the Bank of England (the Bank).
- Bacs, a high-volume, retail deferred net settlement system operated by Bacs Payment Schemes Ltd (BPSL). It has a three-day clearing cycle and infrastructure is outsourced to a third-party service provider.
- Faster Payments Service (FPS), a retail deferred net settlement system operated by Faster Payments Schemes Limited. Launched in 2008, it runs three settlement cycles per day. The infrastructure is outsourced to a third-party service provider.
- Cheque & Credit Clearings (C&CC). Operated by the Cheque & Credit Clearings Company (C&CCC), this is a clearing for paper-based payment instructions. The volumes of this system have been in long-term decline.

Other retail payment systems include LINK, which connects the ATMs of different providers throughout the United Kingdom to enable withdrawal of cash and support a range of payment card schemes, and Visa and MasterCard (the main issuers of debit and credit cards). Electronic money (e-money) activities remain small-scale, but the number of e-money providers is increasing, offering a range of both internet-based and prepaid card schemes.

Sterling is a member currency of CLS, the global foreign exchange settlement system.

Settlement and clearing systems

CREST is the United Kingdom's securities settlement system for the holding and transfer of securities. An embedded payment system supports a delivery-versus-payment (DVP) settlement service for transactions in UK, Irish, Manx and Channel Islands securities. CREST has been operated since 2002 by Euroclear UK & Ireland (EUI), a fully-owned subsidiary of Euroclear SA. CREST also has links to settlement systems outside the United Kingdom to allow transactions in foreign securities to be settled in CREST.

The United Kingdom has four recognised clearing houses (RCH). These are:

- LCH.Clearnet Ltd: the main UK central clearing counterparty (CCP), which clears for a range of equities, fixed income, derivative and commodity markets. LCH is part of the LCH.Clearnet Group, based in Paris.
- ICE Clear Europe Ltd: acts as a CCP providing clearing services for all trades on ICE Futures Europe, all cleared OTC contracts executed in ICE's global OTC markets and a range of European credit default swap (CDS) products. These contracts include oil, gas, coal and electricity futures and options.
- EuroCCP: a wholly owned subsidiary of the Depository Trust & Clearing Corporation (DTCC). EuroCCP clears equity trades in 19 European markets. EuroCCP began

operations in August 2008 and clears trades for a number of multilateral trading facilities.

· CME Clearing Europe: newly established, this is a wholly owned subsidiary of CME Group Inc that will provide clearing services for OTC trading of energy derivatives, interest rate swaps, CDS and foreign exchange.

1. Institutional aspects

1.1 The general institutional framework

Financial regulation in the United Kingdom is carried out by the Bank of England and the Financial Services Authority (FSA), the UK supervisory agency. Both these authorities also work closely with the Treasury, as the United Kingdom's finance ministry is known. Their respective responsibilities relating to financial stability are set out in a memorandum of understanding. The roles and responsibilities of the central bank are set out in the Bank of England Act 1988 and the Banking Act 2009. The roles and responsibilities of the FSA are set out in the Financial Services and Markets Act 2000 (FSMA).

The Banking Act 2009

The regulatory framework relating to large-value payments systems in the United Kingdom is governed by the Banking Act 2009. Part 5 of the Banking Act establishes a statutory framework for the oversight of recognised interbank payment systems. The Act confers powers on the Treasury to designate, by order, a system as a "recognised inter-bank payment system" if the Treasury is satisfied that "any deficiencies in the design of the system or disruption of its operation, would be likely to threaten the stability of, or confidence in, the UK financial system, or to have serious consequences for business or other interests throughout the United Kingdom".

The Act also confers powers on the Bank of England in respect of such recognised systems. The Act allows the Bank to issue principles to which recognised systems must have regard; these broadly follow the CPSS Core Principles. The Act also provides the Bank with a set of tools to support its oversight function. These include powers to gather information, set principles, issue directions, require changes to system rules, appoint inspectors, and require the commissioning of an independent report. There are also powers of sanction for compliance failures as specified in the Act, including publishing the fact of a compliance failure, financial penalties and closure of a system. There is also a power of management disqualification.

Financial Services and Markets Act (FSMA) 2000

Under FSMA 2000, responsibility is given to the Financial Service Authority for the supervision of clearing houses and settlement systems. The regulatory status of these entities is that of recognised bodies. These entities may have payment systems embedded within them. As a consequence, the Bank of England and the FSA cooperate in the oversight of recognised payment systems that are operated by FSA-regulated entities. A memorandum of understanding facilitates effective communication and cooperation between the Bank and FSA in respect of the oversight of payment systems.

The FSA is also the prudential regulator of many participants in recognised interbank payment systems, including UK banks and the UK subsidiaries of foreign banks, and is therefore responsible for the regulation of credit, liquidity and operational risks they may incur by using such systems.

The Financial Markets and Insolvency (Settlement Finality) Regulations 1999

The Financial Markets and Insolvency (Settlement Finality) Regulations (FMIRs) 1999, which implement the EU Settlement Finality Directive in the United Kingdom, allow payment and settlement systems to apply for certain protections against the operation of normal insolvency law, ensuring that transactions that have been entered into the system are final and irrevocable, and to ensure the enforceability of collateral security. In order to receive these protections, systems must meet the criteria set out in the Settlement Finality Regulations and be designated by the relevant authority.

The Bank of England is the relevant authority for systems processing only payment transfer orders. The Bank assesses applications for designation from such systems and decides whether to designate a system on the basis of whether it meets the requirements set out in the schedule of requirements.

The FSA is the relevant authority for systems processing securities transfer orders, but consults the Bank when it receives an application for designation of a system that processes both securities transfer orders and payment transfer orders.

1.2 The role of the central bank

The Bank of England's responsibilities are set out in a statement of its two core purposes and a memorandum of understanding between the Bank, the FSA and HM Treasury, issued following the transfer of banking supervision responsibilities to the FSA in 1998. An updated memorandum was issued in March 2006.

At the Mansion House on 16 June 2010, the Chancellor announced plans to change the system of UK financial regulation. This was followed up by consultations published by HM Treasury. The proposals include the establishment of a new Prudential Regulation Authority under the Bank, a Financial Policy Committee of the Bank with responsibilities for macroprudential regulation, and a separate Financial Conduct Authority (FCA). Some of the proposals relate to wholesale financial markets and the infrastructures that support those markets. HM Government has proposed that the regulation and supervision of settlement systems and central counterparty clearing houses (CCPs) be transferred to the Bank to sit alongside its existing role in the oversight of recognised payment systems. The FCA will be responsible for regulating exchanges and other trading platform providers. The Bank will coordinate with the FCA and other relevant authorities as appropriate.

1.2.1 Provision of services

1.2.1.1 Provision of cash settlement facilities

The Bank of England acts as settlement agent for a number of domestic payment and settlement systems (CHAPS, CREST, Bacs, FPS, C&CC, and LINK) and in consequence provides settlement accounts for members of those clearings. There is, however, no general requirement for banks to hold operational accounts with the Bank. The main UK clearing companies require their members to hold settlement accounts at the Bank in order to participate directly in their clearing processes. The Bank's policy on granting settlement accounts is set out in its Settlement Accounts Policy Paper.

Institutions that belong to more than one clearing company generally maintain a single account through which their clearing obligations are settled. Since May 2006, the sterling accounts have also functioned as reserve accounts. Settlement of obligations arising between CHAPS members takes place on a gross basis and in real time across settlement accounts. Settlement between CREST banks also occurs on a real-time gross basis, although their accounts at the Bank are updated every few minutes upon receipt of end-of-cycle earmarks from the CREST system.

Settlement of other clearings takes place on a multilateral net basis, with a single net amount posted to each clearing member's account for each clearing at a specific time during the day. Regardless of the clearing to which it relates, each credit and debit applied to a settlement account is final and irrevocable from the time it is posted.

1.2.1.2 Provision of credit facilities

To facilitate efficient settlement within the high-value clearings, the Bank of England provides members of CHAPS and CREST settlement banks with intraday credit against eligible collateral via intraday repos (some of which are generated automatically within the CREST system to finance the settlement of purchases of eligible securities by settlement banks (self-collateralising repos)).

1.2.1.3 Banking activities

The Bank of England's banking operations cover a range of other activities in addition to the operation of settlement accounts on behalf of UK payment and clearing systems:

- the issuance of banknotes;
- the settlement of official operations, the management of collateral and provision of sterling reserve accounts; and
- provision of a range of wholesale banking and custody services to the UK government, national central banks, some supranational organisations.

1.2.1.4 Provision of securities settlement facilities

The Bank of England has no statutory responsibility for the establishment or operation of settlement and/or clearing systems. Since 2003 the Bank of England has not provided facilities for British government stock and money market instruments. The Bank does, however, provide settlement accounts for CREST settlement banks and effects the settlement of obligations arising between CREST settlement banks at the end of each CREST settlement cycle. The Bank also acts as a settlement bank in CREST, settling on behalf of a number of customers.

1.2.2 Pricing policies

The Bank's charging policy in respect of its general banking operations is based on the principle of fully recovering the costs of the banking services it provides.

1.2.3 Oversight

The Bank of England oversees seven recognised interbank payment systems (CHAPS, BACS, FPS, CLS, and the embedded arrangements in CREST, LCH.Clearnet Ltd and ICE Clear Europe). These systems have been recognised by HM Treasury as meeting the criteria set out in Section 185 of the Banking Act 2009.

The Bank works closely with the FSA on the oversight of CREST, LCH.Clearnet Ltd, and ICE Clear Europe, coordinating its responsibilities for oversight of the embedded payment arrangements in these systems with the FSA's responsibilities as supervisor of EUI, LCH.Clearnet Ltd and ICE Clear Europe. The Bank also participates in the international cooperative oversight arrangements for Euroclear and LCH.Clearnet Groups, the CLS system (which settles foreign exchange transactions in 17 currencies, including sterling) and SWIFT.

Further details of the Bank's oversight, as well as descriptions of developments in UK payment systems, can be found in the Bank's Payment Systems Oversight Report.

Additional information on the oversight of recognised payment systems under the Banking Act 2009 can be found on the Bank's website.

1.2.4 Participation in other forums

The Bank of England works closely with HM Treasury and the FSA to discharge its statutory responsibility for contributing to, and enhancing, the stability of the United Kingdom's financial systems. The Bank is also represented on a number of international committees and working groups organised by the ECB and the BIS, and participates in the cooperative oversight arrangements described above. Domestically, the Bank is an observer on the Board of the Payments Council and of CHAPS Co; it is a board member of Bacs and the Cheque and Credit Clearings.

1.3 The role of other private and public sector bodies

1.3.1 The Financial Services Authority (FSA)

The FSA was established in 1998 to take over regulation of the UK's financial services sector. Under FSMA 2000, the FSA was made the single statutory regulator for all regulated financial markets in the United Kingdom. The FSA's objectives are: maintaining confidence in the financial system; the protection of consumers; the promotion of public understanding of the financial system; and the reduction of financial crime. Within the scope of FSMA, the FSA is responsible for: the authorisation and prudential supervision of banks, building societies, investment firms, insurance companies and brokers, credit unions and friendly societies; the supervision of financial markets, securities listings and clearing and settlement systems; and the conduct of operations in response to problem cases affecting firms, markets and clearing and settlement systems within its responsibilities.

1.3.2 The Payments Council

The Payments Council, set up by the payments industry in 2007, is the organisation that sets the strategy for UK payments and ensures that UK payment systems and services meet the needs of payment service providers, users and the wider economy. The Payments Council has three main objectives: to develop a strategic vision for payments and lead the future development of cooperative payment services in the United Kingdom; to ensure that payment systems are open, accountable and transparent; and to ensure the operational efficiency, effectiveness and integrity of payment services in the United Kingdom.

In May 2008, the Payments Council published the National Payments Plan (NPP) setting out its agenda for the next five to 10 years. Developed after extensive consultation with the industry and users, the plan is a strategic document that outlines a vision for UK payments, explains how the needs of stakeholders will be met, and identifies the areas where the Payments Council believes that collaboration and cooperative activity can deliver benefits to all users.

The Payments Council is a voluntary membership organisation and is governed by a set of published rules and a board of directors. Organisations that are payment service providers with qualifying payment volumes can join the Payments Council as full members.

The Payments Council works closely with a number of contracted schemes. These include: BACS Payment Schemes Limited; CHAPS Clearing Company Limited; Faster Payments Schemes Limited; Cheque & Credit Clearing Company Limited; The UK Domestic Cheque Guarantee Card Scheme; LINK ATM Scheme; and The Belfast Bankers' Clearing Company Ltd.

Each scheme has entered into a contract or other formal arrangement with the Payments Council that sets out their respective rights and duties. Under the contract, schemes are

required to report to the Board. The Board can make decisions that are binding on scheme members in order to implement its strategy. This is, however, subject to a right for both the schemes and their members to apply for a formal waiver.

2. Payment media used by non-banks

2.1 Cash payments

The Bank of England has the sole right to issue banknotes in England and Wales. The Bank currently issues banknotes in four denominations – GBP 5, 10, 20 and 50 – that circulate freely throughout the United Kingdom. Three banks in Scotland and four banks in Northern Ireland retain the right to issue their own sterling banknotes. These notes must be fully backed at all times, partly by Bank of England notes or UK coin (or a combination of the two) and partly by balances in interest-bearing accounts held at the Bank.¹

The wholesale distribution and circulation of Bank of England banknotes is managed under the Note Circulation Scheme (NCS), which promotes the processing and distribution of notes by the commercial sector. To make this arrangement economically viable, the NCS allows its members (commercial banks, cash-in-transit companies and the Post Office) to hold notes in custody for the Bank within their network of cash centres. Members thus avoid much of the funding cost of the notes handled, which could otherwise make it prohibitively expensive to undertake the wholesale processing of notes. In effect, members receive off-balance sheet treatment for a significant quantity of the notes in their possession. The rules of the NCS are framed to mitigate the risks to the Bank that arise from allowing commercial organisations to hold its notes in this way, and to promote efficiency in the distribution and processing of notes so as to meet the demands of cash users.

The Bank seeks to limit the volume of notes in the wholesale distribution network to the minimum required to support the demand for notes in the economy and to sustain an acceptable quality of notes in circulation. Thus the NCS both limits the volume of notes that may receive off-balance sheet treatment, and gives members incentives to reduce the total volume of notes in the wholesale distribution system by improving the efficiency of their operations. The Bank's direct involvement in wholesale processing and distribution is limited to the issue of new notes, the withdrawal of notes superseded by new designs, and the authentication and destruction of notes that are no longer fit for circulation.

The Royal Mint meets demand by issuing coins (paid for in advance) to wholesale coin centres. Discussions between organisations involved in the wholesale processing and distribution of cash (including the NCS members, commercial banks, building societies and cash-in-transit companies) and the Bank and the Royal Mint are held under the auspices of the Payments Council Cash Services Group. This group acts as a focal point for the provision of strategic direction on cooperative (non-commercial) issues relating to cash as a component of the UK money transmission/payments industry.

At the end of 2010, the value of banknotes in circulation totalled GBP 51.1 billion.² Figures produced by the Payments Council show that, in 2010, GBP 266 billion of consumer payments was in cash (compared to GBP 264 billion in 2006). Cash accounted for 61% of all consumer payments by volume in 2010 (down from 68% in 2006).

¹ The Bank has statutory responsibility for regulating the issue of Scottish and Northern Ireland notes under Part 6 of the Banking Act 2009.

² Excluding higher-value notes used as cover for the note issuers of banks in Scotland and Northern Ireland.

2.2 Non-cash payments

2.2.1 Non-cash payment instruments

2.2.1.1 Credit transfers

The volume of paper-based credit transfers continues to decline. The total volume of interbank paper credits cleared in the United Kingdom declined from 108 million in 2006 to 61.7 million in 2010. Similarly, the total value of these transactions fell from GBP 60 billion in 2006 to GBP 32.3 billion in 2010. Paper-based credits are accompanied by cheques and/or cash and are often used for making payments to large organisations such as utility or mail order companies. Payments to individuals rarely pass through the clearings as they are usually paid into the beneficiary's own bank.

CHAPS is the main system for transferring high-value automated credits that need to be settled on a real-time basis. In 2010, CHAPS handled a daily average of 127,071 payments, with a total value of GBP 224 billion.

The vast majority of interbank electronic credits, apart from standing orders and remote banking transactions which are now processed by Faster Payments Service (FPS), are processed by Bacs; these are mainly small- and medium-value items. In 2006, Bacs processed 2.5 billion credits totalling GBP 2,584 billion. By 2010, this volume had fallen slightly to 2.44 billion credit payments totalling GBP 3,114 billion.

FPS processes only credit transactions comprising single immediate payments, forward-dated payments and standing orders. Since its inception in 2008, FPS volumes have risen from 82.7 million in 2008 to 428 million in 2010.

2.2.1.2 Direct debits

A direct debit is an instruction to a customer's bank or building society authorising the payment originator to collect varying amounts from the customer's account, provided the customer has been given prior notification of the collection amount and date. Direct debits allow the originators of payments (such as utilities and insurance companies) to collect payments automatically from bank and building society accounts. The direct debit scheme is operated by BPSL.

Under the rules of the direct debit scheme, the customer's bank or building society must (on request) make an immediate refund to the customer's account should any money be taken in error. This guarantee protects customers when the originator has not notified the customer of an amount or date change. It also protects the customer if an incorrect amount is debited or the debit occurs earlier than specified.

The volume of direct debits has been growing steadily since 2006. During 2006, there were 2,858 million direct debit payments with a value of GBP 845 billion. By 2010, volumes and values had risen to 3,229 million and GBP 948 billion respectively.

2.2.1.3 Cheques

As with paper-based credit transfers, the volume of payments cleared by cheque has been in steady decline. The use of cheques at the point of sale has fallen dramatically since the widespread introduction of credit and debit cards, but cheques are still used relatively frequently for the remote payment of bills, person-to-person payments and by businesses for business-to-business as well as business-to-person payments. Some 1.2 billion cheques were cleared in 2006 (totalling GBP 1,171 billion); by 2010 this number had fallen to 0.78 billion (with a value of GBP 761 billion).

Cheques are cleared by Cheque and Credit Clearing Company (C&CCC), which operates the Cheque and Credit Clearings (C&CC). In addition to sterling clearing, the C&CCC operates a bulk paper clearing facility for euro- and US dollar-denominated cheques

presented at UK banks. The number of payments cleared through the euro and US dollar systems is small.

2.2.1.4 Payment cards

Use of electronic funds transfer at point of sale (EFTPOS) technology has grown steadily in recent years. At the end of 2010, there were 1,252,696 EFTPOS terminals in the United Kingdom (compared with 1,023,215 in 2006) that accepted, credit, debit and prepaid cards.

Chip and PIN technology was introduced to debit and credit cards in the United Kingdom in 2004. All cards are now issued with chip and PIN technology. Since 14 February 2006, all chip and PIN cardholders must use their PIN to pay for goods (unless the retailer does not have a chip and PIN terminal). Contactless card payments were launched in the United Kingdom in 2007 enabling card payments of GBP 15 or below to be made without entering a PIN.

2.2.1.4.1 Debit cards

Visa and MasterCard are the two main debit card schemes in the United Kingdom. Visa has been issuing debit cards under different brand names since 1987; its cards are currently issued under the Visa Electron and Visa Debit brands. The SWITCH scheme was launched in October 1988, and was rebranded as Maestro by MasterCard in July 2004. The Solo brand was launched by SWITCH in 1997.

Visa Electron and Solo cards work in the same way as conventional debit cards, except that they require every transaction to be authorised online, regardless of value. This has widened the range of users, particularly to younger customers and holders of investment and savings products. Maestro, Solo and Visa branded cards can be used at EFTPOS terminals and remotely (by phone, mail or internet). Solo and Visa Electron are primarily domestic schemes.

At the end of 2010, 79.9 million Visa Debit and Electron cards were in use, up from 43.7 million in 2006. Some 4.8 million Maestro cards were issued by UK banks and building societies, down from 24.9 million in 2006.

The total volume of debit card purchases has risen markedly in recent years, reaching 6.4 billion payments in 2010. The number of debit card transactions is now approximately three times the number of credit card transactions. The value of the average domestic debit card purchase in 2010, at GBP 46, is lower than that of the average credit card payment, at GBP 59.

2.2.1.4.2 Credit and charge cards

Although MasterCard and Visa are the main credit card schemes operating in the United Kingdom, American Express and Diners Club International also operate in the country. Credit cards typically fall into three categories: standard cards, issued to anyone over 18 (subject to acceptance); premium cards (which carry extra benefits and rewards and generally have stricter requirements); and charity/affinity cards (which are issued on behalf of charities or other organisations and generate a donation to the charity/organisation when the card is issued and/or each time the card is used). Cardholders may pay off the full amount of the balance, or they may choose to pay a portion of the total amount outstanding (usually subject to a monthly minimum).

The two largest charge card companies in the United Kingdom are American Express and Diners Club International; some banks also issue Visa and MasterCard branded charge cards. Charge cards require the balance to be paid off in full each month. Most charge card companies also offer reward schemes; in return for providing these an annual fee is usually levied.

At the end of 2010, some 55.6 million credit and 6.6 million charge cards were in issue, compared to 69.5 million and 5 million respectively in 2006. Total spending on charge and credit cards amounted to GBP 136.3 billion during 2010.

2.2.1.4.3 Prepaid cards

Prepaid cards are a small but growing segment of the UK card market. The majority of prepaid cards are closed-loop gift cards, which can only be used at certain retailers. Visa and MasterCard are increasing their presence in the open-loop market; these cards provide access to funds at multiple points of sale and include ATM functionality. The prepaid card market is being led by banks not historically associated with the issuance of mainstream credit and debit cards.

2.2.1.4.4 Retailer cards

Some retailers issue their own in-store cards. These typically only serve one store group and some operate on the basis of a monthly subscription and a revolving credit facility. Other retailer cards operate in the same way as prepaid or bank charge cards.

2.2.1.4.5 Postal instruments

Cashless payments can also be made through the Post Office. Small-value payments can be made using postal orders, which are particularly convenient for those who do not have access to a bank account.

2.2.2 Non-cash payment terminals (ATMs)

At the end of 2010, more than 63,000 ATMs were in operation in the United Kingdom, compared with around 60,500 machines at the end of 2006. Ownership of ATMs is split between banks and building societies and non-financial organisations known collectively as independent ATM deployers (IADs). Of the ATMs in the United Kingdom, 57% are operated by banks and building societies, and 43% are operated by IADs. All ATMs are connected via the LINK network.

In addition to cash withdrawals, LINK transactions include balance enquiries and in most cases customers can also change their PIN. ATMs operated by banks and building societies may also allow their own cardholders to produce mini-statements, make bill payments, transfer money between accounts, and request statements or new cheque books.

Around 20,000 ATMs are located at bank or building society branches. There has been a trend towards the installation of ATMs in so-called remote locations such as supermarkets and convenience stores, social and leisure centres, motorway service stations, railway stations and post offices.

3. Payment systems (funds transfer systems)

3.1 General overview

This section provides a detailed description of the recognised interbank payment systems: CHAPS, Bacs and FPS. Also included are descriptions of Cheque & Credit Clearings and LINK.

CHAPS is an RTGS system designed primarily for high-value payments, although there is no lower (or upper) limit on the value of payments. Of the more retail-orientated systems (Bacs and the C&CC) deal with high volumes of relatively small-value payments, although they can also accommodate large-value transfers. Both these clearings operate on a three-day

processing cycle and are unsuited for use by wholesale financial markets that settle higher values. As a result, the average value of transactions in these clearings is much smaller than those processed in CHAPS. FPS is a near real-time system used primarily for low-value immediate payments (internet and telephone banking); volumes are significantly lower than in Bacs and C&CC. The average value of payments passing through these systems in 2010 ranged from GBP 385 in FPS to GBP 1.7 million for a CHAPS payment.

The rules governing the operations of each interbank payment system are determined by the scheme. Any institution wishing to apply for membership of the system must meet the scheme's technical and operational requirements and agree to pay the costs associated with their membership. An applicant must also obtain explicit agreement from the Bank of England to provide settlement account facilities for the purpose of settling obligations resulting from these systems.

3.2 Large-value payment systems – CHAPS

CHAPS started operating in 1984 as a nationwide electronic interbank system for sending irrevocable, guaranteed and unconditional sterling credit transfers from one settlement member to another for same-day value. It originally operated on the basis of end-of-day multilateral net settlement between members across accounts at the Bank of England. In April 1996, it was developed into an RTGS system. It now handles nearly all large-value same-day sterling payments between banks.

Prior to 2008, CHAPS Euro provided settlement for euro-denominated payments. Following the Bank's decision not to join TARGET2, CHAPS Euro closed on 16 May 2008. Former CHAPS Euro members and their customers now effect their TARGET payments in euro via another country's system.

3.2.1 Institutional framework

CHAPS is the United Kingdom's large-value sterling payments system, settling GBP 234 billion between January and September 2010. The scheme is run by the CHAPS Clearing Company (CHAPS Co) and payments are processed by the RTGS system run and owned by the Bank of England. The CHAPS Company is member-owned, each member holding one share in the company. A memorandum of understanding between the Bank of England and CHAPS Co sets out the services which RTGS will provide as well as the service levels expected. In 2000, CHAPS was designated under the Financial Markets and Insolvency Regulations 1999 (FMIRs). CHAPS is a recognised interbank payment system under Part 5 of the Banking Act 2009.

3.2.2 Participation

CHAPS is a highly tiered payment system. There are 17 direct members of CHAPS (as well as the Bank of England and CLS Bank). Direct members operate as correspondent banks for other banks, processing payments on their behalf. Membership criteria for CHAPS are set out in the CHAPS Rules and are also available on the CHAPS Co website.

3.2.3 Types of transaction

CHAPS processes clean sterling payments in real time. There are no restrictions on the type or value of transactions in CHAPS. The payer (ie the settlement bank) must have sufficient liquidity in its settlement account in RTGS before the payment can be made. The majority of CHAPS transactions (by value) relates to large financial transactions, either between banks or between banks and corporates. Some retail transactions such as house purchases also go through CHAPS. CHAPS is also used for sterling pay-ins and pay-outs related to CLS

transactions and for transfers to and from the concentration bank in relation to LCH margin payments.

3.2.4 Operation of the system and settlement procedures

CHAPS is open for business on each day from 06:00 to 16:00 for customer payments, and then for a further 20 minutes for interbank (funding management) payments.

CHAPS payment instructions are routed via SWIFT to the RTGS system and settled individually across settlement accounts at the Bank of England. All messages are subject to authentication and encryption as provided by SWIFT. Once the payment is settled in RTGS (sending bank debited, receiving bank credited), a confirmation message is returned to SWIFT and the entire payment message is then forwarded to the receiving bank. Finality of the funds transfer between sending and receiving banks is achieved at the moment the payment is settled across the books of the Bank of England.

The Bank provides the Enquiry Link, which allows members to interact with the RTGS system so that they can monitor payments progress and manage payments in the centralised queue.

If a member submits a payment but has insufficient funds for it to settle, the message is queued within the RTGS processor until liquidity becomes available. If payments queues build up, “circles” processing can be used, whereby offsetting payments are settled on a “simultaneous gross” basis as distinct from netting. This is a useful mechanism to address situations where there may be insufficient liquidity to allow each payment in a given set to settle sequentially, but where the available funds would permit these to be settled collectively. While this facility may help to prevent blockages (gridlock), it is not used routinely during a typical day, as CHAPS members have access to additional intraday liquidity to ensure that all payments can be made.

If RTGS were to become inoperable at both its primary and recovery site for a substantial period of time, a bypass mode offers the main contingency option. In bypass mode, the settlement of payment messages does not take place in real time. Messages are delivered directly between sending and receiving members without copying any details to the RTGS system. Members provide CHAPS with agreed bilateral positions and CHAPS then calculates multilateral net settlement positions. These positions are then forwarded to the Bank for settlement.

3.2.5 Risk management

The design of CHAPS means that credit risks do not arise during the course of normal operations. Payments are made in real time and are both irrevocable and final at the point at which the relevant member’s settlement account is debited. A member cannot make a CHAPS payment unless it has sufficient funds available on its RTGS settlement account with the Bank of England. Members can use balances held with the Bank on their reserve accounts to fund payments. If members require further liquidity, the Bank provides collateralised intraday liquidity.

The main form of financial risk associated with CHAPS is liquidity risk. To aid liquidity management, all members have real-time information on their balances and the status of payment messages via the Enquiry Link with the Bank. Both centralised and individual members’ schedulers enable members to manage the order in which payments settle; the majority of members use their internal schedulers. Throughput guidelines are used to help prevent liquidity hoarding.

3.2.6 Pricing

Settlement members pay an annual charge to CHAPS Co to cover their share of the system's operating costs. The charges are kept to a minimum consistent with the adequate provision of services and the recovery of all operating costs. The Bank of England charges a per-item tariff in respect of each CHAPS transfer settled using the RTGS processor. The Bank also charges a yearly account management fee.

3.2.7 Major ongoing and future projects

CHAPS Co and the Bank of England have undertaken extensive analysis on possible liquidity-saving mechanisms to implement within CHAPS that would reduce liquidity costs. CHAPS Co and the Bank are considering whether to proceed with the development of a generic RTGS system that would be offered by SWIFT. This would be used instead of the RTGS bypass mode in the event that both of the Bank's RTGS sites failed.

3.3 Retail payment systems

3.3.1 Bacs

3.3.1.1 Institutional framework

Bacs is the United Kingdom's largest retail payment system by volume, providing automated clearing house (ACH) services for bulk clearing of electronic transfers in both debit and credit form. Bacs Payment Schemes Ltd (Bacs) is responsible for the Bacs Direct Credit and Direct Debit payment instruments. Processing of these payment instruments is outsourced to VocaLink Ltd, a member-owned third party. Bacs has been recognised by HM Treasury for oversight by the Bank of England in accordance with Section 185 of the Banking Act 2009. In 2005, the scheme was designated under the FMIRs.

3.3.1.2 Participation

Sixteen financial institutions are members of Bacs, including the Bank of England and one building society. These credit institutions are responsible for settling all settlement obligations arising from the Bacs clearing process. Direct members must meet the criteria set out by Bacs.

Direct members are able to sponsor other organisations as indirect users of the Bacs payment system. Indirect users are allocated a user number by their sponsor and can submit payment instructions directly to the central infrastructure. The indirect users of the system include a wide range of commercial and public sector bodies. There are also 743 Bacs-approved bureaux that submit transactions through Bacs on behalf of third-party users.

In 2005, Bacs introduced a class of membership known as affiliate status. Affiliate status allows stakeholders to contribute views to the Bacs board on issues without taking on operational and settlement responsibilities. There are currently 40 affiliate members.

3.3.1.3 Types of transaction

Bacs processes sterling-denominated direct debits and Bacs direct credits. Bacs previously processed standing orders; however, these instruments recently migrated to the Faster Payments Service. Although there is a limit of GBP 20 million on the value of individual payment instructions submitted via Bacs, in practice the vast majority of payments processed are of much lower value.

A high proportion of the transfers handled represent regular disbursements such as wages, pensions, utility bill payments, insurance premiums or subscriptions. Various payment types

can be accommodated, and there is no general restriction on the purpose of the underlying transaction.

3.3.1.4 Operation of the system and settlement procedures

Users submit payment instructions through Bacstel-IP, a bespoke submission channel. Some of the major users of Bacs (primarily direct recipients of transactions) use direct high-speed links (ETS or STS). Bacs has established common standards for the format in which payment information is supplied to the central infrastructure. Users can submit payment instructions between two and 71 days ahead of the payment date.

Payments submitted to Bacs are subject to a three-day clearing and processing cycle. The deadline for the receipt of payment instructions from users is 22:30 on Day 1 of the cycle. Data submitted throughout the day is validated and sorted into bank order by the central infrastructure to be transmitted onwards to the destination. The destination bank may be either a receiving bank or paying bank, depending on whether the transaction is a direct debit or direct credit. Processing of input transactions should be completed by 06:00 on Day 2. On Day 3, transfers are debited/ credited to the respective payer/payee accounts, usually at the beginning of the operating day.

The interbank obligations that arise in Bacs are settled at the Bank of England on a multilateral net basis on Day 3 of the clearing cycle. Settlement occurs at 09:30 daily through the posting of multilateral net settlement positions directly to the settlement accounts using the RTGS processor.

3.3.1.5 Risk management

Each direct member is responsible for settling payments generated by itself and the users it sponsors. There is no system of limits or other controls enforced by the central infrastructure to inhibit the volume and value of payments for which a particular settlement member is responsible. Each member may, however, set individual item and account limits. Depending on the type of payment, these may generate actionable referrals. An actionable referral requires a positive action from the user before the payment will be processed. The ability of a user to initiate Bacs transfers, and the arrangements for funding the resultant position, are matters to be decided bilaterally with the user's settlement bank.

In 2005, Bacs and its members introduced a legally binding loss-sharing agreement, the Liquidity Funding and Collateralisation Agreement (LFCA), to ensure that settlement can be completed in the event of a member defaulting on its obligation to other members of the payment system.

Currently, separate LFCAs cover both Bacs and the C&CC and they are designed to cover the position of the largest direct member in default. All direct members are obliged collectively to provide liquidity to fund the shortfall created by any default up to a limit determined by reference to average net debit positions of the direct members over the previous 12 months.

Each member also pledges collateral; the amount of collateral pledged by the direct members has a limit determined by reference to the highest net debt positions of the direct members over the previous 12 months. In the event of a default, collateral pledged by the defaulter is used to reimburse the survivors in full or in part for the liquidity provided.

3.3.1.6 Pricing

Bacs levies an item charge on its members to recover processing and other service costs. Sponsoring banks negotiate independently with users and other customers the charges these counterparties will incur as a result of generating transfers or receiving credits through the payment system. Bacs' rules require the direct members to meet the system's operating expenses through payment of an annual fee.

3.3.2 Faster Payments Service (FPS)

3.3.2.1 Institutional framework

FPS is an automated retail clearing and settlement system for credit transactions to households and corporates in the United Kingdom. It is managed by Faster Payments Schemes Limited with processing of payment instructions outsourced to a third-party service provider, VocaLink Ltd. FPS has been recognised by HM Treasury for oversight by the Bank of England in accordance with Section 185 of the Banking Act 2009. In 2010, FPS was designated under the FMIRs.

3.3.2.2 Participation

The direct members of FPS (settlement banks) are also shareholders in CHAPS Co. At present 10 financial institutions are direct members, and they are responsible for settling payment obligations arising in FPS.

FPS has the functionality to allow other participants, sponsored by a direct member, to input transactions directly into the central processing infrastructure; the direct member remains responsible for end-of-cycle settlement with other members. There is only limited participation in FPS via such functionality.

3.3.2.3 Types of transaction

FPS processes sterling credit transactions in the form of single immediate payments, forward-dated payments, or standing orders. All individual payments are subject to a limit of GBP 100,000, although this may rise over time. Approximately half of transactions are standing orders, being regular disbursements for payment of wages, utility bills, donations to charities etc, or future dated payments. Other transactions are generated via telephone or internet instructions, covering a broad range of retail transaction types. Payments can also be transmitted in bulk by banks or corporates, and are split for settlement by the central infrastructure.

3.3.2.4 Operation of the system and settlement procedures

FPS operates on a 24 hours a day, seven days a week basis. Payments are submitted to the central infrastructure (operated by VocaLink) in either single payment or bulk form. All payment messages conform to the ISO 8583 standard, except those bulk payments submitted via the "direct corporate access" channel, which utilises the bespoke format used for Bacs payment messages.

FPS is a multilateral deferred net settlement system. There are three interbank clearing cycles each working day, settling at 07:15, 13:00 and 15:45. Settlement occurs across accounts held by direct members in the RTGS system at the Bank of England.

3.3.2.5 Risk management

Individual transactions are subject to a limit, currently GBP 100,000, and each member's net debit settlement position is also subject to a cap (the "Net Sender Cap"). The cap for each member is determined by formula; once a cap is reached a member can no longer send payments until its net position recedes (ie until it receives payments) or settlement occurs.

All member banks are party to a liquidity and loss-sharing agreement (LLSA), a binding contract to ensure that settlement can be completed in the event of a member defaulting with unsettled obligations to other members of FPS. It is designed to cover the largest single Net Sender Cap, and members commit liquidity up to this level to ensure settlement can take place. Each member also pledges collateral (held in trust by the Bank of England), with the total amount of collateral pledged equal to the largest Net Sender Cap. In the event of a member's default, that member's collateral would be realised to repay liquidity provided by surviving members in part or in full.

3.3.2.6 Pricing

FPS operates on a cost recovery basis. Members pay a fee to CHAPS Co to join FPS and an annual charge to cover their share of the scheme's operating costs. VocaLink charges members a connection fee as well as monthly fees to maintain the connection to the central infrastructure. Processing costs are recovered by VocaLink from members through a per-item charge.

Sponsoring banks negotiate independently with users and other customers the charges these counterparties will incur as a result of generating transfers or receiving credits through the payment system.

3.3.3 Cheque and Credit Clearings (C&CC)

3.3.3.1 Institutional framework

The Cheque and Credit Clearing Company is the non-profit industry body that has managed the cheque clearing system in England and Wales since 1985 and in all of the United Kingdom since 1996. The clearing of sterling and euro cheques in Northern Ireland is managed by the Belfast Bankers' Clearing Company. C&CCC is not a recognised interbank payment system under the Banking Act 2009. Both the cheque clearing and the credit clearing are designated under the FMIRs.

3.3.3.2 Participation

C&CCC has 10 direct members. There is no requirement to participate in all four of the clearings operated; the euro debit clearing has 10 members and the US dollar clearing only five. Other banks and building societies can access the clearings through agency arrangements with direct members; 400 banks and building societies currently participate indirectly.

3.3.3.3 Types of transaction

The C&CCC system processes paper debit items (ie cheques) and credit items (ie bank giro transfers). C&CCC processes sterling and euro, as well as US dollar debits, for which it took over responsibility in January 2010. Cheques processed through the cheque clearing and paper credits passed through the credit clearing must meet the physical specifications (relating to layout and paper specifications) laid out in the standards of the relevant clearing. There are, however, no restrictions on the value of individual transfers or on the economic nature of the transaction.

3.3.3.4 Operation of the system and settlement procedures

The cheque and credit clearings both operate on a three-day payment and settlement cycle. In the case of the cheque clearing, a cheque presented to a member bank during banking hours will be sent to that bank's clearing centre at the end of the working day (T+0), and will arrive late that night or early on T+1. Cheques are evaluated and processed at the clearing centre and the codeline of the cheque and amount are transmitted over the Interbank Data Exchange (IBDE) network to the relevant paying bank by 11:00 on T+1. In parallel, cheques are parcelled up and sent to a clearing exchange centre, where they are passed to the paying bank later in the morning on T+1. The majority of banks have chosen to outsource their processing to third-party service providers. Where the collecting and paying banks use the same processor, the cheque need not pass through a clearing exchange – provided that this arrangement (between two members) is registered with C&CCC as a direct exchange.

On T+2, C&CCC calculates the multilateral net amounts for each of the direct members. Settlement of the sterling clearings takes place at the Bank of England across settlement accounts using RTGS. Settlement of the euro clearing takes place across an account at a

commercial bank. US dollar cheques (drawn on a UK bank) are settled using one of the five members of the clearing as a settlement service provider on a rotational basis.

Paper credits follow a reverse process to cheques, in which the collecting bank is generally the payer's bank. The processing procedures for the credit clearing are very similar to those employed in the cheque clearing. However, pre-printed codeline details on credits are not transmitted over the IBDE network.

Changes known as 2-4-6 came into force at the end of November 2007. These changes set a maximum time line of two, four and six working days for each of the stages after paying in a cheque to a current or basic bank account. Interest is received from T+2, the amount can be withdrawn from T+4, and certainty that the money cannot be reclaimed without consent is provided at the end of T+6.

3.3.3.5 Risk management

No system of limits or other controls is imposed by the C&CCC to restrict the volume or value of payments for which a particular member is responsible. In May 2005, the C&CCC and its members implemented a legally binding loss-sharing agreement to ensure that settlement can be completed in the event of a member defaulting on its obligations to other members of the payment system. This LFCA covers both Bacs and C&CC. A description of the LFCA arrangements can be found in Section 3.3.1.5.

3.3.3.6 Pricing

The C&CCC does not impose a per-item charge on cheques or credits handled; its costs are met through direct contributions by shareholders (the settlement members). Banks negotiate charges with their business customers for processing debits and credits arising from paper instruments; most banks do not impose such direct fees on their personal customers.

3.3.4 LINK

3.3.4.1 Institutional framework

The LINK Scheme is an unincorporated association of members. The Scheme sets the rules and is responsible for the day-to-day management of the ATM network. Provision of the central infrastructure and processing services has been outsourced to a third-party service provider, VocaLink Ltd.

3.3.4.2 Participation

The LINK Scheme currently has 38 members; most of these are banks and building societies, although there are also currently 11 non-financial institution members who operate ATMs but do not issue cards.

3.3.4.3 Types of transaction

LINK is the United Kingdom's largest ATM network, enabling its members' customers to withdraw cash from almost all of the United Kingdom's ATMs, irrespective of the bank at which they hold their account. The primary use of the LINK network is to withdraw cash, but the system also supports other services such as balance enquiries and mobile phone top-ups.

3.3.4.4 Operation of the system and settlement procedures

LINK is a deferred multilateral net settlement system, with a two-day clearing cycle. The LINK infrastructure retains a record of transactions conducted on T+0 and calculates net settlement obligations. These are passed to the Bank of England for settlement across settlement accounts using RTGS.

3.3.4.5 Pricing

VocaLink Ltd applies an annual tariff to the direct members of LINK to recover processing and other service costs. The LINK network allows both free and “pay-to-use” cash machines, but sets rules on charging and transparency of charging that apply to all cash machine and card issuers.

4. Systems for post-trade processing, clearing and securities settlement

4.1 General overview

This section provides a detailed description of the central counterparties LCH, ICE Clear Europe and Euro CCP, and the securities settlement system, CREST.

LCH clears a broad range of asset classes comprising securities, equities, derivatives, financials and commodities contracts traded on major exchanges such as LIFFE, LME and LSE and on various MTFs. LCH also clears a number of OTC contracts, most notably interest rate swaps and sovereign bonds and repos. ICE Clear Europe acts as central counterparty for trades on the ICE Futures Europe energy exchange, OTC energy contracts and corporate single-name and index credit default swaps. Euro CCP clears cash equity products for a number of MTFs.

As the securities settlement system, CREST settles the purchase, sale, loan and repo of UK and Irish equities and UK government and corporate debt.

4.2 Central counterparties and clearing systems

4.2.1 LCH

4.2.1.1 Institutional framework

LCH.Clearnet Ltd is part of the LCH.Clearnet Group. The Group was formed in December 2003 at the time of the merger between the LCH and the French-based CCP, Clearnet. LCH.Clearnet Ltd is a UK-incorporated company. It aligned its ownership in 2009 so that it is now 83% owned by users and 17% by the exchanges for which it clears.

LCH.Clearnet Ltd is regulated in the United Kingdom by the Financial Service Authority as a recognised clearing house under FSMA 2000. In addition, LCH.Clearnet Ltd is designated under the Settlement Finality Regulations (SFD). On 5 January 2010, HM Treasury recognised the embedded payment arrangements within LCH.Clearnet Ltd as an “inter-bank payment system” under Part 5 of the Banking Act 2009, giving the Bank of England statutory responsibility for overseeing it. The Bank and the FSA have a memorandum of understanding regarding the oversight of payment systems that covers LCH.Clearnet Ltd’s embedded payment arrangements.³

4.2.1.2 Participation

LCH.Clearnet Ltd provides clearing services for a variety of members, comprising financial institutions, brokers and corporations. To transfer payments from member accounts to its

³ LCH.Clearnet Ltd is also a “Derivatives Clearing Organization (DCO)” in the United States and subject to Commodity Futures Trading Commission (CFTC) rules and the US Commodity Exchange Act.

own accounts, LCH.Clearnet Ltd uses the Protected Payment System (PPS), which is a network of commercial payment banks (PPS banks) that provide accounts to LCH.Clearnet Ltd and its members, as well as concentration banks where LCH.Clearnet Ltd holds funds intraday. LCH.Clearnet Ltd's concentration banks are the Bank of England for sterling and euro transactions, Citibank and Bank of New York Mellon for US dollar transactions and HSBC for transactions in minor currencies.

4.2.1.3 Types of transaction

LCH.Clearnet Ltd acts as a central counterparty for: OTC cash and repo trades in European government bonds ("RepoClear"); OTC interest rate swaps ("SwapClear"); non-deliverable forwards ("ForexClear"); equities-based trades and contracts for difference, eg LSE, SIX Swiss Exchange, BATS Europe, Equiduct and Plus Markets Group ("EquityClear"); financial, equity and commodity derivatives traded on LIFFE, EDX, LME and OTC; and freight, energy and emissions contracts traded on Nodal and OTC..

4.2.1.4 Operation of the system (embedded payment arrangements)

LCH.Clearnet Ltd transfers cash (margin and cash settlement sums) to and from its members through the PPS banks. In each currency, there is a concentration bank with which LCH.Clearnet Ltd holds an account. The concentration bank is used to collect surplus funds from each of the other PPS banks and to send these funds to PPS banks where LCH.Clearnet Ltd has a net debit position. The concentration bank account is also used to send and receive funds to/from LCH. Clearnet Ltd's investment counterparties.

LCH.Clearnet Ltd calculates initial and variation margin overnight and calls/pays margin due from and to its members every day early in the morning. LCH.Clearnet Ltd routinely calls intraday margin in response to movements in the prices and positions traded. SWIFT messages are used to transmit details of margin requirements between LCH.Clearnet Ltd and members' PPS banks. The transfer of funds is made in two stages; first, PPS banks confirm to LCH.Clearnet Ltd that they are willing to make a payment, and make a book entry debiting the member's account and crediting that of LCH.Clearnet Ltd. Secondly, the PPS banks transfer funds to the concentration bank within two hours for early morning calls and within one hour intraday.

LCH.Clearnet Ltd does not play a role in the matching of trades. LCH.Clearnet Ltd accepts trades directly from organised trading platforms, via a settlement system or through OTC trade registration facilities provided by the clearing house. Depending on the source of the trade registered for clearing, LCH.Clearnet Ltd accepts trades through open offer (as with cash equity trades executed on the London Stock Exchange) or through novation (as with OTC trades registered for clearing).

4.2.1.5 Risk management

To limit the risk LCH.Clearnet Ltd accepts by acting as a central counterparty, namely the losses it could potentially incur if one of its members were to default, LCH.Clearnet Ltd applies membership requirements, collects initial and variation margin and maintains a default fund.

To reduce the probability of a member default, LCH.Clearnet Ltd sets and monitors requirements for its members. These requirements may vary depending on the type of membership and the markets (products) the member wishes to clear. The requirements include minimum levels of financial resources and creditworthiness, and adequate operational capacity.

As mentioned above, LCH.Clearnet Ltd calculates initial margin and variation margin on all positions it clears using a number of different margin methodologies. Initial margin requirements are calculated using margin models that are tailored to the risk characteristics of the market cleared, and include both industry-standard methodologies (such as SPAN for

exchange-traded derivatives) and proprietary methodologies (such as PAIRs for interest rate swap products). All cleared positions are subject to a mark to market variation margin on at least a daily basis. LCH.Clearnet Ltd can and does make both routine and ad hoc intraday margin calls, subject to a minimum transfer threshold. LCH.Clearnet Ltd regularly backtests the intended coverage.

LCH.Clearnet Ltd holds a single default fund, which can be applied to default losses arising from any of the markets it clears. The default fund is sized to be adequate to cover, at a minimum, the greater of the simultaneous default of the member that presents the largest credit risk to LCH.Clearnet Ltd and the five members with the lowest credit rating or the second and third members presenting the largest credit risk and the five members with the lowest credit rating, in extreme but plausible market conditions. The adequacy of the default fund is tested daily against end-of-day positions using historical and theoretical scenarios.

Under the provisions of its default rules, LCH.Clearnet Ltd has broad discretion to determine when a member is in default. Should a member be placed in default, LCH has the authority to close out or transfer the defaulter's contracts, realise the defaulter's collateral or perform any other action required to manage the default. LCH has an internal default management framework as well as a detailed operational procedures manual to assist in the process of managing default-related issues.

On a daily basis LCH.Clearnet Ltd forecasts its likely liquidity needs, both on an ongoing "business as usual" basis and in the event of the default of the member that presents the largest liquidity risk to LCH.Clearnet Ltd. This possible liquidity requirement is compared to the level of the liquidity LCH.Clearnet Ltd could make available if required.

LCH.Clearnet Ltd has a treasury investment policy to determine how members' collateral is managed and any resulting risks mitigated. The vast majority of cash is secured, and the policy outlines minimum credit rating criteria for LCH.Clearnet Ltd's counterparties, concentration limits at the counterparty group level, diversification of assets, and criteria to mitigate interest rate risk. Non-cash collateral is held mainly at two European CSDs, and one custodian bank in the United States.

Risks in the embedded payment arrangements are managed by setting minimum criteria for PPS banks and by defining procedures to ensure that payment deadlines are met. Concentration in a central bank account reduces exposure to intraday credit risk.

4.2.1.6 Pricing

LCH.Clearnet Ltd is a user-owned, constrained-for-profit organisation. It does not pay out dividends but uses excess profits for future fee reductions.

4.2.2 ICE Clear Europe

4.2.2.1 Institutional framework

ICE Clear Europe is owned by IntercontinentalExchange (ICE), a US company founded in 2000. ICE is a publicly traded company listed on the New York Stock Exchange. In June 2001, ICE acquired the International Petroleum Exchange (IPE), which is now ICE Futures Europe. ICE Clear Europe was launched in 2008 to clear trades for ICE Futures and the ICE OTC Energy market operated by ICE. ICE Clear Europe began clearing euro-denominated CDS in July 2009.

ICE Clear Europe is regulated in the United Kingdom by the FSA as a recognised clearing house under FSMA 2000. In addition, ICE Clear Europe received Settlement Finality Designation from the FSA under the Financial Markets and Insolvency (Settlement Finality) Regulations 1999. On 24 February 2010, HM Treasury recognised the embedded payment arrangements within ICE Clear Europe as an "inter-bank payment system" under Part 5 of the Banking Act 2009, giving the Bank statutory responsibility for overseeing it. In the United

States, ICE Clear Europe has also been granted an order as a “Derivatives Clearing Organization” by the US Commodity Futures Trading Commission. Subject to compliance with certain conditions, ICE Clear Europe has been granted an exemption from the US Securities and Exchange Commission in respect of its CDS clearing service.

4.2.2.2 Participation

In December 2010, ICE Clear Europe had 57 members, mainly financial institutions and energy companies. Payment arrangements are provided by six APS banks. ICE Clearing Europe’s concentration bank is JP Morgan.

4.2.2.3 Types of transaction

ICE Clear Europe acts as central counterparty for trades made on the ICE Futures Europe energy exchange, OTC energy contracts, and corporate single-name and index credit default swaps. The energy and CDS clearing operations have separate membership criteria, rules and risk models.

4.2.2.4 Operation of the system

(Embedded payment arrangements)

ICE Clear Europe transfers cash (margin) to and from its members through a mechanism known as the Assured Payments System (APS). The APS consists of a network of six commercial banks that provide accounts to both ICE Clear Europe and its members in one or more of the currencies in which liabilities are incurred. ICE Clear Europe members must open accounts in two of the following currencies: sterling, euros and US dollars. JP Morgan, with which ICE Clear Europe also holds an account, acts as a concentration bank for each currency. The concentration bank accounts are used to collect funds from each of the APS banks and send funds that are surplus to ICE Clear Europe margin requirements directly to clearing members.

ICE Clear Europe calculates initial and variation margin overnight and calls/pays margin due from and to its members every day early in the morning. ICE Clear Europe calculates initial and variation margin requirements every five minutes during the day and can call intraday margin in response to movements in the prices and positions traded. SWIFT messages are used to transmit details of margin requirements between ICE Clear and members’ APS banks. Settlement of cash and some physically settled contracts is also made across the APS. Early morning calls have to be met by 09:00 London Time and intraday calls within one hour. CDS coupon and credit event payments are made in CLS.

Energy contracts clear on an open offer basis, whereby contracts with the clearing house automatically form upon trade matching on the respective market (eg at ICE Futures Europe).

For CDS clearing, confirmed, eligible transactions that are submitted to the DTCC’s Markit/SERV Transaction Information Warehouse can be submitted for clearing to ICE Clear Europe. On clearing, the bilateral contract is replaced by two contracts with the clearing house.

4.2.2.5 Risk management

As detailed in its rulebook, ICE Clear Europe sets membership criteria for all clearing members, including additional requirements for CDS clearing members. This includes a minimum capital requirement of USD 10 million for energy clearing members and a capital requirement of USD 5 billion for CDS clearing members. In addition to the financial resource requirements for members, the membership rules cover operational capability, risk management experience and regulatory oversight.

The clearing house calculates margin using the SPAN4 algorithm for energy clearing. For CDS, the clearing house uses a proprietary risk assessment methodology which is shared with ICE Trust and developed by the group subsidiary, The Clearing Corporation (TCC).

Intraday margin calls can be made between 09:00 and 22:00 London Time and must be met within 60 minutes of notification by the clearing house. Margin calls are made in accordance with the intraday margin calling policy.

Clearing members must pay the end-of-day variation margin by 09:00 London Time on the following business day. Margin payments are met in accordance with the clearing house's list of permitted cover, which includes cash and acceptable non-cash collateral.

In addition, ICE Clear Europe may execute a special margin call in response to its risk monitoring of members. For example, a concentration risk margin multiplier is applied to large positions.

ICE Clear Europe invests cash margin in accordance with its investment policy.

Clearing members are obliged to make minimum contributions to the guarantee fund. ICE Clear Europe maintains a separate energy and CDS guarantee fund, which aims to mutualise losses under extreme market scenarios. In addition, the clearing house may call additional funds from non-defaulting members. ICE Clear Europe has contributed USD 100 million to its energy guarantee fund. Additionally, ICE has contributed USD 10 million to the CDS guarantee fund and has committed a further USD 40 million over a two-year period.

In the event of a member default, the clearing house will close out the defaulting member's positions in accordance with its rulebook. The order in which the clearing house utilises assets to meet the obligations and liabilities of the defaulter is also specified in the rulebook.

Risks in the embedded payment arrangements are managed by setting minimum criteria for APS banks and establishing payment deadlines.

4.2.2.6 Links to other systems

ICE Trust and TCC provide services to ICE Clear Europe under an outsourcing agreement. The services are provided through a common infrastructure, ICE Clear Europe does not have links to any other central counterparty.

ICE Clear Europe also has links with large-value payment systems to make cash payments (CHAPS, TARGET2, Fedwire and CHIPS). It uses the SWIFT network to communicate with its APS banks and accesses CLS via JP Morgan.

4.2.2.7 Pricing

ICE Clear Europe is a wholly owned subsidiary of ICE, a publicly listed company on the New York Stock Exchange. It charges members clearing fees on a per-lot basis.

4.2.2.8 Major ongoing and future projects

ICE Clear Europe has recently undertaken a post-trade and clearing systems migration programme, in which the clearing house has replaced the TRS/CPS platform with an in-house clearing system.

4.2.3 Central counterparty EuroCCP

4.2.3.1 Institutional framework

The London-based European Central Counterparty Ltd (EuroCCP) is a wholly owned subsidiary of the US-based Depository Trust and Clearing Corporation (DTCC). DTCC is

owned and governed by its users. EuroCCP has its own board and board committees, including audit and risk committees.

EuroCCP is regulated in the United Kingdom by the FSA as a recognised clearing house under FSMA 2000. In addition, EuroCCP is designated under the Settlement Finality Regulations.

4.2.3.2 Participation

Firms wishing to directly use the services of EuroCCP are required to become participants. There are two types of participant: general clearing participants (who can clear for themselves and non-clearing participants of the MTF platforms that EuroCCP clears for), and individual clearing participants (who can clear for themselves only). Firms that are not participants of EuroCCP can access the firm's services through the establishment of a clearing arrangement with a general clearing participant (for non-clearing participants of the MTF platforms and individual clients who are not participants of the MTF) or individual clearing participants (for individual clients who are not participants of the MTF only). As of February 2011, EuroCCP had 15 active general clearing participants and 12 individual clearing participants.

4.2.3.3 Types of transaction

EuroCCP clears cash equity products for a number of European multilateral trading facilities, most importantly for Turquoise. It clears for a total of 19 markets throughout Europe.

4.2.3.4 Operation of the system

EuroCCP uses Citibank as its concentration bank and participants pay margin and default fund contributions either directly into EuroCCP's account with Citibank or via a payment bank of their choice. EuroCCP calculates margin requirements overnight and calls outstanding margin from its participants every day early in the morning. To this end, EuroCCP has powers of attorney in place with the settlement banks its participants use. This allows it to send direct instructions to these banks on behalf of its participants.

EuroCCP uses SWIFT messages to communicate margin requirements to participants and with its settlement agent.

4.2.3.5 Risk management

EuroCCP requires margin payments to cover the default risk posed by its participants when it accepts trades into clearing. EuroCCP's margin fund is made up of a number of components, the most important of which are charges equivalent to the concepts of initial and variation margin. EuroCCP also reviews its risk exposure regularly throughout the day and has the ability to call intraday margin.

Margin may be provided in either cash or acceptable non-cash collateral. EuroCCP accepts a number of government bonds, cash and letters of credit as eligible collateral (subject to a minimum 40% cash requirement). EuroCCP also has minimum capital requirements for its participants and can add special charges to margin calls should it identify a concern with the creditworthiness of a participant.

If the default of a participant exhausts the margin funds provided by that participant, EuroCCP can access the collateral paid by the defaulting participant into the guarantee fund and, if necessary, the guarantee fund contributions of all its other participants. Should the guarantee fund also be exhausted, EuroCCP requires its participants to indemnify it against any excess loss. Participants can limit their liability for any excess loss in accordance with EuroCCP's rules. EuroCCP's rules also give it the discretion to use its capital to meet losses after a defaulting participant's funds have been exhausted, before invoking loss-sharing agreements with all its other participants.

4.2.3.6 *Links to other systems*

As at April 2011, EuroCCP has no links with other clearing houses. It uses Citibank as the settlement agent for the 19 European markets it serves. Where it is a direct member of the local CSD, its accounts are operated by Citibank. EuroCCP has connections to all platforms it clears for.

4.2.3.7 *Pricing*

EuroCCP is a wholly owned subsidiary of DTCC, which is a user-owned entity operating an at-cost model. In DTCC's model, excess profits are typically rebated back to its users.

4.2.3.8 *Major ongoing and future projects*

As of April 2011, EuroCCP's key future project is the launch of interoperability with other clearing houses for a number of trade platforms.

4.3 **Securities settlement system**

4.3.1 **CREST**

Inaugurated on 15 July 1996, the CREST system was originally owned and operated by a private sector company, CRESTCo Ltd, which itself was owned by a range of CREST users. In September 2002, CRESTCo merged with Euroclear. On 1 January 2005, a corporate restructuring of Euroclear created a new parent company called Euroclear SA/NV with CRESTCo, Euroclear France, Euroclear Nederland, Euroclear Belgium and Euroclear Bank as its subsidiaries. On 1 July 2007, CRESTCo Ltd changed its name to Euroclear UK & Ireland Ltd (EUI) and on 1 September 2010, EUI merged with EMX Company Limited (the operator of an electronic router for funds orders and settlement messages), which had been part of the Euroclear Group since 1 January 2007. Euroclear Plc, which owns Euroclear SA/NV is a UK-registered private company owned by around 200 user-shareholders, mainly major banks and brokers (see also the descriptive Red Book chapter on the euro area).

4.3.1.1 *Institutional framework*

The CREST system is operated by EUI. CREST supports securities settlement for UK and Irish equities as well as corporate bonds, government debt, money market instruments and exchange traded funds. EUI's International Service enables CREST members to hold and settle transactions in foreign securities through links with other CSDs.

EUI is authorised as an operator of a relevant system under the Uncertificated Securities Regulations 2001 (USRs). The USRs provide the legal basis for the dematerialisation of UK securities and the transfer of dematerialised securities in the CREST system by way of electronic transfer of title. EUI is regulated in the United Kingdom by the FSA as a recognised clearing house under FSMA 2000. EUI is also authorised as an operator of systems in Ireland, Jersey, and the Isle of Man. The CREST system is also a designated system in the United Kingdom and Ireland under the Settlement Finality Directive.

On 5 January 2010, HM Treasury recognised the embedded payment arrangements within the CREST system as an interbank payment system under Part 5 of the Banking Act 2009, giving the Bank of England statutory responsibility for overseeing it.

CREST's embedded payment arrangements are covered by a memorandum of understanding between the Bank and the FSA regarding the oversight of payment systems. The Bank, the FSA, and the Central Bank of Ireland have a memorandum of understanding for cooperation on the regulation of services provided by EUI relating to the settlement of Irish securities.

4.3.1.2 Participation

EUI offers membership for corporate entities and individuals regardless of domicile or location (except as mentioned below). CREST membership ranges from banks and broker-dealers to private clients. These are mainly firms that are active in the UK and Irish equity markets and the gilt market (or their custodians). The CREST Terms and Conditions and Rules set out the requirements for participating in the CREST system.

In CREST terminology, there is a distinction between “participants” and “users”. Participants are those who hold securities in the CREST system (“members”) or who provide payment services (“settlement banks”) or registration services (“registrars”). Users are those who communicate with the CREST system for themselves and/or behalf of participants. EUI requires users to locate their gateway computers (the secure equipment used for sending/receiving electronic messages to/from the CREST system) in the United Kingdom, Ireland, or another jurisdiction approved by EUI.

Most corporate members maintain and operate their own securities accounts in the CREST system (“direct members”). “Personal members” (mainly individuals) maintain accounts in their own name, but use the facilities of a user (a “sponsor”) to communicate with CREST. Sponsors are required to be authorised under FSMA. Non-members of CREST who are active participants in the equity or gilt markets typically hold their accounts with custodians or brokers who are direct members of the system, although individuals may choose to hold their securities outside the system altogether, in paper form.

Applicants must enter into a contractual agreement with EUI to participate in the CREST system. They also must enter into a contractual arrangement with an approved CREST settlement bank in order to receive credit in the CREST system to settle their transactions. EUI may require participants and users incorporated or resident outside the United Kingdom to provide a legal opinion confirming the participant’s or user’s ability to be bound by the terms of the agreement executed by EUI and the participant or user.

EUI serves over 35,000 members of which approximately 2,850 are corporate participants. There are 14 CREST settlement banks including the Bank of England. The access criteria for CREST settlement banks are set out in the CREST Rules.

4.3.1.3 Types of transaction

The CREST system settles the purchase, sale, loan and repo of UK and Irish equities and UK government and corporate debt. The UK regulations governing the CREST system (ie the USRs) permit only the admission of securities constituted under English, Scottish or Northern Irish laws. But under a multi-jurisdictional model, securities governed by Irish, Jersey, Guernsey and Isle of Man laws are admitted pursuant to the laws of those jurisdictions (see Section 4.4.1.6 below). Moreover, through the system’s links to other settlement systems in Europe and the United States, members are able to hold foreign securities. Some lines of foreign securities are held under depository arrangements established for settlement purposes by the registrar (an agent appointed by the issuer).

4.3.1.4 Operation of the system

In general, CREST executes only transfer instructions that it receives via an accredited communications network either from the member whose account is to be debited or credited, or its sponsor. The terms of the transfer must be confirmed by both the transferor and the transferee, who input independent instructions into CREST that are matched before proceeding to settlement. In relation to transactions on certain trading venues, EUI provides central sponsor services enabling members or their settlement agents to opt to allow settlement instructions to be created automatically on their behalf and to be input by another CREST user acting as a central sponsor.

The settlement process is continuous between 06:00 and 16:40, with settlement against payment ceasing at 16:10. The system remains open for input and matching of forward-dated transactions until 20:00.

CREST has two accredited network service providers for communications between the CREST system and users – SWIFT and BT Syntegra. Different arrangements apply to communications with participants that are CSDs, exchanges or CCPs.

The CREST system provides DVP1 settlement in central bank money with simultaneous and irrevocable transfer of cash and securities for all sterling and euro payments. The USRs establish that the CREST record is the register for dematerialised UK securities (the operator register) such that, at the point of settlement in the CREST system, the transferee/buyer receives immediate and irrevocable direct legal title to the dematerialised securities. Finality of stock and cash is therefore simultaneous. The USRs require the issuer's registrars to keep a duplicate record that must be reconciled with the operator register and is referred to for the purposes of general meetings and corporate actions. For Irish, Jersey, Guernsey and Isle of Man securities, the register of legal title is maintained by the issuer's registrar.

Also at the point of settlement, the CREST payment that discharges the buyer's obligation to the seller is accompanied by a irrevocable undertaking by the Bank of England (for sterling) and the Central Bank of Ireland (for euro) to debit the buyer's settlement bank and credit the seller's settlement bank accounts. The Bank applies such credit and debit postings across the settlement banks' RTGS CREST accounts at the end of each cycle. The Central Bank of Ireland applies such postings at the end of the day. As a result, the buyer is solely exposed to the risk on its chosen settlement bank, and intraday risks between the settlement banks are eliminated. Settlement banks maintain separate RTGS accounts at the Bank of England for CREST and for "clean" payments (ie those arising for activities other than securities settlement in the CREST system). Settlement banks balance (by means of liquidity transfers) their available funds between these RTGS accounts throughout the day according to the demands arising in CREST or from clean payments. At the start of each CREST settlement cycle, the liquidity balance on each settlement bank's RTGS CREST settlement account is irrevocably earmarked for CREST settlement.

Once the CREST system has identified a set of transactions for which sellers have stock, buyers have cash or credit, and buyers' settlement banks have sufficient earmarked RTGS liquidity, these transactions will be settled with finality. Only transactions where both stock and cash/credit are known to be available will be queued against the liquidity that the settlement banks have earmarked for CREST settlement. Where available liquidity is insufficient, uncovered transactions will be queued against liquidity provided by the settlement bank in the next CREST settlement cycle. Once stock has been transferred with legal title, and members' cash/credit positions are updated within the CREST system, the Bank of England and the Central Bank of Ireland are notified of settlement banks' usage of earmarked liquidity and the transfers between them, and they implement the relevant postings across settlement banks' accounts. Remaining earmarked liquidity is then released and any queued liquidity transfers effected. For CREST Sterling, the earmarking process can then begin again for the next settlement cycle.

The CREST system provides DVP2 settlement in commercial bank money for US dollar payments. CREST US dollar transactions are settled in the CREST system during the settlement day. However, CREST settlement banks discharge their net bilateral US dollar payment obligations at the end of the day outside the CREST system.

EUI provides support to several central clearing counterparties (CCPs) for the services they offer to various trading platforms. EUI offers two types of clearing-related service: the CREST Clearing Support Arrangement, which is more limited (includes the direct input service) and the CREST Central Counterparty Services (which include direct input, the netting service, and maintenance of databases containing various data such as open position data and margin data calculated by the CCPs). The direct input service enables the automated

creation of transactions on behalf of CREST members by a CREST central sponsor without the need for those participants to input or match such transactions themselves.

In July 2002, the CCP service for trades made through the London Stock Exchange's electronic orderbook was expanded to include the option of settlement netting. As a result of this enhancement, CREST users who opt for the service have only one settlement instruction to settle in each line of stock as a result of a day's trading. Netting only applies to sufficiently similar contracts; and the settlement (with LCH and SIX x-clear as CCPs) takes place on T+3, as for non-netted electronic orderbook trades. Other CCPs have joined the EUI system in 2010 under the CREST clearing support arrangements.

4.3.1.5 Risk management

CREST settlement banks are contractually bound to settle debts incurred in the CREST system by their customers. The settlement banks provide their customers with intraday credit in the CREST system, limiting their own exposure by setting up debit caps within the system; the CREST system itself provides no credit facilities. The debit cap represents the maximum debit position that a settlement bank is willing to assume for a given customer and is a combination of unsecured credit and secured credit advanced in return for a charge over securities held by their customer in the CREST system.

To increase the supply of intraday sterling liquidity available to the settlement banks, EUI and the Bank of England support a demand-driven auto-collateralisation repo arrangements whereby a purchasing CREST member may use eligible securities (mainly UK government securities) in the course of settlement to generate intraday sterling liquidity for its settlement bank.

The CREST system is supported by two data centres that are updated synchronously in real time.

4.3.1.6 Links to other systems

The CREST system has cross-border links with Euroclear Bank SA/NV, Euroclear Nederland, Depository Trust and Clearing Corporation (DTCC), and SIX SIS Ltd. A wholly owned subsidiary of EUI (CREST Depository Limited), through a nominee, holds the underlying international securities in an account with the relevant CSD (either directly or through a custodian).

A holder of a foreign security in the CREST system receives a CREST Depository Interest (CDI), an English law instrument representing the holder's proprietary interest in the underlying international security, which is held on his behalf in the foreign CSD by the CREST nominee. A deed poll executed by CREST Depository Limited (CDL) sets out the holder's right against CDL to the underlying security. The CDI holder has legal title to the CDI and beneficially owns the underlying foreign security.

4.3.1.7 Pricing

EUI regularly reviews its tariff arrangements in consultation with CREST participants and users to ensure that CREST services provide a consistent income stream for EUI, that different market sectors are not disadvantaged, and that economies of scale are returned to the market via tariff reductions or rebates.

4.3.1.8 Use of securities infrastructure by the central bank

The Bank of England uses CREST to receive collateral to support its monetary policy operations and to receive collateral to provide intraday liquidity to its RTGS CHAPS sterling settlement banks. The Bank also provides intraday liquidity to CREST sterling settlement banks in CREST through CREST self-collateralising repo transactions. The Bank also uses CREST to support its proprietary and customer custody business. This includes acting as the UK Debt Management Office's settlement agent for the issuance and management of UK gilts and Treasury bills in CREST. The Bank uses CREST for UK securities and uses other (I)CSDs and central banks for non-UK securities.

**Payment, clearing and
settlement systems in the
United States**

Contents

List of abbreviations	475
Introduction.....	477
1. Legal and regulatory aspects	477
1.1 The general legal framework	477
1.2 The role of the Federal Reserve	480
1.2.1 Supervision of payment, settlement and clearing activities and infrastructures.....	480
1.2.2 Provision of payment and settlement services	481
1.3 The role of other private and public sector bodies.....	482
1.3.1 Financial intermediaries.....	482
1.3.2 Other institutions that provide payment services.....	483
1.3.3 Consumer Financial Protection Bureau (CFPB).....	484
2. Payment media used by non-financial entities	484
2.1 Cash payments.....	484
2.2 Non-cash payments.....	484
2.2.1 Non-cash payment instruments	484
2.2.2 Interchange fee regulation	486
3. Payment systems (funds transfer systems).....	486
3.1 General overview.....	486
3.2 Large-value payment systems	487
3.2.1 Fedwire Funds Service	487
3.2.2 Clearing House Interbank Payments System (CHIPS).....	488
3.2.3 National Settlement Service (NSS)	490
3.3 Retail payment systems.....	492
3.3.1 Cheque clearing systems	492
3.3.2 Automated clearinghouse (ACH)	493
3.3.3 Payment card networks	493
4. Systems for post-trade processing, clearing and settlement	494
4.1 General overview.....	494
4.2 Trade repositories.....	494
4.2.1 DTCC Data Repository (US) LLC	494
4.3 Central counterparties (CCPs) and clearing systems.....	494
4.3.1 National Securities Clearing Corporation (NSCC).....	494
4.3.2 Fixed Income Clearing Corporation – Government Securities Division (FICC/GSD).....	496

4.3.3 Fixed Income Clearing Corporation – Mortgage-Backed Securities Division (FICC/MBSD)	499
4.3.4 The Options Clearing Corporation (OCC)	500
4.3.5 CME Clearing	502
4.3.6 ICE Clear Credit LLC	504
4.3.7 Other clearing systems	505
4.4 Securities settlement systems.....	506
4.4.1 Fedwire Securities Service	506
4.4.2 The Depository Trust Company (DTC).....	507

List of abbreviations

CFPB	Consumer Financial Protection Bureau
CFTC	US Commodity Futures Trading Commission
CHIPS	Clearing House Interbank Payments System
DCE	designated clearing entity
DCO	derivatives clearing organisation
DFA	Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010
DTC	The Depository Trust Company
DTCC	The Depository Trust and Clearing Corporation
EFAA	Expedited Funds Availability Act of 1987
EFTA	Electronic Fund Transfer Act of 1978
EPN	Electronic Payments Network
ET	eastern time
FCM	futures commission merchant
FICC	Fixed Income Clearing Corporation
FICC/GSD	Government Securities Division of Fixed Income Clearing Corporation
FICC/MBSD	Mortgage-Backed Securities Division of Fixed Income Clearing Corporation
FMU	financial market utility
FSOC	Financial Stability Oversight Council
GSE	government-sponsored enterprise
GTR	global trade repository
MCA	Monetary Control Act of 1980
NOW	negotiable order of withdrawal
NSSC	National Securities Clearing Corporation
NSS	National Settlement Service
NYPC	New York Portfolio Clearing
OC	Federal Reserve Operating Circular
OCC	The Options Clearing Corporation
PSR policy	Federal Reserve Policy on Payment System Risk
S&L	savings and loan association
SEC	US Securities and Exchange Commission
UCC	Uniform Commercial Code

Introduction

Payment systems, clearing houses, central securities depositories and securities settlement systems are key institutions in the US financial market infrastructure. Payment systems in the United States include mechanisms for processing both wholesale and retail funds transfers. At the wholesale level, two large-value electronic funds transfer systems settle the bulk of the dollar value of all payments in the United States. At the retail level, non-cash payments are processed over a number of systems, including cheque clearing systems, automated clearing house systems and credit and debit card networks. While a significant but unknown number of payments continue to be settled in cash, almost all non-cash payment instruments, including cheques, settle electronically. In addition, innovation and competition have facilitated the use of new instruments and payment channels that rely increasingly on electronic payment mechanisms.

Central securities depositories and securities settlement systems facilitate the safekeeping of securities and the guarantee and settlement of different types of securities transactions. Generally in the United States, a single system acts as both a central securities depository and a securities settlement system for a specific set of securities. Central counterparties (CCPs) facilitate the clearing and guarantee of various types of financial transactions, including securities and derivatives transactions, traded either on exchanges or over the counter (OTC). Generally, each CCP clears a specific set of contracts. In recent years, trade repositories have been developed to collect and maintain information on various financial transactions, in particular those involving OTC derivatives. Trade repositories have improved the overall transparency in the OTC derivatives markets.

As the central bank of the United States, the Federal Reserve provides certain payment and settlement services to depository institutions. Private sector operators of payment, clearing and settlement systems also provide such services to financial institutions. Several government agencies play active roles in the oversight and regulation of private sector payment, clearing and settlement systems, most notably the Federal Reserve, the Securities and Exchange Commission (SEC) and the Commodity Futures Trading Commission (CFTC). The Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 (DFA) provides additional authorities for these or other relevant regulatory agencies over payment, clearing and settlement systems designated by the new Financial Stability Oversight Council (FSOC) as systemically important.

1. Legal and regulatory aspects

1.1 The general legal framework

Payment, clearing and settlement systems in the United States are governed by statutes, regulations and case law at the state and federal levels. The legal principles relevant to a particular system generally depend on the method of payment, the type of transactions cleared and settled, and, in some cases, the status of parties to a payment. Within the relevant governing law, rules and membership agreements of private clearing and settlement arrangements provide a contractual framework for payments activity. For payment services operated by the Federal Reserve, Federal Reserve regulations and operating circulars specify the terms and conditions under which services are provided. In addition, the DFA, enacted on 21 July 2010, was one of the most significant pieces of legislation affecting the US financial regulatory framework in many years. Several parts of the DFA related to payment, clearing and settlement systems are discussed below.

At the state level, the Uniform Commercial Code (UCC) provides a set of model statutes governing certain commercial and financial activities, including some banking and securities

market transactions. The following articles of the UCC pertain to payment and settlement activities: Article 3 (negotiable instruments), Article 4 (bank deposits and collections), Article 4A (funds transfers), Article 8 (investment securities) and Article 9 (secured transactions). These articles, sometimes with local variations, have been incorporated into the laws of all the states.

The Federal Reserve's funds transfer system, the Fedwire Funds Service (Fedwire Funds), is governed by Federal Reserve Regulation J, which defines the rights and responsibilities of financial institutions that use Fedwire Funds as well as the rights and responsibilities of the Federal Reserve. Federal Reserve Operating Circular (OC) 6 covers items such as Fedwire Funds operating hours, security, authentication, fees and certain restrictions. OC 6 also requires each Fedwire Funds participant to enter into a security procedures agreement with its Federal Reserve Bank (Reserve Bank). In addition, OC 1 governs account relationships and OC 5 governs electronic access to Fedwire Funds. A depository institution sending payment orders to a Reserve Bank is also required to have sufficient funds, either in the form of account balances held at the Federal Reserve or daylight overdraft capacity. Funds transfers made through the Clearing House Interbank Payments System (CHIPS) are subject to CHIPS rules and procedures and the laws of the State of New York. Both Fedwire Funds and CHIPS operate under the requirements of UCC Article 4A.¹ Federal Reserve Regulation CC regulates the time in which a depository institution receiving a Fedwire Funds or CHIPS funds transfer on behalf of a customer must make those funds available to its customer.

The Federal Reserve operates its securities transfer system, the Fedwire Securities Service (Fedwire Securities), under OC 7, which covers issues for Fedwire Securities that are similar to those covered in OC 6 for Fedwire Funds. As with Fedwire Funds, OC 1 governs account relationships and OC 5 governs electronic access to Fedwire Securities. Transaction enforceability is governed by state securities and commercial codes, in particular UCC Articles 8 and 9.²

Articles 3 and 4 of the UCC form the legal basis for paper-based cheque transactions in the United States. In addition, the Expedited Funds Availability Act of 1987 (EFAA) and the Check Clearing for the 21st Century Act of 2003 (Check 21 Act) are important federal statutes governing cheque collection. The EFAA grants the Board of Governors of the Federal Reserve System (the Federal Reserve Board, or the Board) authority to improve and accelerate the collection and return of cheques among depository institutions. The Check 21 Act authorised a new negotiable instrument called a "substitute cheque". A substitute cheque is a paper reproduction of an original cheque that contains an image of the front and back of the original cheque. Under the Check 21 Act, a properly prepared substitute cheque is the legal equivalent of the original cheque for all purposes. By authorising banks to create substitute cheques, the Check 21 Act enables banks to truncate original paper cheques, process them electronically, and create substitute cheques for delivery to banks or customers that do not accept cheques electronically. The Federal Reserve implements the EFAA and the Check 21 Act through Regulation CC. In addition to Regulation CC, cheques collected through the Federal Reserve Banks are governed by subpart A of the Federal Reserve Regulation J and OC 3, which provide rules for collecting and returning items through the Federal Reserve.

¹ Article 4A does not address transactions that are governed by the Electronic Fund Transfer Act of 1978 (primarily consumer electronic funds transfers).

² UCC Article 8 sets out rules regarding the rights and obligations of entitlement holders, securities intermediaries, and other parties in both direct and indirect systems for holding securities. UCC Article 9 governs the rights and obligations of parties to a secured transaction.

The rights and liabilities of both consumers and financial institutions involved in consumer electronic payment transactions, including funds transfers through ACH, ATM or POS networks, are governed by the Electronic Fund Transfer Act of 1978 (EFTA) and Regulation E. Regulation E also sets standards for financial disclosure, debit and credit card issuance, access and error-resolution procedures applicable to all financial institutions. Other federal laws and policies affecting consumer use of electronic funds transfers include the Office of the Comptroller of the Currency's Consumer Protection Guidelines and the Truth-in-Lending Act (and Regulation Z issued thereunder), which provide for the disclosure of costs and terms of consumer credit. In addition, the Fair and Accurate Credit Transactions (FACT) Act of 2003 included protections for consumer financial information, such as requiring merchants to truncate the account number of credit and debit card receipts.

Section 1075 of the DFA, which added a new section to the EFTA, directed the Federal Reserve Board to issue rules relating to debit card interchange fees, including a fraud-prevention adjustment, network exclusivity arrangements and transactions routing. Federal Reserve Regulation II implements these rules (see Section 2.2.2).

The Federal Reserve, as supervisor and regulator of certain financial institutions, is the primary federal banking regulator for several payment, clearing and settlement systems.³ In addition, the Federal Reserve Board, by statute, supervises the Federal Reserve Banks and their provision of payment and settlement services such as Fedwire Funds. The Federal Reserve Policy on Payment System Risk (PSR policy) addresses the risks that payment and settlement activities present to the financial system and to the Reserve Banks. Through the PSR policy, the Federal Reserve Board establishes standards for financial system participants to reduce and control settlement and systemic risk arising in payment and settlement systems, consistent with the smooth operation of the financial system.⁴

The Commodity Futures Trading Commission is the primary regulator of derivatives clearing organisations (DCOs), which are clearing houses for futures contracts, options on futures contracts, and swaps. To be registered or maintain registration as a DCO, a clearing house must comply with the CFTC's Core Principles as established in the Commodity Exchange Act (CEA). Recently, the DFA amended the CEA to re-adopt and amend 14 existing core principles and add four new ones.

The Securities and Exchange Commission is the primary regulator of securities clearing agencies (eg central counterparties, securities settlement systems and central securities depositories). The SEC's Standards for the Registration of Clearing Agencies are a set of guidelines that the SEC applies in considering whether to grant or deny registration of a clearing agency. The Standards for the Registration of Clearing Agencies also serve as guidance to assist clearing agencies in assessing whether their organisations, capacities and rules comply with the clearing agency registration provisions of the Securities Exchange Act of 1934 (SEA).

³ See Section 1.2 for the structure of the Federal Reserve System. See Section 1.2.1 for the types of financial institutions for which the Federal Reserve is primary supervisor.

⁴ The PSR policy consists of two parts: Part I sets forth the Board's risk management expectations for payment and settlement systems subject to its authority, including systems operated by the Reserve Banks. The policy also establishes specific expectations for systemically important systems, including compliance with internationally accepted risk management standards for payment systems, securities settlement systems and central counterparties, as adopted in the policy. The Board has incorporated the international standards set out in the CPSS Core Principles for Systemically Important Payment Systems and the CPSS-IOSCO Recommendations for Securities Settlement Systems and Recommendations for Central Counterparties in its PSR policy. Part II of the PSR policy governs the provision of intraday credit (or daylight overdrafts) in accounts at the Reserve Banks and sets out the general methods used by the Reserve Banks to control their intraday credit exposures.

Title VII of the DFA extended the authority of the CFTC and SEC over swaps traded over the counter in a number of ways, including with respect to trading and clearing. Title VII includes a mandate for the central clearing of standardised swaps. Title I of the DFA established the Financial Stability Oversight Council, which is charged with monitoring and identifying emerging risks to financial stability across the entire financial system, identifying potential regulatory gaps and coordinating agencies' responses to potential systemic risks. The FSOC comprises 10 voting members: the Treasury Secretary (who serves as chairperson of the FSOC); the Chairman of the Federal Reserve Board; the heads of the Consumer Financial Protection Bureau (CFPB), Office of the Comptroller of the Currency, SEC, Federal Deposit Insurance Corporation (FDIC), CFTC, Federal Housing Finance Agency (FHFA) and National Credit Union Administration (NCUA); and an independent member with insurance expertise appointed by the President and confirmed by the US Senate. The FSOC also includes five non-voting members who serve in an advisory capacity: the directors of the Treasury Department's Office of Financial Research and the Federal Insurance Office, a state insurance commissioner, a state banking supervisor and a state securities commissioner.

Title VIII of the DFA gives the FSOC the authority to identify and designate a financial market utility (FMU) as systemically important if the FSOC determines that failure of or a disruption to the FMU could create or increase the risk of significant liquidity or credit problems spreading among financial institutions or markets thereby threatening the stability of the US financial system.⁵ In addition, the FSOC may designate certain payment, clearing or settlement activities as systemically important. Designation, among other things, allows the appropriate supervisory agency to impose enhanced risk management standards and supervision on the designated FMU or payment, clearing or settlement activity.

1.2 The role of the Federal Reserve

The Federal Reserve Act of 1913 established the Federal Reserve as the central bank of the United States and prescribed the general banking powers of the Federal Reserve. The Federal Reserve has responsibilities that encompass issuing banknotes, providing payment services, acting as the fiscal agent and depository of the United States government, supervising and regulating certain banking and financial institutions and conducting monetary policy. The Federal Reserve System includes 12 regional Federal Reserve Banks located throughout the United States and the Board of Governors in Washington, DC. The Board of Governors is responsible for the general supervision and oversight of the Reserve Banks, which are separately incorporated entities.

1.2.1 Supervision of payment, settlement and clearing activities and infrastructures

The Federal Reserve supervises and regulates US bank holding companies, financial holding companies and state-chartered commercial banks that are members of the Federal Reserve System.⁶ The Federal Reserve is also responsible for the supervision of Edge Act and agreement corporations as well as the operations of foreign banking organisations in the

⁵ For the purposes of the DFA, FMUs include payment, clearing and settlement systems but do not include trade repositories. On 18 July 2012, the FSOC designated eight FMUs as systemically important under Title VIII of the DFA. These designated FMUs are: (i) The Clearing House Payments Company LLC (PaymentsCo) on the basis of its role as operator of the Clearing House Interbank Payments System (CHIPS); (ii) CLS Bank International (CLS Bank); (iii) Chicago Mercantile Exchange, Inc (CME); (iv) The Depository Trust Company (DTC); (v) Fixed Income Clearing Corporation (FICC); (vi) ICE Clear Credit LLC; (vii) National Securities Clearing Corporation (NSCC); and (8) The Options Clearing Corporation (OCC).

⁶ All federally chartered banks are members of the Federal Reserve System. A state-chartered bank may become a member of the Federal Reserve System by applying to the Federal Reserve. Each member bank is required to subscribe to the capital stock of the Reserve Bank of its District.

United States.⁷ As noted in Sections 3 and 4 of this chapter, several financial market infrastructures are state-chartered banks or Edge Act corporations and are, therefore, supervised by the Federal Reserve.

Title VIII of the DFA strengthens the supervisory and regulatory framework related to payment, clearing and settlement systems in the United States and gives the Federal Reserve Board additional authority to assess systemic risks arising from these systems. Section 805(a) of the DFA authorises the Board to prescribe risk management standards governing the operations of FMUs that have been designated as systemically important by the FSOC, except for designated FMUs that are registered with the CFTC as derivatives clearing organisations or registered with the SEC as clearing agencies. These latter FMUs, known as designated clearing entities (DCEs), are subject to the applicable risk management standards contained in regulations prescribed by the CFTC or SEC, respectively. Section 806(e) of the DFA requires a designated FMU to provide advance notice to its supervisory agency of any proposed change to its rules, procedures or operations that could materially affect the nature or level of risks presented by the designated FMU. The CFTC and the SEC are required to consult with the Board on such notices provided by the DCEs. Under Section 807, the Board, CFTC and SEC must examine and may take enforcement action against designated FMUs for which they are the relevant supervisory agency. In addition, the CFTC and SEC are required to consult annually with the Board regarding the scope and methodology of their examinations of DCEs, and the Board may participate in any examination of a DCE. The Board may also recommend that the CFTC or SEC, as applicable, take enforcement action against the DCE.

Section 809 of the DFA authorises the Board to require a designated FMU to submit reports and data in order to assess the safety and soundness of the utility and the systemic risk that the FMU's operations pose to the financial system.

1.2.2 Provision of payment and settlement services

1.2.2.1 Note issuance

Virtually all US dollar paper currency in circulation is in the form of Federal Reserve notes (FR notes).⁸ Federal Reserve notes are ordered and issued by the Federal Reserve Board and produced by the Department of the Treasury's (US Treasury) Bureau of Engraving and Printing. The Federal Reserve Board compensates the US Treasury for the cost of printing FR notes.

The Board issues FR notes to the 12 Reserve Banks, which distribute FR notes to the public through depository institutions. FR notes are secured by legally authorised collateral, principally US government securities held by the Federal Reserve Banks. The Reserve Banks provide cash services to more than 9,000 of over 15,000 banks, savings and loan associations and credit unions in the United States. The remaining depository institutions obtain FR notes and coins from correspondent banks rather than directly from a Reserve Bank. The Federal Reserve Banks also distribute FR notes and coins internationally, primarily through the Federal Reserve Bank of New York, the Miami Branch of the Federal Reserve Bank of Atlanta and the Los Angeles Branch of the Federal Reserve Bank of San Francisco.

⁷ Edge Act and agreement corporations engage in international banking and investment activities. Edge Act and agreement corporations are chartered by the Federal Reserve Board under Section 25 of the Federal Reserve Act.

⁸ A small number of US notes remain in circulation. US notes were issued from 1862 to 1971 and remain legal tender. Federal Reserve notes were first issued in 1913 and are currently the only form of paper currency printed and issued.

1.2.2.2 Payment services to depository institutions

The Federal Reserve Banks provide a variety of payment and other services to depository institutions. Federal Reserve payment services include the distribution of FR notes and coins; the collection and return of cheques; the electronic transfer of funds via the Fedwire Funds Service, FedACH and the National Settlement Service (NSS); and the electronic transfer of federal government securities via the Fedwire Securities Service.

Individuals and institutions that do not take deposits are generally not permitted direct access to Federal Reserve payment services, though these entities may use these services indirectly as customers of depository institutions. Section 806(a) of the DFA, however, makes designated FMUs eligible for Federal Reserve services. Specifically, the Board may authorise a Reserve Bank to establish and maintain an account and provide deposit and payment services to the designated FMU under terms and conditions that the Board deems appropriate.

The Monetary Control Act of 1980 (MCA) requires the Federal Reserve to charge fees for certain payment services provided to depository institutions, including, for example, cheque collection, FedACH, Fedwire Funds and the NSS. The MCA also specifies that the Federal Reserve is to set fees in such a way that revenues recover the costs of providing payment services over the long term. The Federal Reserve is also required to include in its cost calculations not only its actual operating expenses but also imputed costs, including financing costs and taxes as well as the profit that would have been earned if a private firm provided the services.

1.2.2.3 Fiscal agency and depository services

The Federal Reserve Act provides that the Federal Reserve Banks will act as fiscal agents and depositories of the US government when required to do so by the Treasury Secretary. As fiscal agents and depositories for the federal government, the Reserve Banks auction Treasury securities, process electronic and cheque payments for the Treasury, collect certain funds owed to the federal government, maintain the Treasury's bank account and invest excess Treasury balances. The Reserve Banks also provide certain fiscal agency and depository services to other government agencies, government-sponsored enterprises (GSEs) and certain international organisations.

1.3 The role of other private and public sector bodies

1.3.1 Financial intermediaries

Financial intermediaries that provide payment services in the United States include more than 15,000 depository institutions.⁹ These institutions can be classified as commercial banks or as thrift institutions, such as credit unions and savings and loan associations (S&Ls). These classifications determine what services financial institutions may provide to the public and the regulatory structure to which the institutions are subject.

Commercial banks accept demand and time deposits, make commercial loans and provide the public with other banking services, including payment services. At year-end 2010, there were around 6,500 commercial banks in the United States.

⁹ The term "depository institution", which is defined in Section 19(b)(1)(A) of the Federal Reserve Act, is commonly used in the United States to refer to a deposit-taking financial institution, or one that accepts deposits.

Credit unions (state and federal) are cooperative organisations of individuals sharing a common affiliation, usually through employment with a particular company or organisation or membership in a labour union or church. Credit unions accept deposits of members' savings in the form of share purchases and pay interest, in the form of dividends on the shares, out of earnings. Credit unions also provide loans to members and provide transaction accounts upon which share drafts can be drawn. Federally chartered credit unions may provide and hold residential mortgages and issue credit and debit cards. At year-end 2010, there were nearly 7,500 credit unions in the United States.

S&Ls are federally or state-chartered and are required by law to make a certain percentage of their loans as home mortgages. They may be organised and owned by depositors, in which case they are called mutual associations, or they may be organised as stock-issuing corporations owned by shareholders. S&Ls can make consumer loans, offer negotiable order of withdrawal (NOW) accounts, issue credit and debit cards and offer certain types of commercial loans. Other savings institutions, such as federal savings banks, mutual savings banks and mutual stock banks, accept consumer deposits and invest primarily in residential mortgages and high-grade investment securities. Like S&Ls, these organisations may be owned by their depositors, in which case they are known as mutual savings banks, or they may be stock-issuing corporations owned by shareholders. At year-end 2010, there were almost 1,200 savings institutions (including S&Ls) in the United States.

1.3.2 Other institutions that provide payment services

Other organisations involved in providing payment services include so-called “nonbank banks”, payment card companies and the United States Postal Service. Nonbank banks (or limited-service banks) can make loans or accept deposits but cannot do both. Because of this distinction, a nonbank bank avoids meeting the legal definition of bank under the Bank Holding Company Act of 1956. The Competitive Equality Banking Act of 1987 closed this loophole, but nonbank banks in existence before 1987 were permitted to continue to operate under certain restrictions.

Payment card companies license credit and debit card trademarks to financial institutions, authorise transactions and provide certain clearing and settlement services for transactions between banks. Visa and MasterCard are the two largest payment card networks operating in the United States, but several smaller payment card networks are common throughout the United States. Other card-issuing companies include national “travel and entertainment” card issuers and a number of major retailers that issue cards to their customers.

The United States Postal Service sells postal money orders, which can be used to make payments. The United States Postal Service issued 121 million postal money orders during 2010.

Other entities that play a role in the United States payment system include those that provide specialised payment and settlement services and those that perform standard-setting or rule-writing functions. In 2010, private organisations providing payment and settlement services in the United States included the following: The Clearing House, several cheque clearing houses and specialised financial intermediaries, such as securities clearing corporations and central securities depositories.¹⁰

NACHA, a non-profit association of financial institutions and regional payments associations, formulates and promulgates rules and standards for processing ACH transactions throughout

¹⁰ The Clearing House provides a range of large- and small-value electronic payment services, including the Clearing House Inter-Bank Payments System (CHIPS), a wire-transfer system, the Electronic Payments Network (EPN), an ACH network, and SVPCO, a cheque clearing service.

the United States. In addition, regional ACH associations provide educational and promotional services to ACH participants.

1.3.3 Consumer Financial Protection Bureau (CFPB)

Title X of the DFA created an independent Consumer Financial Protection Bureau within the Federal Reserve to ensure that consumers have access to financial markets and that such markets are fair, transparent and competitive. The CFPB assumed rule-making authority for most federal consumer financial protection statutes, including almost all of the EFTA, in July 2011.¹¹

2. Payment media used by non-financial entities

2.1 Cash payments

Cash (FR notes and coins) is widely used as both a means of payment for many types of transactions and as a store of value in the United States and internationally. FR notes are issued by the Board and are printed in denominations of USD 1, 2, 5, 10, 20, 50 and 100. Coins are issued by the US Treasury's Mint in denominations of 1, 5, 10, 25, 50 cents and USD 1.

At year-end 2010, the value of notes and coins in circulation was USD 983 billion, of which USD 942 billion were notes. The amount of notes in circulation depends on the public's demand for them. Domestic demand largely results from the use of cash in transactions and is influenced primarily by prices for goods and services, income levels and population. US currency is also widely used outside the United States both for transactions and as a store of value. As much as two thirds of the value of US currency in circulation is estimated to be held abroad, primarily in USD 100 notes.

2.2 Non-cash payments

2.2.1 Non-cash payment instruments

In the United States, the money balances used by consumers and non-financial businesses to effect transactions are generally held as transaction deposits at depository institutions. These typically take the form of demand deposits, such as chequing accounts, NOW accounts and credit union share-draft accounts. At year-end 2010, the value of transaction accounts held at depository institutions was USD 1.1 trillion.

Savings accounts, money market deposit accounts, certain small and large time deposits, money market mutual funds and liquid investment assets, such as repurchase agreements and Eurodollar deposits, are less liquid but may nonetheless be used to fund payment activity. Some of these accounts, such as money market deposit accounts and mutual funds, may permit withdrawals of funds by cheque, often in minimum dollar amounts or in limited numbers. Savings deposits (including money market deposit accounts), retail money market mutual funds (general purpose only) and small time deposits totalled approximately USD 7.0 trillion at year-end 2010.¹²

¹¹ The EFTA is explained in Section 1.1.2.

¹² Small time deposits are issued in amounts under USD 100,000. Large time deposits, which do not include Eurodollar deposits, are issued in amounts of USD 100,000 or more.

2.2.1.1 Paper cheques

An estimated 22.8 billion cheques were paid in the United States in 2010, with a value of USD 29.0 trillion.¹³ In 2009, cheques accounted for about 22% of US non-cash payments, compared to 32% of non-cash payments in 2006. From 2006 to 2009, the number of cheques paid declined about 7.1% per year whereas the overall number of non-cash retail payments rose 4.6% per year. Of the approximately 16.2 billion interbank paid cheques in 2010, about 8.0 billion, or 49%, cleared through the Federal Reserve Banks.

In addition, as facilitated by the Check 21 Act, almost all interbank cheques in the United States are now truncated and processed in electronic form. By 2009, an estimated 97% of all interbank cheques in the United States involved the replacement of the original paper cheque with electronic payment information at some point in the collection process. In December 2010, about 99.7% of interbank cheques received by the Federal Reserve Banks were deposited in electronic form and about 98.4% of the interbank cheques delivered by the Reserve Banks were presented electronically to the banks on which they were drawn.

2.2.1.2 ACH credits and debits

ACH transactions are a common form of electronic funds transfer used to make recurring and non-recurring payments. There were about 19.1 billion ACH transactions during 2010, representing USD 38.4 trillion, more than twice as many transactions as there were in 2000 and 30% more than there were in 2006.¹⁴ ACH payments may be either credit or debit transactions. In an ACH credit transaction, funds flow from the originator to receiver and in a debit transaction, as with a cheque, funds flow from the receiver to the originator. ACH credit payments include direct deposit of payrolls, government benefit payments and corporate payments to contractors and vendors. Debit payments include cheques converted to ACH debits, one-time payments authorised via the internet or telephone, recurring mortgage and loan payments, insurance premiums, consumer bill payments and corporate cash concentration transactions.¹⁵ In addition, businesses and individuals may use the ACH to make payments to or receive reimbursement from the federal government related to federal tax obligations. Much of the growth in ACH payments over the last decade has been for non-recurring transactions such as consumer cheques that are converted into ACH payments by merchants and billers and for transactions initiated via the internet or telephone.

2.2.1.3 Credit cards

Credit cards combine a payment instrument with a credit arrangement. Some 21.4 billion credit card transactions were processed during 2010, valued at USD 2.0 trillion. General purpose credit cards are generally issued by a bank under a license from a payment card network, such as Visa or MasterCard, and typically involve a revolving credit agreement. There were 18.9 billion general purpose credit card transactions during 2010 valued at USD 1.7 trillion, along with 2.6 billion private label transactions valued at USD 175 billion.

2.2.1.4 Debit cards

Among non-cash payment types, debit cards grew the most over the past decade and have replaced cheques as the most frequently used non-cash payment instrument in the United States. These cards draw funds from a cardholder's transaction account (for instance, a

¹³ Inferred from the 2010 Federal Reserve Payments Study, www.frb services.org/files/communications/pdf/press/2010_payments_study.pdf.

¹⁴ See the 2010 Federal Reserve Payments Study.

¹⁵ Corporate cash concentration transactions are generally those initiated by an organisation to fund, or to consolidate funds, from its branches, franchises or agents.

transaction account) at an issuing bank. Some 43.8 billion debit card transactions were processed during 2010, valued at USD 1.6 trillion, compared with 26.0 billion processed during 2006, valued at USD 1.0 trillion. Debit cards are processed using either single-message systems or two-message systems. A single-message system is based on ATM/POS network technology that combines authorisation and clearing into one step in which transactions are usually authorised by entering a personal identification number (PIN) into a merchant's online terminal. A two-message system is based on credit card processing systems, in which the authorisation is completed in the first step and clearing is completed in a separate second step. Over 60% of debit card transactions were authorised using a two-message system, virtually all of which were processed over the Visa and MasterCard networks. In 2010, there were 14 single-message networks. The majority of single-message payments were processed over the Visa and MasterCard single-message networks.

Prepaid cards have also grown substantially over the past decade. Prepaid cards facilitate access to non-traditional financial accounts. These cards include general purpose reloadable cards, sometimes used as a substitute for a traditional bank chequing account, and payroll and government benefit transfer (EBT) cards issued to take the place of paycheques and government benefit cheques. Prepaid cards include specific-purpose restricted-use EBT cards provided by governments, private label and general purpose gift cards issued by retail merchants and card networks and rebate cards. In 2009, prepaid cards were used for 6.0 billion transactions valued at USD 142 billion. Of these, there were 2.7 billion private label prepaid card payments, 1.3 billion general purpose card payments and 2.0 billion EBT card payments valued at USD 44.7 billion, USD 42.8 billion and USD 54.5 billion, respectively.

2.2.2 Interchange fee regulation

Section 1075 of the DFA directs the Federal Reserve Board to issue rules relating to debit card interchange fees, network exclusivity arrangements and transactions routing. The Federal Reserve Board's Regulation II, Debit Card Interchange Fees and Routing, implements these provisions.

Interchange fee limitations do not apply to credit cards, issuers that (together with affiliates) have less than USD 10 billion in assets, debit cards issued pursuant to government-administered payment programmes or certain general-use prepaid cards. Covered issuers are permitted to receive an interchange fee up to a cap comprised of 21 cents per transaction plus 5 basis points of the value of the transaction. These issuers may also receive a small upward adjustment to the cap to account for fraud prevention costs.

In addition, the Board has prescribed rules prohibiting network exclusivity arrangements and routing restrictions in connection with electronic debit card transactions. In particular, all debit cards, regardless of the size of the issuer, must have at least two unaffiliated networks associated with them.

3. Payment systems (funds transfer systems)

3.1 General overview

In the United States, funds transfers occur primarily through the Fedwire Funds Service, CHIPS, the National Settlement Service (NSS), cheque clearing, ACH and payment card networks.

3.2 Large-value payment systems

There are two major large-value funds transfer systems in the United States: (i) the Fedwire Funds Service, operated by the Federal Reserve, and (ii) CHIPS, operated by The Clearing House Payments Company LLC. These payment systems are used by depository institutions and their customers to make large-value, time-critical US dollar transfers. In addition to the Fedwire Funds Service, the Federal Reserve also operates the National Settlement Service, which allows for multilateral settlement by clearing houses, financial exchanges and other clearing and settlement groups.

3.2.1 Fedwire Funds Service

3.2.1.1 Institutional framework

The Fedwire Funds Service (Fedwire Funds), owned and operated by the Federal Reserve Banks, is a real-time gross settlement system that enables participants to send and receive final payments in central bank money for their own accounts and on behalf of customers. Under the Federal Reserve Act, the Federal Reserve Board is responsible for general supervision and oversight of the Reserve Banks' provision of Fedwire Funds.

3.2.1.2 Participation

An institution that maintains an account at a Federal Reserve Bank is allowed to be a Fedwire Funds participant. Institutions with accounts at a Reserve Bank may access the Fedwire Funds Service subject to the conditions detailed in Operating Circular 6 and the PSR policy. These institutions include Federal Reserve member banks, non-member depository institutions and certain other institutions, such as US branches and agencies of foreign banks. The US Treasury and other federal agencies also participate in the Fedwire Funds Service as fiscal principals. Some 8,300 participants are able to initiate or receive funds transfers over Fedwire Funds.

3.2.1.3 Types of transactions

Participants use the Fedwire Funds Service to send or receive time-critical payments for their own accounts or on behalf of corporate or individual clients, to settle positions with other financial institutions or clearing arrangements and to submit federal tax payments. The Fedwire Funds Service processed an average of approximately 497,000 payments per day in 2010. The total value of funds transfers originated during 2010 was approximately USD 608 trillion.

3.2.1.4 Operation of the system and settlement procedures

The Fedwire Funds Service is a real-time credit transfer service. Participants originate funds transfers by instructing a Federal Reserve Bank to debit funds from the originator's account at the Reserve Bank and credit funds to the account of another participant. Fedwire Funds processes and settles payment orders individually throughout the operating day. Payment to the receiving participant over Fedwire Funds is final and irrevocable when the amount of the payment order is credited to the receiving participant's account or when notice is sent to the receiving participant, whichever is earlier.

Participants can access Fedwire Funds through computer-to-computer and browser-based electronic access services. Participants conducting large volumes of funds transfers typically use the computer-to-computer service, FedLine Direct. Participants conducting small to moderate volumes of funds transfers typically use the browser-based service, FedLine Advantage. In addition, participants can access the Federal Funds Service by telephone using the Federal Reserve Banks' offline access channel.

The Fedwire Funds operating hours for each business day begin at 21:00 eastern time (ET) on the preceding calendar day and end at 18:30 ET, Monday through Friday, excluding designated holidays. For example, processing on a non-holiday Monday begins at 21:00 ET on Sunday night and ends at 18:30 ET Monday night. The deadline for third-party transfers, those initiated or received by a participant on behalf of a customer, is 18:00 ET. Offline transfers generally cannot be initiated before 09:00 or after 18:00 ET (17:30 for third-party transfers). Under certain circumstances, online and offline operating hours may be extended.¹⁶

3.2.1.5 Risk management

Intraday central bank credit in the form of daylight account overdrafts may be available to holders of accounts at the Federal Reserve Banks, including participants in Fedwire Funds, subject to the terms and conditions set forth in the Federal Reserve Board's PSR policy. Fedwire Funds participants may use daylight overdrafts to facilitate payments throughout the operating day. In 2010, aggregate average daylight overdrafts for funds transfers averaged USD 2.4 billion per day and aggregate peak daylight overdrafts for funds transfers averaged USD 13.2 billion per day, which was about 0.6% of the average gross value of transfers settled each day.

Because funds transfers over Fedwire Funds settle in central bank money with immediate finality, credit risk to the receiving institutions is eliminated. To the extent that the Federal Reserve Banks provide daylight credit to a Fedwire Funds participant, they expose themselves to direct credit risk from participants. The PSR policy sets forth controls and other terms and conditions to mitigate this credit risk while providing sufficient liquidity to account holders for making payments. The PSR policy provides for risk assessments, net debit caps and daylight overdraft fees to control and limit exposures of Federal Reserve Banks to their depository institutions while also incentivising collateralisation to limit credit risk.

To manage operational risk, the Federal Reserve Banks have a number of procedures in place that ensure the resilience of the Fedwire Funds Service, including out-of-region backup facilities for Fedwire Funds applications and all integral support and related functions. The Reserve Banks routinely test the Fedwire Funds business continuity procedures across a variety of contingency situations, including unavailability of facilities, hardware, network or staff, to ensure timely resumption of Fedwire Funds operations in the event of a local, regional or widespread disruption. The Fedwire Funds applications and associated recovery procedures are regularly enhanced and tested to address various emerging risk scenarios.

3.2.2 Clearing House Interbank Payments System (CHIPS)

3.2.2.1 Institutional framework

CHIPS is a real-time computerised system for transmitting and settling US dollar payments among its participating banks. CHIPS is operated by The Clearing House Payment Company LLC (PaymentsCo), which is an affiliate of The Clearing House Association LLC (The Clearing House). CHIPS is subject to supervision and examination by the Federal Reserve and other federal bank supervisory agencies, under the auspices of the Federal Financial Institutions Examination Council. Also, PaymentsCo, on the basis of its role as the operator of CHIPS, has been designated as systemically important by the FSOC, and under Title VIII of the DFA the Federal Reserve is its supervisory agency.

¹⁶ A complete time schedule and list of holidays is available in Appendix B of OC 6. Additionally, guidelines pertaining to the extension of Fedwire hours are available in OC 6.

3.2.2.2 Participation

Participation in CHIPS is available to depository institutions resident in the US that meet the requirements detailed in the CHIPS rules.¹⁷ CHIPS participants must reside in the United States and be subject to supervision by US state or federal banking supervisors. A non-participant wishing to send payments over CHIPS must employ a CHIPS participant to act as its correspondent or agent. There are approximately 50 participants in CHIPS.

3.2.2.3 Types of transactions

Participants use CHIPS to settle a variety of large-value international and domestic payments, including those associated with the adjustment of correspondent balances, commercial transactions, bank loans and securities transactions. CHIPS processed an average of approximately 361,000 payments per day during 2010. The total value of transfers originated during 2010 was approximately USD 365 trillion.

3.2.2.4 Operation of the system and settlement procedures

CHIPS is a real-time final settlement system that continuously matches, nets and settles payment messages. Payment messages are sent to CHIPS through a multiprotocol label switching network or, as a backup, an integrated-services digital network. On a daily basis, the system provides real-time finality for all payment orders released from the CHIPS queue. To achieve real-time finality, payment orders are settled on the books of CHIPS against positive positions, simultaneously offset by incoming payment orders or both.

To facilitate settlement, the CHIPS prefunded balance account (CHIPS account) was established at the Federal Reserve Bank of New York. Under the real-time finality arrangement, each CHIPS participant has a pre-established opening position requirement, which, once funded via a Fedwire Funds transfer to the CHIPS account, is used to settle payment orders throughout the day.¹⁸ A participant cannot send or receive CHIPS payment orders until it transfers its opening position requirement to the CHIPS account. Opening position requirements can be transferred into the CHIPS account any time after the opening of CHIPS and Fedwire Funds at 21:00 ET. All participants must transfer their requirement no later than 09:00 ET. After a participant has paid its opening position requirement, it is permitted to transfer additional funds (known as supplemental funds) to the CHIPS account throughout the day to facilitate the settlement of priority and non-priority payments.¹⁹

During the operating day, participants submit payment orders to a centralised queue maintained by CHIPS. An optimisation algorithm searches the centralised queue for payment orders to settle, subject to restrictions contained in the CHIPS rules. When an opportunity for settlement involving one, two or more payment order(s) is found, the optimisation algorithm releases the relevant payment orders from the central queue and simultaneously marks the CHIPS records to reflect the associated debits and credits to the relevant participants' positions. Submitting participants may remove payment orders from the queue at any time prior to the daily cut-off time for the system (17:00 ET). Debits and credits are only reflected in CHIPS's records and are not recorded on the books of the Federal Reserve Bank of New York. Under New York law and CHIPS rules, payment orders are finally settled at the time of release from the central CHIPS queue.

¹⁷ CHIPS Rules are posted on the CHIPS website at <http://chips.org>.

¹⁸ PaymentsCo establishes the amount of a participant's opening position requirement using a formula that is based on the latest transaction history of each participant.

¹⁹ Priority payments are sent to a receiving participant without regard to certain maximum position limits.

At 17:00 ET, CHIPS attempts to match, net and release as many of the remaining payment orders as possible, although no participant is allowed to incur a negative position. As soon as this process is complete, any unreleased payment orders remaining in the queue are tallied on a multilateral net basis. The resulting net position for each participant is provisionally combined with that participant's current position (which is always zero or positive) to calculate the participant's final net position, and if that position is negative, it is the participant's closing position requirement.

Each participant with a closing position requirement must transfer its requirement to the CHIPS account via Fedwire Funds in order to release its remaining payment orders. These funds, once paid via a Fedwire Funds transfer, are credited to participants' balances in CHIPS. Once all of the Fedwire Funds transfers have been received, CHIPS can release and settle all remaining payment orders in the CHIPS queue. Although each participant with a closing position requirement is expected to send a Fedwire Funds payment order in the amount of that requirement to the CHIPS account, it is possible that a bank may not do so. In that case, unreleased payment orders remaining in the queue are tallied again on a multilateral basis, adjusted by the addition of amounts from the other participants that have paid their closing position requirements. This procedure allows CHIPS to release as many payment orders as possible. Payment orders still remaining in the queue will expire.²⁰ After completion of this process, CHIPS transfers to those participants who have any balances remaining the full amount of those positions, reducing the amount of funds in the CHIPS account at the Federal Reserve to zero by the end of the day.

3.2.2.5 Risk management

CHIPS requires participants to deposit a predetermined amount each day prior to the start of business. During the operating day, CHIPS does not release any payment message from the queue, and therefore does not settle any payment message, unless it can be debited against the participant's current position and no participant's current position is permitted to fall below zero. CHIPS also caps the maximum positive position that any participant can accumulate; this mitigates against the risk of too much liquidity pooling among a few participants, thus affecting the efficiency of the overall settlement process. All payment messages are final upon release to the receiving participant.

Each CHIPS participant is required to have access to sources of credit and liquidity sufficient to pay promptly each day its opening position requirement and its closing position requirement. Participants must be regulated by a US state or a federal bank regulatory authority to ensure that participants are examined on a regular basis and are operating in a sound manner. Each participant is also subject to a credit evaluation by PaymentsCo. CHIPS participants are required to file copies of their annual financial statements and are subject to a periodic review by the PaymentsCo board.

3.2.3 National Settlement Service (NSS)

3.2.3.1 Institutional framework

The National Settlement Service, owned and operated by the Federal Reserve Banks, is a multilateral settlement service used to settle for clearing houses, financial exchanges and other clearing and settlement arrangements. Under the Federal Reserve Act, the Federal Reserve Board is responsible for general supervision and oversight of the Reserve Banks' provision of NSS.

²⁰ Expiration of a payment order is treated as if the payment order was cancelled by the sending participant.

3.2.3.2 *Participation*

An NSS arrangement consists of a designated settlement agent and a group of depository institutions with accounts at a Reserve Bank that settles for the participants in the clearing arrangement. Each arrangement designates a settlement agent to submit settlement files to a Reserve Bank on behalf of the settlers. Settlement agents are not required to be depository institutions or to have accounts at the Federal Reserve. Their responsibilities include determination of settlement amounts by settler and electronic submission of NSS settlement files to the Federal Reserve Banks. At year-end 2010, 1,097 active settlers were part of 19 NSS arrangements established by financial market infrastructures, cheque clearing associations and ACH networks.

3.2.3.3 *Types of transactions*

NSS files multilaterally settle payments among a group of settlers in the private sector cheque clearing houses, the private sector ACH network and the securities settlement systems or other clearing houses that use NSS. In 2010, NSS processed approximately 7,000 settlement files and around 520,000 settlement entries. The total value of settlements during 2010 was approximately USD 14.5 trillion.

3.2.3.4 *Operation of the system and settlement procedures*

NSS provides an automated electronic mechanism for submitting multilateral settlement files to the Federal Reserve Banks. A settlement file contains a listing of the participants, the settlers (either the participant itself or the participant's correspondent) and the dollar amount of the debit or credit to be posted to the settler's account. For each file to be valid, debits must equal credits. If various validity checks are satisfied, the Federal Reserve accepts the file for processing and sends an acknowledgement to the agent. Settlement is final at the point when the settlement file is processed. OC 12 governs settlement over NSS. Each debit on the NSS settlement file is checked against the account balance and intraday credit available to the settlers in their Reserve Bank accounts to determine if it can be posted. In some instances, debits may be rejected if a settler does not have a sufficient balance, or sufficient intraday credit, to cover the debit. When all debit entries on the settlement file have been posted, NSS posts the corresponding credit balances. All postings are final and irrevocable when processed. When all credits have been posted, the settlement for that file is complete and an acknowledgement message is sent to the settlement agent.

The NSS business day begins at 08:30 and ends at 17:00 ET, Monday through Friday, excluding designated holidays. Under certain circumstances, hours can be extended. Files submitted earlier than 08:30 ET are queued for processing beginning at 08:30 ET.

3.2.3.5 *Risk management*

Intraday central bank credit in the form of daylight account overdrafts may be available to NSS settlers to mitigate the liquidity risks they face intraday. In addition, immediate settlement finality and the ability for settlement agents to fund settlement accounts using the Fedwire Funds Service enable NSS settlers to manage their credit and liquidity risks. The Federal Reserve Banks manage operational risk using the tools discussed in Section 3.2.1.5.

The primary source of liquidity risk to participants in an NSS arrangement is the inability of a settler to fund its debit balance. If a settler has insufficient funds to fund its balance, the agent is contacted and must either request that the rejected debit balance be re-processed, arrange for the amount of the rejected balance to be transferred to the settlement account via the Fedwire Funds Service or cancel the settlement file.

3.3 Retail payment systems

3.3.1 Cheque clearing systems

Depository institutions paid an estimated 22.8 billion cheques in the United States during 2010. Approximately 26% of those cheques were deposited in the same institution on which they were drawn (ie “on-us” cheques) and, therefore, were settled via accounting entries on the books of the paying institution. The remaining 74% were cleared and settled through interbank mechanisms. Approximately 52% of the cheques cleared through interbank mechanisms were cleared through direct exchange (presentment), local cheque clearing houses and correspondent bank networks; the rest were cleared through the Federal Reserve Banks.

3.3.1.1 Operation of the cheque collection mechanism

In the wake of the Check 21 Act (see Section 2.2.1.1), the vast preponderance of interbank cheque clearing arrangements are now electronic. Accordingly, much of the infrastructure formerly used to process and deliver paper cheques between banks has ceased to exist. For example, as recently as 2003 the Federal Reserve Banks managed 45 cheque clearing centres. By February 2010, the Reserve Banks had ceased operations at all but one of these paper cheque processing centres. The Reserve Banks have also discontinued their air transportation networks for cheques. In addition, many of the private arrangements for exchanging paper cheques, including local clearing houses and ground courier services, have been discontinued.

Typically the first depository institution to receive a paper cheque “truncates” that cheque, using scanning equipment to capture both an image of the cheque and the information contained in the magnetic ink character recognition (MICR) line printed along the bottom of the cheque. A paper cheque may even be truncated prior to its receipt by the first bank that handles the item. For example, in a process known as “remote deposit capture”, a cheque’s payee, such as a merchant, uses scanning equipment at the point of sale to capture the aforementioned data elements from the paper cheque and, by agreement, deposits the cheque electronically with its bank.

Once a paper cheque has been truncated, banks typically handle the item electronically thereafter. A bank may collect an electronic item by depositing it with a correspondent bank or a Federal Reserve Bank. Correspondent banks that have established relationships with other correspondent banks may present electronic items drawn on each other directly. Smaller institutions generally use the electronic cheque handling services offered by clearing houses, correspondent banks or the Federal Reserve Banks. If necessary, as authorised by the Check 21 Act, a bank handling an electronic item may create a legally equivalent paper substitute cheque for delivery to a subsequent bank or bank customer that does not accept cheques electronically.

While the Check 21 Act has radically transformed the means by which cheques are cleared in the United States, it has not had a substantial effect on the settlement of cheques. Correspondent banks settle the cheques they collect for other institutions through accounts on their books. Paying banks generally settle with correspondent banks using the Federal Reserve’s Fedwire Funds Service. Cheque clearing houses generally net payments. Settlement among cheque clearing house participants generally occurs through direct transactions between members, through designated settlement banks or through the Federal Reserve’s NSS.

The Federal Reserve settles the cheques it collects by posting entries to the accounts that depository institutions maintain with the Federal Reserve. The account of the collecting institution is credited, and the account of the paying institution is debited, for the value of the deposited cheques in accordance with funds availability schedules maintained by the Federal Reserve, which reflect the time normally needed for the Federal Reserve to receive

settlement from the paying institutions. Collecting institutions usually receive credit on the day of deposit or the next business day.

3.3.2 Automated clearinghouse (ACH)

ACH is a nationwide electronic file transfer mechanism that processed 19.2 billion credit and debit transfers initiated by depository institutions through electronically originated batches during 2010. The Federal Reserve is one of the nation's two ACH operators; The Clearing House's Electronic Payments Network (EPN) is the sole private sector ACH operator.

3.3.2.1 Operation of the ACH system

The Federal Reserve maintains centralised application software used to process ACH payments submitted to the Federal Reserve Banks through the FedACH system. Depository institutions electronically deliver files to and receive files from the Federal Reserve Banks through a variety of electronic-access options. EPN and the Federal Reserve Banks rely on each other for the processing of ACH transactions in which either the originating depository institution or the receiving depository institution is not their customer. These inter-operator transactions are settled by the Federal Reserve.

ACH transactions processed by the Federal Reserve are settled through depository institutions' accounts at the Federal Reserve. Settlement for ACH credit transactions processed by the Federal Reserve Banks is final when transactions are posted to the receiving depository institutions' accounts, which is currently at 08:30 ET on the settlement date. Credit for Federal Reserve ACH debit transfers is not final at settlement. Credit for debit items is available to the originating depository institution on the settlement date but is not final until the banking day following the settlement date. FedACH is governed by Operating Circular 4, which, subject to certain exceptions, incorporates the Operating Rules of NACHA (see Section 1.3.2). Transactions processed by EPN are settled on a net basis using the National Settlement Service.

3.3.3 Payment card networks

Credit card and debit card networks provide communications, transaction authorisation and interbank financial settlement for financial institutions. Payment card networks establish uniform operating policies, procedures and controls. Some major networks are publicly traded companies. The largest credit card and signature-based debit card networks in the United States are Visa and MasterCard. American Express and Discover are also major card networks. There were also several smaller debit card networks operating in the United States during 2010.

3.3.3.1 Operation of payment card networks

Credit card and debit card networks sort and route transaction data from acquiring banks to issuing banks over proprietary networks. The networks generally settle on a net basis with the acquiring and issuing banks daily, although typically with a one- or two-day lag between payment initiation and settlement. Generally, the networks use the acquiring and issuing banks' aggregated transaction information to compile each bank's net settlement position. Member banks may be required to maintain collateral with the networks' settlement banks to manage default risks. Acquiring and issuing banks may settle directly with each other, through regional settlement banks or through the Federal Reserve or by other net settlement arrangements. The settlement process can vary significantly, depending upon the banks involved.

4. Systems for post-trade processing, clearing and settlement

4.1 General overview

In the United States, a number of systems facilitate the post-trade processing, clearing and settlement of securities, derivatives and other financial transactions. These currently include trade repositories as well as central counterparties, central securities depositories and securities settlement systems.

4.2 Trade repositories

4.2.1 DTCC Data Repository (US) LLC

4.2.1.1 Institutional framework

DTCC Data Repository (US) LLC (DDRL US) is a wholly owned subsidiary of the Depository Trust & Clearing Corporation (DTCC) that operates a multi-class swaps data repository for the over-the-counter (OTC) equities, credit, interest rate and foreign exchange derivatives markets. DDRL US plans on supporting commodities derivatives in the future. DDRL US maintains an electronic database containing authoritative and timely data on derivatives contracts for the asset classes that it serves.

4.2.1.2 Participation

DDRL US provides open access to all participants in these OTC derivatives markets, including swap execution facilities, designated contract markets, derivatives clearing organisations (DCOs), confirmation providers and middleware providers in an effort to promote processing and regulatory reporting efficiency.

4.2.1.3 Types of transactions

DDRL US is part of DTCC's global trade repository (GTR) service that supports cleared and uncleared OTC equities, credit, interest rate, foreign exchange and commodity derivatives. The GTR service is utilised by two other trade repositories in addition to DDRL US: (i) DTCC Derivatives Repository Limited (DDRL Ltd), a UK company; and (ii) Global Trade Repository for Commodities BV (GTRfC), a Dutch company. GTR is serviced by other DTCC subsidiaries, including the Warehouse Trust Company, a state-chartered, limited-purpose trust company in New York and a member of the Federal Reserve System, that provides post-trade lifecycle event processing to trade repositories servicing the credit default swap market. DDRL US also has links to the DCOs that choose to satisfy CFTC swap transaction reporting requirements under the Commodity Exchange Act.

4.3 Central counterparties (CCPs) and clearing systems

4.3.1 National Securities Clearing Corporation (NSCC)

4.3.1.1 Institutional framework

The National Securities Clearing Corporation provides central counterparty clearing and settlement services for various securities transactions in the United States. NSCC is a wholly owned subsidiary of DTCC and is registered as a clearing agency with, and subject to regulation and supervision by, the SEC. Also, NSCC has been designated as systemically important by the FSOC, and under Title VIII of the DFA the SEC is its supervisory agency.

4.3.1.2 Participation

NSCC participants include brokers/dealers, banks, other clearing agencies, investment companies, insurance companies and other similar entities. NSCC clears transactions for a number of exchanges, electronic communication networks (ECNs) and other trading venues. These trading venues include the New York Stock Exchange (NYSE), the NASDAQ Stock Market and regional US markets, as well as OTC markets in municipal government bonds and other securities.

4.3.1.3 Types of transactions

NSCC provides clearing and settlement services for broker-to-broker trades involving equities, corporate and municipal debt, American depository receipts, exchange-traded funds and unit investment trusts. In 2010, NSCC processed around 20 billion transactions, valued at approximately USD 218 trillion.

4.3.1.4 Operation of the system

NSCC functions as a CCP for the equities and corporate and municipal bond markets. Equities trade over exchanges or ECNs; corporate and municipal bonds trade over the counter. Trading activity, regardless of trade source, enters NSCC on trade date (T) and final settlement occurs three days after (T+3).²¹ In its clearing process, NSCC conducts a multilateral net of its members' trade positions, resulting in a net long (buy) or net short (sell) position in each traded security for each member and a single overall net funds position for each member. NSCC maintains a settlement account at the Depository Trust Company (DTC) to allow settlement of net securities obligations.²²

On settlement date (T+3), NSCC's continuous net settlement (CNS) system instructs DTC to deliver available securities from members with net delivery obligations to NSCC's settlement account and then deliver those securities to members with net receive obligations. These securities deliveries are made free of payment within DTC and are provisional intraday (with respect to the receiver) until end-of-day payment (approximately 16:30 ET) is made over NSS.²³ The DTC and NSCC end-of-day net funds settlement process is executed over a single NSS file. Each DTC and NSCC member must designate a settling bank that participates in the DTC-NSCC NSS arrangement. DTC and NSCC calculate a net-net funds settlement obligation for their common members by netting their separate DTC and NSCC net funds obligations.

4.3.1.5 Risk management

NSCC establishes requirements for participants' financial resources and creditworthiness. Financial requirements are generally based upon the entity type of a participant (eg broker/dealer, bank/trust company etc), types of services that the entity will use (eg full use of continuous net settlement, limited use of non-guaranteed services etc) and whether the entity intends to clear transactions for others. In addition, NSCC maintains sufficient resources, primarily member clearing fund deposits, to cover the failure of the member (including the member's affiliated family) having the largest net debit in extreme but plausible market conditions. NSCC's clearing fund calculation includes daily mark to market charges, which measure the unrealised profit or loss in participants' portfolios using contract prices versus market prices of the securities that NSCC clears.

²¹ Trade information sources include automatic transmission from exchanges and ECNs.

²² Settlement over DTC is described in Section 4.4.2.

²³ Deliveries to members with net funds credit positions (sell obligations greater than buy obligations) will be final intraday once successful delivery of sell obligations has occurred.

NSCC's liquid resources include participant cash contributions to NSCC's clearing fund and the cash that would be obtained from NSCC's committed liquidity facility with a consortium of banks. When drawn upon, the committed liquidity facility would be collateralised with participant securities contributions to NSCC's clearing fund and unpaid CNS long allocations (or collateral supporting those allocations) of the defaulting member. Securities in NSCC's clearing fund consist of US Treasury and agency securities. In the event that a member fails to pay its net funds obligation to NSCC, the CCP is obliged to make payment to its surviving members for the securities they delivered to NSCC to be on-delivered to the failing member. NSCC would need to draw on its liquid resources and/or convert the delivered securities (which the DTC system would make available to NSCC) and/or its other financial resources into cash to make this payment. If losses are incurred in the liquidation of a defaulting member's positions, NSCC would first use that member's clearing fund deposit to cover a loss incurred on the liquidation (and any funds available from any applicable collateral-sharing arrangements with other clearing corporations).

In the event that a defaulting member's clearing fund deposits were insufficient to cover the liquidation of all positions, NSCC would draw from resources available under applicable cross-guaranty agreements and from no less than 25% of the retained earnings attributable to NSCC. If a deficiency still remained, NSCC would satisfy the deficiency by utilising the clearing fund deposits of surviving members and assessing its members as provided in its rules. The assessment process, in general, allocates any remaining losses pro rata among members based upon the member's usage of the service to which the loss relates.²⁴

4.3.1.6 Links to other systems

NSCC maintains a securities settlement account at DTC to allow settlement of net securities obligations. DTC also acts as settlement agent for NSCC to effect net funds settlement over NSS through a single NSS file. Each DTC and NSCC member designates a settling bank that participates in the DTC-NSCC NSS arrangement.

NSCC has entered into a multilateral netting contract and limited cross-guaranty agreement with DTC, the Fixed Income Clearing Corporation (FICC) and The Options Clearing Corporation (OCC), under which these clearing agencies have agreed to make payments to each other for any remaining unsatisfied obligations of a common defaulting participant to the extent that these clearing agencies have excess resources belonging to the defaulting participant.

4.3.2 Fixed Income Clearing Corporation – Government Securities Division (FICC/GSD)

4.3.2.1 Institutional framework

The Government Securities Division of the Fixed Income Clearing Corporation provides central counterparty clearing and settlement services for transactions in US Treasury and agency securities. FICC is a wholly owned subsidiary of DTCC.²⁵ FICC is registered as a clearing agency with and is subject to regulation and supervision by, the SEC. Also, FICC has been designated as systemically important by the FSOC, and under Title VIII of the DFA the SEC is its supervisory agency.

²⁴ Members may cap their exposure to future allocations by electing to withdraw from membership within certain timeframes.

²⁵ FICC also operates its Mortgage-Backed Securities Division (FICC/MBSD) which is described in Section 4.3.3.

4.3.2.2 Participation

FICC/GSD rules allow for the following types of netting members: banks, broker/dealers, futures commission merchants (FCMs), interdealer brokers, government securities issuers, registered clearing agencies, insurance companies and registered investment companies. Foreign entities may become netting members if (i) their home country regulator has entered into a memorandum of understanding with the SEC and (ii) they maintain a US presence. Registered investment companies also may join as sponsored members.

4.3.2.3 Types of transactions

FICC/GSD provides clearing and settlement services for US government securities, including Treasury bills, bonds, notes, zero-coupon securities, government agency securities and inflation-indexed securities. FICC/GSD accepts buy-sell transactions, repurchase and reverse repurchase agreement transactions (repos) and Treasury auction purchases in eligible securities. FICC/GSD also provides General Collateral Finance Repo (GCF Repo) services. The US government securities market is predominantly an over-the-counter market. In 2010, FICC/GSD processed around 34 million transactions with a total value of approximately USD 1.1 quadrillion.

4.3.2.4 Operation of the system

FICC/GSD functions as a CCP for the US government securities market and provides the Real-Time Trade Matching (RTTM) service to its participants. RTTM provides immediate confirmation for submitted trade executions that is legal and binding. FICC/GSD members may submit their trades through interdealer brokers or directly to FICC/GSD.²⁶ Interdealer brokers are specialised securities companies that function as intermediaries to facilitate transactions between broker/dealers.

Through multilateral netting, FICC/GSD establishes a single net long (buy) or net short (sell) position for each member's daily trading activity in a given security. The member's net position is the difference between all purchases (long) and all sales (short) in a specific security. FICC/GSD legally novates each net settlement position and members settle against FICC/GSD as CCP.

US government securities market transactions are generally settled on a T+1 basis. FICC employs the services of two settlement banks, the Bank of New York Mellon (BNYM) and JPMorgan Chase Bank (JPMC) for the purposes of settling transactions. FICC/GSD rules provide that FICC/GSD shall notify each member which settlement bank(s) FICC/GSD will use to deliver eligible securities to members and to receive eligible securities from members, and, by product, the types of securities that each such clearing bank will deliver and receive. In turn, each member must notify FICC/GSD of the bank(s) that the member has designated to act on its behalf in the delivery and receipt of securities to and from FICC/GSD.

4.3.2.5 Risk management

FICC/GSD establishes requirements for participants' financial resources and creditworthiness. FICC/GSD maintains membership standards, including minimum financial requirements. Financial requirements are generally based upon entity type, types of services that the participant will use and whether the participant intends to clear transactions for others. In addition, FICC maintains financial resources, primarily member clearing fund

²⁶ Dealers that are not FICC members or that do not use an interdealer broker to submit trades to FICC may settle their trades on a gross basis either on the books of a depository institution or through the Fedwire Securities Service, described in Section 4.4.1 below, via a depository institution. Non-member dealers may also submit trades to FICC through a dealer member with which they have a correspondent relationship.

deposits, sufficient to cover the failure of its largest member (including the member's affiliated family). The clearing fund consists of deposits posted by members in the form of cash and eligible securities (US Treasury securities, agency securities guaranteed by the US government and pass-through mortgage-backed securities by Ginnie Mae, Fannie Mae and Freddie Mac). FICC/GSD's liquid resources include cash contributions to FICC/GSD's clearing fund.

FICC/GSD marks all open positions, including forward settling and delivery fails, to market twice daily as part of its funds-only settlement process. Among other payments included in FICC/GSD's funds only settlement are repo interest rate marks, delivery differential payments and coupon payments.

FICC/GSD's rules include a loss allocation procedure, which would be invoked if a defaulting member's clearing fund deposit was insufficient to cover losses incurred in the liquidation of the member's positions. If a member becomes insolvent, FICC/GSD would first use that member's clearing fund to cover the loss incurred on the liquidation of the member's positions (and any funds available from any applicable collateral sharing arrangements with other clearing corporations). If those deposits were insufficient to cover the liquidation of all positions, the remaining loss would be allocated against the retained earnings of FICC attributable to the FICC/GSD in the amount of up to 25% of the retained earnings or such higher amount as may be approved by the Board of Directors of FICC. If a further loss remained, FICC/GSD would apply the loss to the clearing fund deposits of its non-defaulting members in accordance with its rules.

4.3.2.6 Links to other systems

FICC/GSD uses its two settlement banks, BNYM and JPMC, for the purposes of settling transactions and custody of collateral posted to FICC/GSD's clearing fund. FICC/GSD uses DTC its settlement agent to execute its funds-only settlement over NSS.

FICC has entered into a multilateral netting contract and limited cross-guaranty agreement with DTC, NSCC and OCC, under which these clearing agencies have agreed to make payments to each other for any remaining unsatisfied obligations of a common defaulting participant to the extent that these clearing agencies have excess resources belonging to the defaulting participant.

FICC has also entered into a cross-margining agreement with the Chicago Mercantile Exchange Inc (CME) which provides for coordination between the two clearing corporations in the event of a default of a cross-margining participant. In addition, FICC has a single-pot cross-margining agreement with New York Portfolio Clearing (NYPC).²⁷

²⁷ On 1 March 2011, FICC/GSD received SEC approval to enter into a single-pot cross-margining with New York Portfolio Clearing, a joint-venture between DTCC and NYSE Euronext. On 1 February 2011, NYPC received CFTC approval for registration as a DCO. In March 2011, NYPC went live and currently provides central counterparty clearing and settlement services for various interest rate products, including Treasury and Eurodollar futures. NYPC executes its pass-through payments in conjunction with FICC/GSD's NSS pass-through arrangement, netting the obligations of common members. Futures contracts that cash settle upon expiration settle through this same NSS arrangement. Futures contracts that are physically settled (a Treasury security is delivered against payment upon the expiration of the contract) are converted into FICC/GSD delivery obligations.

4.3.3 Fixed Income Clearing Corporation – Mortgage-Backed Securities Division (FICC/MBSD)

4.3.3.1 Institutional framework

The Mortgage-Backed Securities Division of the Fixed Income Clearing Corporation provides trade guaranty, and central counterparty clearing and settlement services for the mortgage-backed securities (MBS) market.²⁸ These services are provided to FICC/MBSD members that trade in the forward and over-the-counter options markets for MBS issued by Government National Mortgage Association (Ginnie Mae), Federal National Mortgage Association (Fannie Mae) and Federal Home Loan Mortgage Corporation (Freddie Mac).

4.3.3.2 Participation

FICC/MBSD rules allow for the following types of netting members: banks, broker/dealers, interdealer brokers, issuers of eligible securities, registered clearing agencies, insurance companies, registered investment companies and unregistered investment pools.

4.3.3.3 Types of transactions

FICC/MBSD provides clearing and settlement services for Ginnie Mae, Fannie Mae and Freddie Mac pass-through MBS, all of which trade over the counter. In 2010, FICC/MBSD processed around 3 million transactions with a total value of approximately USD 104 trillion.

4.3.3.4 Operation of the system

MBS generally trade on a to-be-announced (TBA) basis, meaning the general terms of the trade are known, but the specific pools of mortgages that the seller will deliver are unknown at the time of trade. FICC/MBSD members may submit their trades through interdealer brokers or directly to FICC/MBSD.²⁹ FICC/MBSD members enter their trade information into FICC/MBSD on the trade date. Settlement of associated obligations typically occurs on one of four monthly settlement dates established by the Securities Industry and Financial Markets Association. Many MBS settle on the next appropriate settlement date, but often market participants choose to settle in a later month.

FICC/MBSD nets TBA trades by TBA CUSIP, creating TBA settlement obligations three days before settlement date (S–3). The netting process also assigns settlement counterparties for each position, which may or may not be original trade counterparties. On S–2, FICC/MBSD members communicate to FICC/MBSD and one another the specific mortgage pools they will deliver to meet their TBA settlement obligations. On S–1, FICC/MBSD nets and novates a subset of the mortgage pools to be delivered based on an optimisation algorithm. On settlement date (S), members whose delivery obligations FICC/MBSD novated settle against FICC/MBSD; otherwise, members settle non-novated obligations bilaterally outside FICC/MBSD and provide FICC/MBSD notification of settlement.

²⁸ FICC, a wholly-owned subsidiary of DTCC, also operates the Government Securities Division (FICC/GSD). As described in Section 4.3.2, FICC is registered as a clearing agency with the SEC and is subject to SEC regulation and supervision. Also, FICC has been designated as systemically important by the FSOC, and under Title VIII of the DFA the SEC is its supervisory agency.

²⁹ Dealers that are not FICC members or that do not use an interdealer broker to submit trades to FICC may settle their trades on a gross basis either on the books of a depository institution or through the Fedwire Securities Service via a depository institution. Non-member dealers may also submit trades to FICC through a dealer member with which they have a correspondent relationship.

4.3.3.5 Risk management

FICC/MBSD provides risk management services to its members to mitigate risks inherent in the settlement process, including the possibility of member default. Among the tools that FICC/MBSD employs to manage risk are participation requirements, clearing fund requirements and daily mark to market of open positions. FICC/MBSD accepts cash and eligible securities (same as FICC/GSD) for deposit in the clearing fund. FICC/MBSD's clearing fund is calculated, collected and held separately from that of FICC/GSD. In addition, FICC/MBSD employs a loss allocation procedure similar to that of FICC/GSD (as described in Section 4.3.2.5).

4.3.3.6 Links to other systems

FICC/MBSD uses DTC as its settlement agent to execute its funds only settlement over the National Settlement Service. FICC has entered into a multilateral netting contract and limited cross-guaranty agreement with DTC, NSCC and OCC under which these clearing agencies have agreed to make payments to each other for any remaining unsatisfied obligations of a common defaulting participant to the extent that these clearing agencies have excess resources belonging to the defaulting participant.

4.3.4 The Options Clearing Corporation (OCC)

4.3.4.1 Institutional framework

The Options Clearing Corporation is an independent clearing house for exchange-traded equity options and commodity futures. OCC currently provides central counterparty clearing and settlement services to nine options exchanges and five futures markets.³⁰ OCC is owned in equal shares by five of its participant exchanges.³¹ OCC is registered as a clearing agency with and is subject to regulation and supervision by the SEC. OCC is also registered as a DCO and regulated by the CFTC. Also, OCC has been designated as systemically important by the FSOC, and under Title VIII of the DFA the SEC is its supervisory agency.

4.3.4.2 Participation

Eligible clearing firms must be broker/dealers registered with the SEC, FCMs registered with the CFTC or non-US securities firms that meet certain financial, operational and regulatory requirements outlined in OCC's rules and bylaws. Non-US securities firms must be incorporated, located and regulated within another country. OCC requires clearing members to maintain minimum net capital levels at all times. OCC has approximately 120 clearing members.

4.3.4.3 Types of transactions

OCC offers clearing and settlement services for transactions in options on several types of underlying assets, including stocks, stock indices, exchange-traded fund (ETF) shares and foreign currencies traded on OCC's participant exchanges and markets. OCC also offers clearing and settlement services for transactions in futures and options on futures on several types underlying assets, including commodities, stocks, stock indices, ETF shares, foreign

³⁰ These exchanges and markets include: BATS; Boston Options Exchange; C2 Options Exchange, Inc; Chicago Board Options Exchange, Incorporated; International Securities Exchange, LLC; NASDAQ OMX PHLX; NASDAQ Options Market; NYSE Amex Options; NYSE Arca Options; CBOE Futures Exchange, LLC; ELX Futures, LP; NASDAQ OMX Futures Exchange; NYSE Liffe US; and OneChicago Exchange.

³¹ OCC is owned by the NYSE Amex Options, the Chicago Board Options Exchange, Inc, the International Securities Exchange, LLC, the NASDAQ OMX PHL and NYSE Arca.

currencies, volatility indices and US Treasury securities. In addition, OCC provides clearing services for securities lending transactions. In 2010, OCC cleared approximately 3.9 billion options contracts and 26.6 million futures contracts.

4.3.4.4 *Operation of the system*

OCC clears and guarantees options and futures contracts. OCC receives matched trade data for trades executed on one of the 14 exchanges or platforms for which it provides clearing services. When a trade is accepted for clearing, OCC is substituted as the counterparty to every buyer and seller through the process of novation and guarantees performance on the contract.

Each morning OCC settles payment obligations incurred on the previous business day. These payments include options premiums passed from buyer to seller and margin deposits.³² OCC requires that all payments due be received by 10:00 ET and is obligated to make all required payments to clearing participants by 11:00 ET.

Settlement occurs through settlement banks designated by OCC. Clearing members must establish a banking relationship with one of the settlement banks designated by OCC, which also has an account at each bank. OCC and its clearing members grant settlement banks the authority to credit or debit their respective accounts based on settlement instructions sent by OCC.

4.3.4.5 *Risk management*

OCC bears counterparty credit risk in the event that clearing members fail to meet their obligations.³³ OCC reduces its exposure through a risk management programme that includes initial and ongoing membership standards, margin requirements, a clearing fund of highly liquid assets and lines of credit to enable OCC to meet clearing member default or suspension obligations, or to cover certain other losses. All trades guaranteed by OCC are matched, which ensures that it has equal and offsetting claims against clearing members. Margin and clearing fund deposits are required to collateralise clearing members' obligations and thus support OCC's guarantee.

OCC sets margin requirements based on a member's overall portfolio risk in options, futures and stock loan/borrow positions. OCC requires the posting of initial margin in order to guarantee a contract. Initial margin deposits must be in the form of cash, government securities, government-sponsored debt, letters of credit, money market fund shares or other acceptable margin securities and may be subject to haircuts. In addition, OCC marks all open contracts to market on a daily basis and requires additional cash payments (known as variation margin) to cover changes in contract value. Margin requirements are calculated using the System for Theoretical Analysis and Numerical Simulations (STANS), a proprietary risk management system that uses Monte Carlo-based simulation techniques.³⁴

OCC also maintains a clearing fund to cover possible losses should a clearing member, bank or a securities or commodities clearing organisation default. The clearing fund is a percentage of the average daily aggregate margin requirement for positions outstanding during the preceding calendar month and mutualises the risk of default among all clearing

³² OCC requires both initial margin deposits and variation margin deposits to cover changes in contract value.

³³ OCC deals only with its clearing members and holds each clearing member accountable for all positions, regardless of whether the positions are for the member itself or customers of the member.

³⁴ The Monte Carlo method is used to build a portfolio profit and loss distribution by repeatedly simulating price movements and their associated results.

members.³⁵ The entire clearing fund is available to cover potential losses in the event that the margin deposit and the clearing fund deposit of a defaulting clearing member are inadequate or not immediately available to fulfil that clearing member's outstanding financial obligations. In the event of a default, OCC is generally required to liquidate the defaulting clearing member's open positions. To the extent that such positions remain open, OCC is required to assume the defaulting clearing member's obligations related to the open positions. The clearing fund is available to cover the cost of liquidating a defaulting clearing member's open positions and performing OCC's obligations with respect to positions not yet liquidated.³⁶

4.3.4.6 Links to other systems

OCC currently maintains cross-margining arrangements with certain US commodities clearing organisations, including the CME and ICE Clear US, as well as offering an internal cross-margin programme for products where OCC clears both securities and futures contracts. In addition, OCC has entered into a multilateral netting contract and limited cross-guaranty agreement with DTC, NSCC and FICC under which these clearing agencies have agreed to make payments to each other for any remaining unsatisfied obligations of a common defaulting participant to the extent that these clearing agencies have excess resources belonging to the defaulting participant.

The OCC also participates in the Disbursement Programme, developed jointly with DTC and NSCC, which facilitates the payment of stock settlement obligations of common OCC clearing members and NSCC participants resulting from exercised and assigned equity options.

4.3.5 CME Clearing

4.3.5.1 Institutional framework

CME Clearing is an unincorporated division of the Chicago Mercantile Exchange, Inc (CME), which is a subsidiary of CME Group Inc and provides central counterparty clearing and settlement services for exchange-traded futures and options contracts traded on CME Group exchanges (as defined in Section 4.3.5.3) and certain OTC derivatives contracts. CME Clearing is a registered DCO regulated by the CFTC. Also, CME has been designated as systemically important by the FSOC, and under Title VIII of the DFA the CFTC is its supervisory agency.

4.3.5.2 Participation

Eligible clearing members are corporations, partnerships or cooperative associations that own shares of CME Group and have sufficient financial capital to support the risks assumed in clearing trades. Clearing members must be registered as futures commission merchants with the CFTC in order to clear customer trading activity. CME Clearing has approximately 64 clearing members.

4.3.5.3 Types of transactions

CME Clearing clears exchange-traded futures and options contracts traded on the CME; the Board of Trade of the City of Chicago, Inc (Chicago Board of Trade, or CBOT); the New York

³⁵ The SEC has approved a proposed change to OCC's method for calculating the size of its clearing fund. OCC will size the clearing fund to cover the larger of the charges that would result from (i) a default by a single clearing member group or (ii) the near simultaneous default of two randomly selected clearing members.

³⁶ Clearing fund deposits must be in the form of cash or government securities (as defined in OCC's bylaws) as the clearing fund is intended to provide OCC with an immediately available pool of liquid assets.

Mercantile Exchange, Inc (NYMEX); and the Commodity Exchange, Inc (COMEX), which are collectively referred to as the “CME Group exchanges”. CME Clearing also clears OTC derivatives contracts submitted for clearing through CME ClearPort. CME Group handled around 3.1 billion contracts in 2010.

4.3.5.4 *Operation of the system*

CME Clearing functions as a CCP for the futures and options contracts it clears. CME Clearing matches trade data submitted for trades executed either through open outcry facilities located in Chicago and New York or the CME Globex electronic trading facility as well as for privately negotiated OTC derivatives transactions. When a trade clears, CME Clearing is substituted as the counterparty to every buyer and seller and guarantees performance on the contract.

CME Clearing marks open contracts to market twice daily and settles payment obligations once in the morning and once in the afternoon of each business day. Morning settlement occurs at 08:30 ET and includes options premiums passed from buyer to seller and initial and variation margin (also known as initial and maintenance performance bonds, respectively) deposits. CME Clearing sends payment instructions to each settlement bank prior to the 08:30 ET deadline and requests a confirmation of payment prior to the deadline. Afternoon settlement includes maintenance performance bond deposits, which are due within one hour of CME Clearing requesting payment from its clearing members.

Settlement occurs through designated settlement banks that act as settlement intermediaries between CME Clearing and its clearing members. Clearing members must establish a banking relationship with one of the settlement banks designated by CME Clearing, which also has an account at each bank.³⁷ CME Clearing and clearing members grant settlement banks the authority to credit or debit their respective accounts for daily market activity based on clearing instructions sent by CME Clearing.

4.3.5.5 *Risk management*

CME Clearing bears counterparty credit risk in the event that future market movements create conditions that could lead to clearing firms failing to meet their obligations to the clearing house.³⁸ CME Clearing reduces its exposure through a risk management programme that includes initial and ongoing financial standards, initial and maintenance performance bond (margin) requirements, mandatory guaranty funds contributions and lines of credit.

CME Clearing sets minimum performance bond requirements based on the product traded and market volatility. Performance bond requirements are calculated for each instrument separately using the CME’s Standard Portfolio Analysis of Risk (SPAN) system for futures and options contracts, a historical value-at-risk (VaR) model for interest rate swaps and a multifactor model for credit default swaps. Performance bond collateral may include cash, gold, US Treasury securities, US government agency securities, foreign sovereign debt, select mortgage-backed securities, specialised collateral programmes, letters of credit and stocks and may be subject to haircuts. CME Clearing also marks to market all open positions at least twice a day, and more often if market volatility warrants, and requires payments from

³⁷ Clearing members must establish separate accounts at settlement banks for customer and house (non-customer and proprietary) activity.

³⁸ CME Clearing is also exposed indirectly to the credit risk of customers of its clearing firms as clearing members are held accountable for all positions, regardless of whether the positions are for the member itself or customers of the member.

clearing firms whose positions have lost value and makes payments to clearing firms whose positions have gained value.

CME Clearing has measures in place intended to enable it to cover any single default and maintain liquidity. In the event of a default by a clearing firm, CME Clearing would first apply assets of that clearing firm to cover its obligations to CME Clearing. These assets include guaranty fund contributions, performance bonds and any other available assets, such as proceeds from the sale of Class A common stock and trading rights (at CME, CBOT, NYMEX and/or COMEX, as applicable) owned by or assigned to the clearing firm.³⁹ Thereafter, if the default remains unsatisfied, CME Clearing would use its surplus funds, guaranty fund contributions of other clearing firms and funds collected through an assessment against all other solvent clearing firms to satisfy the deficit.⁴⁰

4.3.5.6 Links to other systems

CME Clearing offers a cross-margining programme with OCC and FICC. CME Clearing is also involved in the Mutual Offset System Agreement (MOSA) between CME and the Singapore Exchange Ltd (SGX), which enables traders to open a futures position on one exchange and liquidate it on the other.

4.3.6 ICE Clear Credit LLC

4.3.6.1 Institutional framework

ICE Clear Credit LLC (ICE Clear Credit) is a limited liability company and provides central counterparty clearing and settlement services for credit default swaps referencing the CDX North American investment-grade, investment-grade high volatility and high-yield indexes (North American index contracts) and a subset of their single-name constituents (North American single-name contracts). In addition, ICE Clear Credit also provides central counterparty clearing and settlement services for Latin American sovereign credit default swaps. ICE Clear Credit is a subsidiary of IntercontinentalExchange Inc (ICE), a publicly traded company which operates futures exchanges, over-the-counter swaps markets and derivatives clearing houses.

ICE Clear Credit was formerly known as ICE Trust US LLC (ICE Trust), and was regulated by the Federal Reserve and the New York State Department of Financial Services. On 16 July 2011, ICE Trust converted from a New York state trust company to a Delaware limited liability company and changed its name to ICE Clear Credit LLC. On the same day, pursuant to the DFA, ICE Trust began operating under the name ICE Clear Credit, subject to regulation by the CFTC and SEC as a DCO and clearing agency, respectively. Also, ICE Clear Credit has been designated as systemically important by the FSOC, and under Title VIII of the DFA the CFTC is its supervisory agency.

4.3.6.2 Participation

Participants in ICE Clear Credit include broker/dealers registered with the SEC, futures commissions merchants registered with the CFTC and banks. ICE Clear Credit has approximately 27 clearing participants.

³⁹ In addition, CME Clearing would make a demand for payment pursuant to any applicable guarantee provided to the exchange by the parent of a clearing firm.

⁴⁰ CME Clearing separately accounts for and segregates clearing members' positions and monies from its own.

4.3.6.3 *Types of transactions*

Contracts eligible for clearing include certain North American index contracts and North American single-name contracts and Latin American sovereign contracts. Once the contracts are cleared, they are recorded in the trade information warehouse for credit derivatives operated by Warehouse Trust.

4.3.6.4 *Operation of the system*

ICE Clear Credit manages a weekly and daily workflow to clear contracts, requiring the execution of a number of steps by clearing members and the clearing house. The weekly workflow begins with clearing members designating for clearing eligible bilateral contracts registered in Warehouse Trust. Throughout the week, the list of contracts designated for clearing may be modified. The clearing process results in the novation of the bilateral contracts whereby ICE Clear Credit interposes itself between the counterparties to the original CDS contract. Clearing members are provided with margin requirements on cleared positions. The daily workflow allows clearing members to clear new trades on the same day they are executed. The process begins when two clearing members submit the trade for clearing immediately upon trade execution. Once the trade passes a risk management assessment by the clearing house, the trade is accepted for clearing. The trade is then registered in Warehouse Trust, and clearing members are provided with margin requirements on cleared positions. Finally, ICE Clear Credit has developed a workflow for third parties to indirectly clear North American index contracts with ICE Clear Credit via a client relationship with a clearing member.

4.3.6.5 *Risk management*

ICE Clear Credit has a risk management framework to manage the risk associated with clearing CDS contracts. The risk management framework is based on a tiered approach. First, ICE Clear Credit maintains membership criteria, which establish minimum levels of financial resources, operational capabilities and risk management experience for clearing members. Second, ICE Clear Credit requires initial margin on open positions to cover potential clearing member portfolio losses in normal market conditions. Third, ICE Clear Credit requires mark to market margin on open positions, reflecting the market loss or gain on each clearing member's portfolio of cleared positions. Fourth, clearing members must contribute additional financial resources to a guaranty fund. The guaranty fund is sized to cover potential portfolio losses in extreme but plausible market conditions; ICE Clear Credit contributes to this fund. Fifth, ICE Clear Credit has the ability to impose a limited one-time assessment on each of its clearing members in the event the guaranty fund is exhausted.

4.3.6.6 *Links to other systems*

ICE Clear Credit supports the delivery of trades to the clearing house via a number of trade execution and matching systems including ICE Link, MarkitWire and TradeWeb. As explained above, ICE Clear Credit has a link with Warehouse Trust to identify trades eligible for clearing.

4.3.7 *Other clearing systems*

Other domestic and foreign systems also clear transactions in US markets. Domestic clearing systems include MGE Clearing, the Kansas City Board of Trade, ICE Clear US, and New York Portfolio Clearing. Foreign clearing systems for derivatives that do business with US persons are registered as derivatives clearing organisations with the CFTC include LCH.Clearnet Ltd, ICE Clear Europe Ltd and Eurex Clearing AG.

4.4 Securities settlement systems

4.4.1 Fedwire Securities Service

4.4.1.1 Institutional framework

The Fedwire Securities Service (Fedwire Securities), owned and operated by the Federal Reserve Banks, is a real-time delivery versus payment (DVP) securities settlement system that allows for the immediate, final and simultaneous transfer of eligible securities against funds in central bank money. Fedwire Securities provides a system for maintaining and transferring book-entry securities issued by the US Treasury, government agencies, GSEs and certain international organisations.⁴¹ The transfer of securities and associated payment occurs simultaneously and is final when the respective securities and funds accounts are credited and debited. Under the Federal Reserve Act, the Federal Reserve Board is responsible for general supervision and oversight of the Reserve Banks' provision of the Fedwire Securities Service.

4.4.1.2 Participation

Fedwire Securities participants include depository institutions and certain other institutions, including US branches and agencies of foreign banks. Fedwire Securities currently has approximately 2,500 participants.

4.4.1.3 Types of transactions

Fedwire Securities provides issuance, transfer and settlement services for all marketable Treasury securities as well as securities issued by government agencies, GSEs and certain international organisations. The Federal Reserve Banks, in their capacity as fiscal agents for the US Treasury, US federal agencies and GSEs, facilitate the issuance of book-entry securities to participants in the Fedwire Securities Service. Participants may maintain multiple securities accounts and can use the Fedwire Securities Service to transfer securities to settle secondary market trades – including open market operations – to move collateral used to secure obligations and to facilitate repurchase agreement (repo) transactions.

Fedwire Securities processed an average of nearly 78,000 securities transfers per day in 2010. The total value of securities transfers originated during 2010 was approximately USD 320 trillion. At the end of 2010, almost USD 57 trillion in Fedwire-eligible securities were held in custody.

4.4.1.4 Operation of the system

The Fedwire Securities Service is a DVP1 settlement system.⁴² Fedwire Securities processes securities transfers on a gross basis in real time.⁴³ During a typical DVP transaction, the sending participant (sender) initiates the securities transfer by sending a transfer message to the Fedwire Securities Service requesting a transfer of securities to a receiving participant (receiver). Once verified, the securities are automatically withdrawn from the sender's securities account and deposited to the receiver's securities account. Simultaneously, the corresponding funds are withdrawn from the receiver's funds account and deposited to the

⁴¹ In their capacity as fiscal agents, the Federal Reserve Banks act as the central securities depository for securities issued through the Fedwire Securities Service by the US Treasury, government agencies, GSEs and certain international organisations.

⁴² Although most securities transfers are made against a designated payment, securities transfers can be made free of payment.

⁴³ Participants can access the Fedwire Securities Service through computer-to-computer service and browser-based service in the same way that participants can access the Fedwire Funds Service.

sender's funds account. Once the transfer is complete, the Fedwire Securities Service sends both the sender and the receiver notice acknowledging that the message has been processed. The transfers of securities and any related funds over the Fedwire Securities Service are final and irrevocable when a Reserve Bank makes the appropriate debit or credit entries to the respective sending and receiving participants' securities accounts and corresponding funds accounts.

The Fedwire Securities business day begins at 08:30 and ends at 15:15 ET, Monday through Friday, excluding designated holidays. During these hours, participants can originate online securities transfers. Online participants can initiate reversal transactions until 15:30 ET and move (reposition) their securities among their securities accounts until 16:30 ET for payment and until 19:00 free of payment. Offline participants can initiate securities transfers or other requests from 09:00 to 13:30 ET for same-day processing and until 16:00 ET for future-day processing. Under certain circumstances, the Fedwire Securities Service operating hours may be extended by the Federal Reserve Banks.

4.4.1.5 Risk management

Subject to certain conditions, the Federal Reserve Banks extend intraday credit to Fedwire Securities participants lacking sufficient balances to cover Fedwire Securities purchases. The PSR policy describes tools such as debit caps, monitoring, collateralisation and daylight overdraft pricing, that the Federal Reserve Banks use to limit credit risk when extending intraday credit to Fedwire Securities participants. In 2010, aggregate average daily daylight overdrafts for Fedwire Securities was USD 3.8 billion and aggregate daily peak daylight overdrafts was USD 57.2 billion per day. The Federal Reserve Banks manage operational risk using the tools discussed in Section 3.2.1.5.

4.4.2 The Depository Trust Company (DTC)

4.4.2.1 Institutional framework

The Depository Trust Company is a central securities depository and securities settlement system. DTC is a wholly owned subsidiary of DTCC. DTC is registered as a clearing agency with the SEC and is subject to SEC regulation and supervision. DTC is also chartered as limited-purpose trust company under New York State banking law and is a member of the Federal Reserve System and is thus supervised by the New York State Department of Financial Services and the Federal Reserve. Also, DTC has been designated as systemically important by the FSOC, and under Title VIII of the DFA the SEC is its supervisory agency.

4.4.2.2 Participation

DTC's participants include brokers/dealers, banks, investment companies and similar entities. A number of DTC's participants are also participants in NSCC given DTC's provision of settlement services to securities transactions cleared and risk-managed through NSCC.

4.4.2.3 Types of transactions

DTC provides clearing, settlement and central securities depository services for trades in eligible securities including equities, corporate bonds, municipal bonds and money market instruments (MMI), such as commercial paper. The total value of securities on deposit at DTC amounted to approximately USD 36.5 trillion in 2010.

4.4.2.4 Operation of the system

DTC operates a DVP2 settlement system. Securities settle on a gross basis at DTC intraday and associated funds settle on a net basis through NSS at the end of the day (approximately 16:30 ET). To facilitate the settlement of securities transactions intraday, DTC allows receiving participants to incur a net money debit during the day up to a net debit cap

established by DTC. In addition to its net debit caps (which DTC applies to individual participants and to affiliated families of participants), all net debits are fully collateralised (with haircuts) and DTC's risk management builds in an added layer of protection against an MMI issuer failure on the same day as a participant default.

4.4.2.5 Risk management

Risk management controls play a major role in the design of DTC's settlement system.

DTC's risk management controls are based on guidelines established by the Federal Reserve for book-entry securities systems that settle over Fedwire Funds. DTC currently employs three primary risk management controls for securities processing: (i) collateralisation, (ii) net debit caps and (iii) Largest Provisional Net Credit (LPNC) control (exclusive for MMIs).

Collateralisation is meant to ensure that a participant that fails to pay for its settlement obligation will have collateral in its account sufficient to cover that obligation and available to be liquidated in the event it were insolvent. DTC's collateralisation monitoring procedures prevent the completion of transactions that would cause a participant's net debit to exceed the total available collateral in its account. Similarly, the application of net debit cap controls helps assure that DTC has sufficient liquidity to cover the failure of any single participant or of a financial family of affiliated DTC participants. DTC's system prevents the completion of transactions that would cause a participant's net debit to rise above a specific amount – its net debit cap. Participants' net debit caps are limited by DTC's established maximum net debit cap, the value of which is always set lower than DTC's total available liquidity.⁴⁴

In addition to collateralisation and participation requirements, DTC maintains a Participants Fund. In addition to being a liquidity resource, the Participants Fund is available to satisfy any uninsured loss incurred by DTC, including a loss resulting from a participant's failure to settle. In the event of such loss, DTC would first charge the loss to that participant's deposit to the Participants Fund (including its voluntary deposit, if any). If the loss exceeds the failing participant's deposit, DTC can charge the excess to its retained earnings or pro rata to the required Participants Fund deposits of all other participants. Should DTC make a charge against a participant's required deposit to the Participants Fund (pro rata or otherwise), the participant must make an additional deposit to the Participants Fund in an amount equal to the charge.

4.4.2.6 Links to other systems

DTC provides book-entry securities settlement services to NSCC's Continuous Net Settlement. DTC also acts as settlement agent to FICC/GSD and FICC/MBSD to make certain funds-only pass through payments on behalf of NYPC.

DTC has entered into a multilateral netting contract and limited cross-guaranty agreement with FICC, NSCC and OCC, under which these clearing agencies have agreed to make payments to each other for any remaining unsatisfied obligations of a common defaulting participant to the extent that these clearing agencies have excess resources belonging to the defaulting participant.

⁴⁴ In addition to requiring participants to have sufficient collateral to support their net debits and ensuring that their net debits do not exceed their net debit caps, an additional procedure, LPNC, has been established to ensure that the occurrence of a combined MMI issuer's default and a participant's failure to settle does not expose DTC to loss and liquidity risks.

**International
arrangements**

Contents

List of abbreviations	515
1. CLS Bank International	517
1.1 Institutional framework	517
1.2 Participation	517
1.3 Types of transactions	517
1.4 Operation of the system and settlement procedures	518
1.5 Risk management	518
1.6 Major ongoing and future projects	519
2. Clearstream International	519
2.1 Introduction	519
2.2 Institutional framework	520
2.3 Participation	520
2.4 Types of transactions	520
Securities settlement	520
Securities lending and borrowing	520
Triparty Collateral Management Service	521
Triparty Repo Service	521
New issues services	521
2.5 Operation of the system	521
Real-time and end-of-day processing	521
Internal settlement	522
Bridge settlement	522
External settlement	522
The Creation platform	522
Transaction processing environment	523
2.6 Risk management	523
Legal risk	523
Settlement risk	525
Credit risk	525
Liquidity risk	526
Market risk	526
Operational risk	526
Liability of CBL	526
2.7 Links to other systems	527
2.8 Pricing	527

3.	Euroclear Bank	527
3.1	Introduction.....	527
3.2	Institutional framework.....	528
	Oversight and prudential supervision	528
3.3	Participation.....	528
3.4	Types of transactions.....	528
	Securities settlement	528
	Securities lending and borrowing	529
	New issues	529
	Triparty collateral management services.....	530
	Asset servicing.....	530
3.5	Operation of the system.....	530
	Settlement model.....	530
	Settlement windows	530
3.6	Risk management.....	531
	Legal risk	531
	Settlement risk.....	532
	Credit risk	532
	Liquidity risk.....	532
	Market risk	533
	Operational risk.....	533
3.7	Links to other systems	533
3.8	Pricing	533
3.9	Major ongoing and future projects.....	534
3.10	The use of the securities infrastructure by the National Bank of Belgium	534
4.	American Express Company.....	534
4.1	Institutional framework.....	534
4.2	Participation.....	535
4.3	Types of services.....	535
4.4	Operation of the system and settlement procedures	535
	4.4.1 Data transmission.....	535
	4.4.2 Authorisation.....	535
	4.4.3 Clearing and settlement procedures	535
4.5	Risk management.....	535
4.6	Major ongoing and future projects.....	536
5.	MasterCard Worldwide	536
5.1	Institutional framework.....	536

5.2	Participation.....	536
5.3	Types of services.....	536
5.4	Operation of the system and settlement procedures.....	537
	5.4.1 Data transmission.....	537
	5.4.2 Authorisation	537
	5.4.3 Clearing and settlement procedures	537
5.5	Risk management.....	538
5.6	Major ongoing and future projects.....	538
6.	Visa	538
	6.1 Institutional framework.....	538
	6.2 Participation.....	539
	6.3 Types of services.....	539
	6.4 Operation of the system and settlement procedures.....	539
	6.4.1 Data transmission.....	539
	6.4.2 Authorisation	539
	6.4.3 Clearing and settlement procedures	540
	6.5 Risk management.....	540
	6.6 Major ongoing and future projects.....	540
7.	SWIFT	541
	7.1 Introduction.....	541
	7.2 Governance.....	541
	7.3 Oversight.....	542
	7.4 SWIFT messaging	542
	7.5 Market infrastructures	543

List of abbreviations

ASL	Automated Securities Lending
CBL	Clearstream Banking SA, Luxembourg
CBF	Clearstream Banking AG, Frankfurt Clearstream
CCBM	Correspondent Central Banking Model
CGN	classical global note
CS	Clearstream Services SA, Luxembourg
CSD	Central Securities Depository
COP	Clearstream Operations Prague sro
ERM	enterprise risk management
GTCs	CBL's General Terms and Conditions
ICSD	International Central Securities Depository
NBB	National Bank of Belgium
NGN	new global note
SSS	securities settlement system

1. CLS Bank International

1.1 Institutional framework

CLS Bank International (CLS Bank) provides a multicurrency settlement service that mitigates the settlement risk arising from foreign exchange transactions. CLS Bank simultaneously settles both payment obligations (“legs”) that arise from a single foreign exchange transaction. Its payment-versus-payment (PVP) settlement model ensures that one payment leg of a foreign exchange transaction is settled if and only if the corresponding payment leg is also settled, eliminating the principal risk that arises when each leg is settled separately. To facilitate its multicurrency operations, CLS Bank maintains an account at each of the central banks whose currencies it settles.

The CLS organisation includes (i) CLS Group Holdings, a holding company incorporated under the laws of Switzerland and supervised by the Federal Reserve Board as a bank holding company in the United States; (ii) CLS UK Intermediate Holdings, a limited company incorporated under the laws of England and Wales that provides corporate services (ie finance, legal, human resources, audit and communications) to CLS Bank and its affiliated companies; (iii) CLS Bank, an Edge Act corporation organised under the laws of the United States, and a financial market utility designated as systemically important by the FSOC and supervised by the Federal Reserve Board; (iv) CLS Services, a limited company incorporated under laws of England and Wales, which provides operational and back-office support to CLS Bank and its affiliated companies; (v) CLS Aggregation, a limited liability company organised under the laws of the State of Delaware which provides an aggregation service that compresses multiple foreign exchange transactions into a single foreign exchange transaction.

1.2 Participation

Participants must meet certain financial and operating requirements in order to become a CLS Bank settlement member. Each settlement member maintains a single multicurrency account at CLS Bank. Settlement members can submit instructions on their own behalf as well as on behalf of their customers, which may include banks, non-bank financial institutions or multinational corporations. Customers can settle indirectly in CLS Bank as a third party of a settlement member that agrees to be responsible for those payment instructions in CLS Bank. All funding takes place between CLS Bank and the settlement member that is providing the third-party service. As of end-September 2011, CLS Bank had 61 settlement members and more than 13,000 third-party participants.

1.3 Types of transactions

CLS Bank currently provides settlement of foreign exchange transactions in 17 currencies¹ for six main financial instruments: FX spot, FX forwards, FX swaps, FX option exercises, non-deliverable forwards (NDFs) and credit derivatives.² In 2011, CLS Bank settled an average daily value equivalent to USD 4.8 trillion.

¹ CLS Bank provides settlement for the US dollar (USD), euro (EUR), pound sterling (GBP), Japanese yen (JPY), Swiss franc (CHF), Canadian dollar (CAD), Australian dollar (AUD), Swedish krona (SEK), Danish krone (DKK), Norwegian krone (NOK), Singapore dollar (SGD), Hong Kong dollar (HKD), New Zealand dollar (NZD), Korean won (KRW), South African rand (ZAR), Israeli shekel (ILS), and Mexican peso (MXN).

² Credit derivatives transactions are settled in nine currencies.

1.4 Operation of the system and settlement procedures

Upon receipt of any payment instruction, the CLS system authenticates and validates certain information included in the instruction.³ During settlement processing, CLS Bank attempts to settle each payment instruction, subject to certain risk management tests (see Section 1.5), by making the appropriate debit and credit across the accounts of the relevant settlement members. These debits and credits are final upon execution of the transfers on the books of CLS Bank. As instructions are settled over the course of the day, settlement members accumulate net debit balances in currencies where they and their customers are net sellers and net credit balances in those where they and their customers are net purchasers.

Each settlement member funds its multicurrency account at CLS Bank each business day. CLS Bank receives payments from and makes payments to its settlement members in each respective currency using the real-time gross settlement (RTGS) systems of each central bank whose currencies it settles. All transfers of funds occur during a three-hour period for Asia-Pacific currencies (07:00–10:00 CET), and a five-hour period for all other currencies (07:00–12:00 CET).

CLS Bank makes payouts to members during the settlement day in currencies in which they have a net credit position, subject to the constraint that the sum of all currency balances (positive and negative) in a member's account, calculated as a US dollar equivalent, is not negative. Payouts are made according to an algorithm that, among other things, accords priority to members and currencies with the highest balances. In normal circumstances, settlement members will have zero balances in their CLS Bank accounts at the end of each day, and CLS Bank will have zero balances in its central bank accounts at the end of each day.

1.5 Risk management

CLS Bank is subject to the Federal Reserve Board's Policy Statement on Payments System Risk, which incorporates the international standards set out in the CPSS *Core Principles for Systemically Important Payment Systems*. CLS Bank's risk management tools include membership requirements, account position limits, currency haircuts on positions, committed liquidity facilities and loss-sharing arrangements. In particular, CLS Bank imposes aggregate short position limits that are member-specific and determined by an assessment of a member's credit, liquidity and operational capabilities. CLS Bank also imposes currency-specific short position limits at levels that are directly related to CLS Bank's committed liquidity facilities in that currency. Finally, CLS Bank requires members to have a positive account balance across all currencies adjusted for haircuts.

CLS Bank does not guarantee that all instructions submitted will be accepted for settlement. As the CLS settlement algorithm processes the queue of payment instructions accepted for settlement, only instructions that pass all of CLS Bank's risk controls can be settled through CLS. Instructions remaining in the queue at the end of the settlement period are returned to the sender.

The design of the CLS system ensures access to sufficient liquidity from contracted liquidity providers in the event that any single member fails to pay required amounts, even if the failing member also serves as one of the liquidity providers. CLS Bank could incur losses in the unlikely event that a member fails to make a required payment to CLS Bank and exchange rate movements exceed the haircuts CLS Bank has built into the system to guard

³ If the payment instruction is not successfully authenticated and validated, it will be rejected by the CLS system.

against risk from extreme exchange rate movements. In such cases, CLS Bank would employ a loss-sharing arrangement.

1.6 Major ongoing and future projects

CLS Bank is continuing its efforts to extend coverage of its settlement service to further reduce settlement risk in the FX market. CLS Bank is actively engaged in extending its settlement service to additional currencies with the launch of new currency programme in 2011. In addition, CLS Bank is collaborating with its settlement members to extend its settlement service to additional participants and to offer settlement of same-day FX trading activity.

2. Clearstream International

2.1 Introduction

Clearstream International SA⁴ is an international clearing and settlement corporation for equities and bonds for both domestic and international business. Offering a wide range of services, the company is owned 100% by the Deutsche Börse AG via Clearstream Holding AG, both incorporated in Germany. Clearstream International SA is incorporated in Luxembourg and has four main subsidiaries: Clearstream Banking SA, Luxembourg (CBL), Clearstream Banking AG, Frankfurt (CBF), Clearstream Services SA Luxembourg (CS) and Clearstream Operations Prague sro (COP) established in 2008.

Clearstream International provides two fundamental types of service to the industry: (i) an international central securities depository (ICSD) through CBL and (ii) a central securities depository (CSD) through CBF.

CBL also has a subsidiary in Japan (Clearstream Banking Japan Ltd, opened in 2009), a branch in Singapore and representative offices in major financial centres such as Dubai, Hong Kong, London, New York and Tokyo.

CBL also operates LuxClear, a service that offers all the securities services required in collateralisation with the Central Bank of Luxembourg, both for Luxembourg-domiciled banks and for foreign banks according to the CCBM (Correspondent Central Banking Model).

With the Central Bank of Luxembourg, Clearstream International has also jointly established a new Luxembourg-based CSD, LuxCSD, which provides settlement in central bank money and will provide local access to T2S when it is implemented in 2015. LuxCSD is co-owned in equal shares by the two founding partners.

CBF offers clearing and settlement facilities as a CSD for the German securities markets and for international securities via direct links to CBL and other CSDs. CBF maintains relationships with more than 400 German banks as well as with remote international

⁴ Cedel was founded on 28 September 1970 in order to provide for the clearing, settlement, custody and management of securities and precious metals. On 1 January 1995, Cedel became Cedel Bank (later Cedelbank). At the same time, Cedel International was established as the parent company of the Cedel Group. In May 1999, Cedel International (the Luxembourg-based ISCD) and Deutsche Börse Clearing AG (German CSD) merged and formed Clearstream International (effective as of January 2000). Deutsche Börse initially held a 50% stake in Clearstream International, but acquired the remaining 50% stake in July 2002, when Clearstream International became a wholly owned subsidiary of Deutsche Börse Group. In July 2009, Deutsche Börse AG transferred 51% of Clearstream International's shares to Clearstream Holding AG, which in turn became the holding company of the Clearstream Group.

participants, serving more than 50 markets via indirect usage of the CBL links network. See the country chapter for Germany for more information on CBF.

CS provides a single IT platform known as Creation for the clearing, settlement and custody of international transactions through both CBL and CBF in commercial bank money. This secure and capable settlement platform operates in real time for 21 hours a day. CBF continues to operate the settlement system for the German market in central bank money on a separate platform (CASCADE).

COP is an additional operation centre, which services group activities.

For the structure of the Clearstream Group, see Section 4.4.3 in the descriptive Red Book chapter on the euro area.

2.2 Institutional framework

CBL is a licensed credit institution incorporated under Luxembourg law and is thus authorised to carry out a complete range of banking activities. However, CBL's by-laws stipulate that its core business consists of acting as a depository and providing clearing and settlement services in respect of securities deposited with CBL. Consequently, CBL's other banking activities are limited to facilitating its settlement and clearing services.

As a licensed credit institution, CBL is subject to supervision by the Commission de Supervision du Secteur Financier (CSSF).

Following the transposition of the EC Settlement Finality Directive into Luxembourg law, the European Commission has been notified of the SSS status of CBL, which is thus covered by this directive. As such, CBL is overseen by the Central Bank of Luxembourg.

2.3 Participation

Participation is open to banks, broker-dealers, investment banks, central banks, CSDs etc. New participants have to meet certain criteria when applying for participation. The credit standing of participants is continuously monitored. The participation criteria include the institution's net worth, its legal structure, its management reputation and the underlying country risk. Today, the Clearstream Group including CBL and CBF maintains relationships with around 2,500 customers in more than 110 countries.

2.4 Types of transactions

Securities settlement

CBL as an ICSD offers clearing, settlement and asset servicing facilities for the Eurobond market and for securities issued in more than 50 countries. More than 400,000 domestic and internationally traded bonds, equities and investment funds are currently deposited with Clearstream. CBL also offers investment funds solutions such as CFF (Central Facility Funds issuance and redemption of investment fund units through the books of CBL) and Vestima (investment fund order routing). Finally, CBL provides securities lending, collateral and cash management services to its customers.

Securities lending and borrowing

CBL offers two distinct but complementary securities lending and borrowing services: ASL (Automated Securities Lending), which is an automated process designed to prevent failed settlements, maximise settlement efficiency and improve settlement reliability; and ASLplus, which provides access to credit via the wholesale securities lending market. In ASL,

CBL acts as an agent in arranging loans of securities to customers in order to maximise the number of transactions settled and to provide revenue to lenders. In ASLplus, CBL acts as the single principal borrower to all the lenders, negotiating rates with selected borrowers on a loan by loan basis with the aim of increasing revenues by matching market demand with the supply afforded by the lender securities portfolios held at Clearstream.

Triparty Collateral Management Service

CBL also provides a Triparty Collateral Management Service to its customers. This service frees customers from collateral management and administrative tasks from the moment a transaction takes place through to final settlement. CBL monitors the credit exposure and collateral coverage throughout the duration of a deal. CBL marks positions to market daily, makes margin calls and provides comprehensive daily transaction and settlement reports.

Triparty Repo Service

CBL's Triparty Repo Service simplifies the process of administering multicurrency repurchase agreements for both the giver and receiver of collateral, and mitigates the operational risks associated with some types of repurchase agreements by offering a comprehensive delivery-versus-payment and securities safekeeping service. Collateral received under a triparty repo agreement is monitored, reviewed and marked to market daily to ensure that collateral margin requirements are maintained.

New issues services

Custody, together with clearing and settlement, constitutes CBL's core business. Before securities become available for secondary market settlement and for CBL's custody management services, CBL can also handle both the closing operations and the distribution of allotments in new issues. A comprehensive range of services is provided for the eligibility assessment, issuance and distribution of new issues in both international and domestic markets. CBL can offer these services in respect of domestic, European and international securities (including certificates of deposit, depository receipts, treasury bills, commercial paper, short- and medium-term notes, bonds, equities, warrants, equity-linked notes and investment funds).

CBL assists lead managers, lawyers and issuing agents in launching new issues. It reviews issue structures and can provide guidance on operational procedures for specific new issue features or requirements. CBL also advises on the documentation of these procedures in the offering memorandum, prospectus and agency agreement.

2.5 Operation of the system

CBL's book-entry IT system for the simultaneous exchange of cash and securities is a DVP mechanism designed to eliminate principal risk. Where customers cannot deliver securities or cash at the designated time, CBL offers a comprehensive securities lending programme and also provides cash lending facilities. These support mechanisms are closely monitored via dedicated cash and collateral management systems.

The CBL "settlement day" consists of one main settlement processing, the real-time processing, followed by the end-of-day processing, as described in detail below.

Real-time and end-of-day processing

Transactions in CBL are processed during the real-time processing, which is followed by the end-of-day processing.

The real-time processing starts at 21:00 on the evening of the business day preceding the settlement date (SD) and runs continuously until 14:55 on SD, followed by the end-of-day processing, which is completed by 19:00 on SD.

CBL differentiates between mandatory and optional settlement periods. This distinction is particularly relevant for the acceptance of transfer orders relating to external settlement in Euroclear and other CSDs.

- The mandatory settlement period begins at 21:00 on SD–1 and runs continuously until 14:55 on SD.
- The optional settlement period follows the mandatory settlement period and is completed by 19:00 on SD.

Internal settlement

Securities held in the CBL system and traded between CBL counterparties are settled in accordance with the counterparties' instructions on a DVP or FOP basis through the simultaneous book-entry transfer of securities and cash between the accounts of the buyer and the seller.

Bridge settlement

The first Bridge Agreement between CBL and Euroclear was concluded in 1993. Trades with counterparties in Euroclear were settled overnight via the electronic Bridge on a DVP or FOP basis. The Bridge allowed transactions to be settled between customers of CBL and Euroclear by crediting or debiting the accounts that the clearing and settlement systems hold with each other.

On 29 November 2000, Clearstream International and Euroclear signed an agreement to supplement the existing overnight Bridge with a new daytime transaction processing feature. A manual version of this daytime Bridge for multiple intraday exchanges of securities and cash deliveries started operations in 2001. The main benefits of this enhancement were increased efficiency, greater liquidity for customer transactions and the ability to distribute new issues on a same-day basis.

In 2004 and 2008, Clearstream and Euroclear introduced further significant enhancements by implementing the automated Daytime Bridge and extending its operation times. The new Bridge improves cross-border settlement efficiency, in particular by extending instruction deadlines and allowing same-day (T+0) Bridge transactions, thereby increasing interoperability between the two ICSDs.

- Concerning the mandatory settlement period, customers can submit instructions for Bridge settlement until 13:00 SD and internal instructions until 14:45 SD.
- Concerning the optional settlement period, the deadlines for submission of customers' instructions are 15:00 SD for Bridge instructions against payment, 16:00 SD for Bridge instructions free of payment and 18:00 SD for internal instructions.

External settlement

Trades with counterparties on other domestic markets are settled through one of CBL's depositories (either a national CSD or a custodian bank, depending on the market).

The Creation platform

The Creation settlement system is a central application that allows CBL to offer customers a rapid daytime settlement service. In addition to features such as eligibility checking, provision

checking, technical netting, settlement and transaction booking, the Creation system includes functions such as automatic reimbursement of securities lending, automatic substitution of collateral, automatic collateral top-up and return of specific collateral pledged, and settlement of securities financing transactions.

By virtue of its continuous intraday DVP settlement process, the Creation IT platform improves liquidity for customers by providing for technical netting facilities.

Transaction processing environment

CBL accepts settlement instructions through CreationConnect, its proprietary communications system, by authenticated SWIFT and through CPU-CPU links. CreationConnect products provide real-time access to enhanced information provision, instruction input, position and transaction reporting and offer a choice of web browser (CreationOnline), file transfer (CreationDirect) and SWIFT access (Creation via SWIFT). Most instructions are processed without human intervention. Certain transactions may be processed or entered into the system by CBL staff, based on customer instructions.

Once an instruction is received by CBL, it is checked automatically against validation criteria such as the International Securities Identification Number (ISIN) to ensure that the instruction has been input correctly. Once validated, the instruction must be matched with the instruction from the counterparty. It will then be deemed a valid settlement order. If the instruction is not validated, the customer is informed immediately so that the instruction can be rectified and a new instruction sent in advance of the processing deadline.

Reports of settled and unsettled trades are available at regular intervals intraday (some reports are available on a continuous basis) throughout the real-time processing. Full reporting, including information on cash and securities balances and total holdings, is provided to customers during the end-of-day processing

2.6 Risk management

To ensure that risks can be identified and dealt with at an early stage, Clearstream International has a group-wide risk management concept for processes, roles and responsibilities that is applicable to all staff and organisational entities of Deutsche Börse Group.

The Clearstream risk management framework, as stated in the Group Risk Management Policy, aims to ensure that all threats as well as causes of loss and potential disruption are properly and promptly identified, centrally recorded and assessed (as far as possible in terms of potential financial loss), so that appropriate action is taken and a consolidated report promptly submitted to the Executive Boards.

Clearstream International provides annual public disclosure in line with Pillar 3 of Basel II.

Legal risk

CBL is subject to the Law of 5 April 1993 on the financial sector, as recently amended. The law sets forth the authorisation process for and obligations of banks, operators of securities settlement systems and other financial sector institutions established in Luxembourg, and the relevant prudential supervision regime. Under the provisions of this legislation, CBL is designated as a securities settlement system under Luxembourg law.

As such, CBL is also subject to the Law of 10 November 2009 on payment services, the business of electronic money and settlement finality in payment and securities settlement systems, as recently amended by the Law of 20 May 2011 transposing inter alia the EC Directive 2009/44/EC. This law sets out the requirements for SSS.

The transfer of securities is mainly governed by the Law of 1 August 2001 on the circulation of securities and other fungible instruments (the “Securities Law”), as modified. The provisions of the Securities Law apply to all securities and other financial instruments, whether in physical form or dematerialised, bearer or registered, domestic or foreign, or other form under applicable legislation. Securities and other financial instruments are fungible or are deemed to be so when they are interchangeable during the settlement process. Fungible securities are booked in accounts and may be transferred from one account to another by book entry.

Agreements on financial collateral are governed by the Law of 5 August 2005 on financial collateral arrangements (the “2005 Law”), as recently amended by the Law of 20 May 2011, which together provide a legal framework for the implementation and enforcement of pledges, repos, nettings, and transfer of title operations.

CBL’s general terms and conditions (GTCs) specify Luxembourg law as applicable to all services provided by CBL including settlement. As regards ownership, the depositor has co-ownership rights in the securities – a right in rem of an intangible nature (Article 6 of the Securities Law). However, this right in rem can only be enforced by the participant against CBL. The rights in case of a pledge or other collateral arrangements are governed by the 2005 Law.

Luxembourg law provides that CBL is under no obligation to keep the securities deposited with it at the place where the deposit is made and is entitled to sub-deposit the securities with other depositories in Luxembourg or abroad (Article 12 of the Securities Law). Customers’ securities are segregated from its own securities. Such sub-deposit alters neither the location of securities, which remains at the registered office of CBL, nor the validity and enforceability of a pledge created over such securities (Article 23 of the 2005 Law). Formal legal opinions under the national law where assets are sub-deposited confirm that the securities would not be part of the general assets of the other depositories and that those assets should not be subject to attachment by their creditors. These opinions represent a confirmation of key legal requirements including enforceability of depository’s obligations, enforceability of a judgement of a Luxembourg court, recoverability of assets in case of default by the depository and the legal status and authority of the depository.

If an event occurs that CBL reasonably believes would materially affect the customer’s ability to fulfil its obligations towards CBL or any agreement between CBL and the customer, CBL may terminate or suspend the provision of the services to this customer with immediate effect and without prior notice.

In accordance with its GTCs, CBL accepts liability towards its participants for negligence or wilful misconduct. It is only liable for gross negligence or wilful misconduct concerning indirect or unforeseeable damages. If such an event occurs, CBL is entitled to undertake measures to mitigate damages and protect the interests of CBL and its customers. However, CBL will only be liable for its own acts and omissions. CBL’s liability is excluded for events beyond its control. Nevertheless, CBL will undertake all relevant actions, including steps against another Clearstream subsidiary, in the event of its insolvency or if it has committed harmful acts or omissions. The costs of any such actions will be for the account of the relevant participant.

In addition to this liability regime, CBL is covered by insurance policies. They include a comprehensive crime and depository insurance for customer claims and an insurance for all risks of physical loss or damage, for losses or damage of instruments held by CBL on behalf of its customers or in transit in CBL’s system. In addition, coverage is held against fraud, negligence, or omissions of employees that result in a direct loss sustained by a customer for which CBL is held to be legally liable. However, the insurance does not cover failures of mandatory infrastructure services or goods providers, such as telecommunications services, electricity and power supply services, or SWIFT services.

Settlement risk

CBL operates a DVP Model 1 system ensuring simultaneous settlement of securities and funds transfers on a gross (trade-by-trade) basis. CBL settles transactions between customers by simultaneous book-entry debits and credits in their respective securities and/or cash accounts. These book entries are passed after completion of a processing run that takes account of customers' instructions transaction by transaction, in an iterative process, to determine which of the transactions can settle in such a way as to optimise settlement while remaining within predefined limits.

External transactions settling through domestic market links established by CBL settle in accordance with domestic market finality rules. As a rule, CBL only credits the account of a participant with securities after the receipt of the securities in CBL's domestic account after finality.

Credit risk

CBL provides banking and custody services to its participants in multicurrency securities settlement activities. CBL has an external AA rating.

CBL only extends credit to customers who meet its stringent requirements. Limits are applied to all credit facilities extended to customers, and are always individually negotiated.

CBL determines which securities are eligible as collateral and which haircuts apply to them. To facilitate the collateral management process, the same securities are eligible and the same haircuts are applicable to CBL's settlement credit facility and ASL, although the party to whom the collateral is pledged differs. Haircuts may range from 1% to 100%. In general, securities eligible as collateral are investment-grade issues, with the exception of some sub-investment grade sovereign debt. Collateral is marked to market daily. Decisions on changes in eligible collateral, applicable haircuts and valuation methodologies for the purposes of securing credit granted by CBL and for securities lending and borrowing programmes are developed and reviewed by the Credit Department. Changes in eligible collateral or haircuts in the Triparty Collateral Management services suite can be made at any time with the mutual agreement of the counterparties to the transaction.

Collateral policies are set out in CBL's Customer Handbook and in its customer communications whenever there is a change. Collateral policies concerning ASL and ASLplus are covered in the legal agreements for these services. Collateral policies concerning the triparty services are an integral part of the Collateral Management Service Agreement (CMSA) signed by the receiver and the giver of collateral.

For customers to which it has an approved credit exposure, CBL sets a secured intraday credit limit in the form of an Unconfirmed Funds Facility (UCF) that allows the customer to use the funds that CBL expects to receive on that account for settlement purposes, provided that the customer has sufficient collateral on its account. CBL may also grant a Technical Overdraft Facility (TOF), another intraday limit that may be used for settlement purposes only.

Under CBL's GTCs, all proprietary assets held by the customer in CBL are pledged in favour of CBL to the extent of any credit facilities granted to the customer. The customer is required to notify CBL if it holds on account with CBL any assets that the customer is not entitled to use as collateral against its own liabilities vis-à-vis CBL. Securities and other holdings that are pledged against a credit facility provided for securities borrowing are excluded from the calculation of collateral to cover any other credit arrangements. Collateral values are calculated on the basis of recent market prices less the deduction of haircuts in line with international banking standards. Collateral must be investment grade (BBB- and above).

Liquidity risk

Liquidity risk is managed by matching the duration of investments and liabilities, restricting investments in potentially illiquid or volatile asset classes, authorising CBL to repledge securities received with central banks and maintaining sufficient financing facilities to overcome unexpected demands for liquidity.

CBL's current liabilities, including customer demand deposits, are adequately covered by loans to banks and customers, which may be invested up to a maximum of six months, and by other debt instruments and fixed income securities. The fixed income securities can be pledged to central banks should the need for additional short-term liquidity arise.

CBL is required to maintain a cash balance at the Central Bank of Luxembourg based on liabilities other than amounts due to credit institutions, subject to minimum reserve requirements. As the investment policy of the Clearstream Group only allows investment in fixed income securities with a credit rating of AA– or higher, it is expected that all such securities could be liquidated within a short time period without significant loss.

Market risk

According to its GTCs, CBL has a general right of retention and setoff on all assets held on the customer's account that secure obligations towards CBL by the customer for the services rendered by CBL. All assets held by the customer in CBL are pledged in favour of CBL to the extent of any credit facilities granted to the customer. The customer is required to notify CBL if it holds on account with CBL any assets that the customer is not entitled to use as collateral against its own liabilities vis-à-vis CBL. This may apply, for example, to securities held on behalf of the customer's own clients.

The collateral value of all securities and other holdings on the customer's account must at all times be equal to, or greater than, the total value of all obligations that CBL undertakes on behalf of the customer. In general, securities are monitored against credit limit usage. CBL automatically monitors the limits on its secured credit lines. All securities are reviewed for collateral eligibility in terms of issues, liquidity and market risk. Positions pledged as collateral are reviewed in accordance with fluctuations in market values. Pledged collateral is also monitored to identify whether the securities pledged are required to execute forthcoming deliveries. If this is the case, alternative collateral is sought in order to release the pledged securities for settlement. Valuation can be done at any time with the mutual agreement of the transaction counterparties.

Operational risk

CBL's business continuity management policy provides for a central team, organisationally independent from the operations and IT departments, which is responsible for coordinating the business continuity plan and for providing a planning framework for all other units and departments. Business functions and systems are classified by varying degrees of criticality in accordance with the risk management framework. This analysis identifies the point in time when non-delivery of all or part of a service will have a non-tolerable impact on the business. It also designates the services, staff, systems, facilities and other requirements that are mission-critical and that must be included in the business continuity plan. These are tested annually.

Liability of CBL

Except in the case of negligence or wilful misconduct, CBL is not liable to customers for any loss, claim, liability, expense or damage arising from any action taken or not taken by CBL. In addition, CBL's activities are covered by comprehensive insurance policies. These include a comprehensive crime and depository indemnity of up to EUR 20 million, with a deductible of

EUR 5 million; and, an insurance policy covering all risks of physical loss or damage. Coverage is up to EUR 75 million for each and every loss per transport or on premises with an excess of EUR 50 million. The level of deductible depends on the risk category. Additionally, CBL has a EUR 300 million line of cover for directors and officers.

2.7 Links to other systems

CBL has a long history of establishing links with other countries to facilitate the custody of foreign securities. It currently offers its customers access to more than 50 markets around the world via a network of local sub-custodians and CSDs, including via the Bridge with Euroclear Bank.

Worldwide access to different markets is provided via (i) direct links, in which CBL has an account in its own name with the CSD; (ii) operated links, where CBL also has an account in its own name with a CSD but which is technically operated by a third party; and (iii) indirect links, via an account with a sub-custodian which has an account in its own name with the CSD.

CBL's cross-border settlement network allows its customers to trade and settle multimarket securities in the home market (generally the issuer's market), in a remote market (a domestic market other than the issuer's) and in cross-border transactions between the home market and a remote market.

2.8 Pricing

On its website, CBL publicly discloses its fee schedule, including fees for safekeeping services, settlement and cash services, custody administration services, information provision services, investment funds services and the fees for the different securities lending programmes. CBL informs its customers about changes to the fee schedule via customer communications. CBL applies a unified price structure for combined internal and Bridge settlement volumes. This set of fees is calculated on one sliding scale combining both debt and equity instruments across all markets offered by Clearstream.

The safekeeping fee calculation is based on the average daily value of securities per month, which is derived from the nominal value of debt securities and on the market value for all other securities. In addition, a family grouping discount mechanism (family groups and account grouping) and the core market concept applies. The core market concept groups together the markets in which CBL's customers are most active. Special sliding scales depending on the group and account deposit are also applied.

The custody administration services fee is charged on mandatory corporate events based on the number of executed events (compensations, cash payments, redemptions, stock dividends etc) and for voluntary events, for which customer instructions are required, according to the number of customer instructions. Securities lending and borrowing fees are calculated once a day after the end-of-day processing has been completed. Fees are charged and income is paid pro rata temporis based on a 360-day year and on the market value of the securities (plus accrued interest where applicable).

3. Euroclear Bank

3.1 Introduction

Euroclear Bank provides both international central securities depository (ICSD) and securities settlement services, including custody, new issues distribution, securities lending and money transfer. It is one of the entities of the Euroclear group that also comprises the

CSDs of the United Kingdom (Euroclear UK & Ireland), France (Euroclear France), the Netherlands (Euroclear Nederland), Sweden (Euroclear Sweden), Finland (Euroclear Finland) and the Belgian CSD for private debt and equities (Euroclear Belgium). For the structure of the Euroclear group, see Section 4.4.1 in the descriptive Red Book chapter on the euro area.

3.2 Institutional framework

Euroclear Bank, a credit institution incorporated under Belgian law, operates the Euroclear system.

Oversight and prudential supervision

Euroclear Bank is subject to oversight by the National Bank of Belgium (NBB) according to Article 8 of the NBB Organic Law of February 1998 and Article 23 of the law of 2 August 2002. As a credit institution incorporated in Belgium, Euroclear Bank is also subject to prudential supervision in accordance with the law on the legal statute and supervision of credit institutions (22 March 1993) and the law on the supervision of the financial sector and financial services (2 August 2002).

With effect from 1 April 2011, the NBB is in charge of prudential supervision of Euroclear Bank while a new entity, the Financial Services and Markets Authority (FSMA),⁵ is responsible for financial market supervision and consumer protection.

3.3 Participation

Euroclear Bank has about 1,300 participants from more than 80 countries. The vast majority of participants are broker-dealers, custodians, investment managers and central banks. Applicants must meet five criteria as set out in system's admission policy:

- adequate financial resources;
- technological capability to use the Euroclear system;
- need for and potential use of the Euroclear system;
- sound reputation in the market; and
- an adequate anti-money laundering programme.

In order to evaluate potential risks, the assessment of applicants according to these criteria takes into account their specific characteristics, such as the business they are engaged in.

3.4 Types of transactions

Securities settlement

About 200,000 national and international securities are accepted in Euroclear Bank, including debt securities, depository receipts, equities, warrants and investment funds. Participants in Euroclear Bank can settle against payment securities transactions by book entry.⁶

⁵ The FSMA is the successor to the Banking Finance and Insurance Commission (CBFA).

⁶ Euroclear Bank also processes investment funds on a dedicated platform called FundSettle.

Transactions in Euroclear Bank are settled on a DVP1 basis in commercial bank money in more than 50 settlement currencies. Euroclear Bank has only direct participants (no tiering). Many of them do not have access to central bank money. As a consequence, Euroclear Bank does not rely on central bank accounts/facilities in all settlement currencies but makes use of a network of cash correspondents to provide its multicurrency settlement services. The cash correspondents are the link between Euroclear Bank and the national payment system in the country of the relevant currency.

For the four main currencies (EUR, USD, GBP and JPY), Euroclear Bank relies on several cash correspondents.

Securities lending and borrowing

Euroclear Bank offers a securities lending and borrowing programme that is fully integrated into its settlement process. It comprises several real-time lending and borrowing processing windows. The last opportunity to borrow is at 14:00 and the last opportunity to reimburse is at 17:00 or 17:30 depending on the market.

All securities made available by lenders are aggregated in an anonymous lending pool. Borrowings are allocated whenever a borrower's account lacks securities to execute a delivery instruction, provided that a sufficient lendable supply of the relevant issue is available. Euroclear Bank guarantees to each lender the return of lent securities. Through the intermediation of Euroclear Bank (a borrower has a contractual relationship with Euroclear Bank only), confidentiality is ensured.

New issues

Euroclear Bank acts as primary place of deposit for eurobonds and other international securities. These types of security are always issued on a physical basis either in the form of a global physical certificate (global note) representing the whole issue or in the form of individual notes (marginal share of the issues) that are immobilised with their depositary.

Different custody structures can be chosen by the issuer (or its agent) for these securities in either bearer or registered form. Depending on the structure chosen (ie new or classical global notes), issued securities are eligible as collateral for Eurosystem monetary policy and intraday credit operations. In order to be ESCB-eligible,⁷ all newly issued global bearer form securities with the ICSDs as primary place of deposit should be issued in new global note (NGN) form, and deposited with either Euroclear Bank or Clearstream Banking Luxembourg as ICSD common safekeeper. In accordance with Eurosystem rules, the NGN is serviced by a common service provider (in charge of providing asset services to the ICSDs) and a common safekeeper (in charge of safekeeping the NGN throughout its life). Similarly, new global form registered securities issued after 1 October 2010 have to be safekept by and registered in the name of a nominee of the ICSD as common safekeeper and serviced by a common service provider in order to be ESCB-eligible. Newly issued securities with a classical global note (CGN) structure, represented by a bearer or registered form global note that is deposited with a common depositary on behalf of the two ICSDs that provide safekeeping and asset servicing for such securities, are no longer ESCB-eligible (whereas older CGN issues remain ESCB-eligible until their maturity).

⁷ As of 1 January 2007.

Triparty collateral management services

Euroclear Bank participants can collateralise all types of exposures across instruments and counterparties using one collateral pool. These services include repos, securities lending, derivatives (collateralising credit exposures arising from over-the-counter derivatives transactions) and secured loans (collateralising credit exposures arising from various credit agreements). For each collateral management product, a specific triparty agreement must be concluded between the collateral giver, the collateral taker and Euroclear Bank. The latter acts as the neutral triparty agent service provider on behalf of both the collateral giver and the collateral taker. AutoSelect, the automated collateral allocation and monitoring tool, enables the selection and substitution of collateral securities. It also ensures that the transaction remains fully collateralised at all times. Collateral valuation is done on at least a daily basis, automatically generating and reporting margin calls.

Asset servicing

Euroclear Bank offers a large number of custody services facilitating the exercise of securities holders' rights and corporate actions, including tax services, proxy voting, information on corporate events and processing for collection of income and redemption proceeds, market claims and subscription rights.

3.5 Operation of the system

Settlement model

On the settlement date, securities are transferred by book entry from the securities account of the seller to that of the buyer, provided that settlement conditions are met. Simultaneously, cash is transferred from the account of the buyer to that of the seller. Securities and cash transfers between buyer and seller accounts are final and irrevocable upon generation of the settlement records in the books of Euroclear Bank.⁸

Settlement windows

The securities settlement process includes batch and real-time processes.

The overnight batch process comprises two batches⁹ that run during the night. The batch process starts the positioning of matched transactions that have reached their settlement date. This process settles the main volume and value of transactions.

The real-time process is used to recycle the pending/unsettled transactions from the overnight batch process but also for settlement instructions received for same day settlement which are introduced, validated and matched during that working day. All instructions for real-time settlement which are not settled at the end of the process are automatically recycled for settlement in the next batch process.

The system's processing window starts at 22:00 on T-1 with the batch process and ends at around 18:30 on day T with the close of the optional real-time process. After 14:30, real-time settlement is not mandatory, meaning that the buyer and the seller must both explicitly authorise settlement in that part of the real-time process otherwise the settlement is postponed until the next night's processing. The rationale behind this optional settlement

⁸ DVP1.

⁹ SET1 (from 22:00 (T-1) until 23:30 (T-1)) and SET2 (from 01:00 (T) until 02:30 (T)).

window is related to potential liquidity management issues that might arise among the system participants as cash deadlines approach.

Whenever possible, external instructions for same day value, including settlement feedback from local markets, are also processed within the Euroclear Bank processing window for same day value. Securities transactions are settled via domestic market links in accordance with local market rules.

Settlement efficiency is further optimised through dynamic recycling of securities and cash positions throughout the securities settlement processing. After each securities settlement processing, Euroclear Bank provides participants with a report of settled and unsettled securities transactions and, at the beginning of each business day, with a report of positions resulting from the overnight processing.

3.6 Risk management

The Euroclear group manages its risks under an enterprise risk management (ERM) framework with policies related to each of the relevant risks it faces in pursuing its business objectives. The ERM framework is used to ensure the coherence of the group's risk management and internal control activities, for example by defining how risks are identified and mitigated or by supporting risk owners in taking decisions that accord with the company's risk appetite. Euroclear Bank makes an annual public disclosure in line with Pillar 3 of Basel II. See also Section 4.4.1.4 in the descriptive Red Book chapter on the euro area.

Legal risk

The Euroclear system has been designated as a settlement system under the provisions of the law of 28 April 1999 that implements the EU Settlement Finality Directive 98/26/EC. This law protects the validity and enforceability of securities and cash transfers as well as final settlement within the Euroclear system. As from the implementation of the Royal Decree of 3 June 2007, this protection is also granted to the very limited number of non-financial companies participating in the Euroclear system.

All securities accepted in Euroclear Bank are held and transferred by book entry in accordance with Royal Decree no 62 of 10 November 1967, coordinated by the Royal Decree of 27 January 2004. Royal Decree no 62 establishes the participants' co-ownership right in the pool of fungible securities credited to their account whereby a participant has direct co-ownership rights, not over specific securities, but over all securities of the same type held in the system. Each participant has therefore the right to "revindicate" (obtain the return in kind of) the same amount and category of securities that is standing to the credit of its securities account, even in the case of the failure or insolvency of Euroclear Bank. As Euroclear Bank has no ownership interest in securities held in its system, securities never become part of the estate of Euroclear Bank, thus protecting participants under Belgian law against the risk of bankruptcy of Euroclear Bank.

Euroclear Bank is also licensed to hold on behalf of third parties dematerialised securities of Belgian public debt, dematerialised securities issued under Belgian law by Belgian companies and Belgian commercial paper in conformity with the law of 2 January 1991 on public debt instruments, the Belgian Company Code (and the Royal Decree of 12 January 2006 on the dematerialised securities of companies), the law of 22 July 1991 on commercial paper (thesauriebewijzen/certificats de trésorerie and depositocertificaten/certificats de dépôt) and the Ministerial Decree of 24 January 1991 on the licensing of the holding of dematerialised securities of Belgian public debt (Article 1, 1), (b) and 3°, (a)). Under that legislation, Euroclear Bank has the special status of an "international securities clearing organism" (Article 3bis).

Securities deposited in Euroclear Bank are typically subdeposited with a network of depositories, being banks, central banks or securities settlement systems (SSS) located in the country of issuance of the security. All securities are credited to segregated custody accounts and labelled or otherwise appropriately identified as being held for Euroclear Bank. Formal legal opinions under the local laws where assets are subdeposited confirm that the securities would not be part of the general assets of the depository or the local SSS and that those assets should not be subject to attachment by those entities' creditors.

In accordance with the system's terms and conditions, Euroclear Bank accepts liability for direct losses caused by its negligence and for direct, indirect or unforeseeable losses caused by its gross negligence or wilful misconduct. However, Euroclear Bank does not accept liability for the negligence or wilful misconduct of third parties, including depositories. Under the loss-sharing provision in the terms and conditions, the loss of securities caused by any event not due to any negligence on the part of Euroclear Bank will be shared among the participants holding a position in the particular security issue in the system. Euroclear Bank is required to take all such steps as it shall reasonably deem appropriate (including legal proceedings) to effect a recovery of any securities loss on behalf of affected participants.

Euroclear Bank has insurance for general liabilities, terrorism, cyber risks, directors and officers, and employment practices liabilities.

Settlement risk

Euroclear Bank operates a DVP1 settlement system that holds both participants' cash and securities accounts on its books. Intraday finality for the batch processing and the real-time process is achieved through simultaneous book entry on the respective cash and securities accounts.

External trades settling through domestic market links established by Euroclear Bank settle effectively in the local market in accordance with local market finality rules. As a rule, Euroclear Bank will not credit a participant's account with securities before receipt by Euroclear Bank of the securities in its local account with finality.

Credit risk

As a limited purpose bank, Euroclear Bank provides system participants with banking and custody services associated with the multicurrency securities settlement activities in its system. Euroclear Bank has an external AA+ rating.

Intraday credit facilities can be granted to participants to support their settlement activity; as a rule, the intraday credit usage is secured by securities or cash as collateral on an account held and pledged in Euroclear Bank. In accordance with the Belgian law of 2 August 2002 on the supervision of financial markets, Euroclear Bank can also rely on a statutory lien which only applies to proprietary assets of a participant. Pursuant to its operating procedures, Euroclear Bank waives the statutory lien for the assets of participants' clients, except where the participant has agreed in writing that the lien should continue to apply to the client's assets credited to such securities account.

Euroclear Bank may run treasury exposure resulting from investing clients' end-of-day long cash positions. Such positions are typically re-deposited in the market with high-quality counterparties. The related risks are limited by their short duration (mainly overnight), as well as by concentration risk caps. Reverse repos are also relied on whenever possible.

Liquidity risk

Participants with long cash balances resulting from their settlement activity (net sellers) wire their funds out of the Euroclear system, whereas participants that need to cover their debit cash balances (net buyers) must repay their positions during the day (as most of their

transactions have settled in the overnight processing). To process the pay-ins and outflows, Euroclear Bank relies on its cash correspondent network.

For contingency situations, Euroclear Bank can rely on several committed liquidity sources. Structural solutions have recently been developed to allow Euroclear Bank to appropriate and immediately “monetise” the securities pledged by its top credit users in case the latter are unable to repay their credit exposures upon request. Liquidity stress and backtests are organised regularly to confirm that liquidity is adequate.

Market risk

As a rule, participants to whom Euroclear Bank has granted secured credit facilities pledge assets deposited in Euroclear Bank to secure their credit usage. The collateral valuation model of Euroclear Bank defines, at least once a day, adequate haircuts for each security, taking into account market, credit, country and liquidity risks. Valuations can also be updated in real time whenever requested. Although Euroclear Bank does not seek market risk, some degree of risk may arise if the value of its investment book falls. For that reason, the investment book is conservatively managed.

Operational risk

The Euroclear group ERM framework and its operational risk policy are outlined in Sections 4.4.1.4 and 4.4.2.5 in the descriptive Red Book chapter on the euro area.

Under the Basel II framework, Euroclear Bank adopts the Advanced Measurement Approach (AMA) to calculate capital requirements for operational risk. The information security internal control system is covered by the ERM framework for compliance with the group’s adoption of the AMA under Basel II and accords with other internationally recognised reference frameworks.

Either SWIFT or the proprietary system EUCLID can be used by Euroclear Bank participants. For each system, participants are required to perform user identification and authentication procedures.

3.7 Links to other systems

Euroclear Bank has established more than 40 links with local markets worldwide, as well as the Bridge with Clearstream Banking Luxembourg (Clearstream). The majority of the links between Euroclear Bank and local markets are indirect, via a local agent who holds a securities account at the local issuer CSD. These local agents have to meet a number of selection criteria (including financial and operational requirements) and are re-approved annually. Apart from the Bridge with Clearstream, Euroclear Bank has established more than 10 direct links.

The network of links allows Euroclear Bank to settle securities held in other issuer CSDs either on a cross-border basis (ie settlement between securities accounts held in Euroclear Bank and in the foreign CSD) or internally (ie settlement between two securities accounts held in the books of Euroclear Bank). Internal settlement accounts for the majority of Euroclear Bank settlement turnover.

3.8 Pricing

In accordance with the European Code of Conduct for Clearing and Settlement and with a view to enhancing price transparency, all Euroclear group (I)CSDs, including Euroclear Bank, disclose tariff information for all services offered, including examples of how the tariff schedules for the main services work in practice, with price examples for typical clients. This

is provided for all asset classes, including fixed income, even though the code of conduct applies currently to equities only.

Settlement fees are based on the number of settled transactions in each instrument. The average fee rate is calculated by applying a sliding scale concept to the number of instructions of each type in each instrument. This average rate is then applied to the number of instructions in the corresponding type of instrument and market for each participant's securities account.

Safekeeping fees are based on the monthly average depot value of securities held in all securities accounts in Euroclear Bank. The sliding fee concept is also applied here.

3.9 Major ongoing and future projects

For major ongoing and future projects of the Euroclear group, see Section 4.4.1.5 in the descriptive Red Book chapter on the euro area.

3.10 The use of the securities infrastructure by the National Bank of Belgium

Generally speaking, the National Bank of Belgium makes use of Euroclear Bank for two main purposes: (i) the holding and management of its own securities portfolio; and (ii) the management of the collateral offered to it by counterparties for monetary policy operations or the coverage of intraday credit facilities.

4. American Express Company

4.1 Institutional framework

American Express Company (American Express) and its primary operating subsidiary, American Express Travel Related Services Company Inc (TRS), are New York-based bank holding companies. TRS owns two federally chartered banks in the United States, Centurion Bank and American Express Bank Federal Savings Bank (AEBFSB).¹⁰ American Express is governed by a shareholder-elected board of directors, the majority of which are independent from the company.

American Express operates its own network, processes transactions, and provides business-to-business services to merchants. American Express derives its revenue primarily from card usage and secondarily from finance charges and fees.

As a bank holding company, American Express is subject to supervision and examination by the Federal Reserve. Centurion Bank is chartered as a commercial bank in the state of Utah and is regulated by the Utah Department of Financial Institutions and the Federal Deposit Insurance Corporation (FDIC). As of July 2011, the US Office of the Comptroller of the Currency regulates the AEBFSB. As a credit and charge card issuer, American Express's lending and pricing practices are regulated by various agencies in the countries in which it operates. As an issuer of stored-value instruments, American Express is subject to money transmission laws. As the operator of a card network, American Express is often subject to anti-money laundering rules and data security laws.

¹⁰ Prior to 2008, American Express and TRS were joint stock companies.

4.2 Participation

Within its general purpose card network, American Express generally acts as both a card issuer and merchant acquirer. Occasionally third-party banks might act as an issuer and/or acquirer on American Express's behalf. Participants with access to the American Express network must abide by the network's rules and meet certain financial standards. In 2010, American Express had 91 million credit cards in force worldwide.

4.3 Types of services

The majority of American Express cards are issued by TRS and its banking subsidiaries, but American Express has also established arrangements with some third-party issuers and acquirers. For most US merchants, TRS and its banking subsidiaries, Centurion Bank and AEBFSB, act as the merchant acquirer. Outside the United States, American Express's Global Merchant Services (GMS) signs merchants to accept cards, processes card transactions, and settles payments made with American Express cards. Through its network, American Express also offers a number of value added services to merchants such as rewards, fraud prevention and information services.

American Express provides charge and credit card products as well as prepaid cards and travellers cheques. American Express credit cards were used for 4.7 billion purchase transactions worldwide in 2010, totalling USD 713 billion.

4.4 Operation of the system and settlement procedures

4.4.1 Data transmission

American Express transactions typically follow a three-party payment system structure in which American Express acts as both issuer and acquirer as it connects cardholders and merchants.

4.4.2 Authorisation

American Express authorises transactions at the point-of-sale. The authorisation typically requires one step because American Express acts as both the issuer and acquirer.

4.4.3 Clearing and settlement procedures

When American Express, TRS, or one of its banking subsidiaries acts as the merchant acquirer, a transaction is settled when American Express pays the merchant for the amount charged on the card minus the merchant discount. If American Express is the acquirer but the card is issued by a third-party bank, American Express also receives financial settlement from the issuer, who receives an issuer rate. If American Express is the issuer and a third-party bank is the acquirer, American Express receives a negotiated issuer rate when settling with a merchant acquirer.

4.5 Risk management

American Express is exposed to consumer credit risk from its cardholders as well as institutional credit risk from merchants and third-party bank partners. When American Express acts as an issuer, it owns the relationship with its cardholders and therefore assesses their credit risk. In countries where American Express believes there is higher financial risk, American Express uses third-party banks as issuers. American Express reports that its credit losses are generally lower when using this model than when it acts as a credit issuer. In cases where a third-party bank acts as a card issuer or merchant acquirer,

American Express is exposed to the risk that the third-party bank will be unable to settle its financial obligations. Therefore, American Express monitors the financial health of third-party banks. Additionally, American Express may require third-party banks to post a letter of credit, bank guarantee, or other collateral.

American Express uses various technologies to prevent and identify fraudulent transactions on its network. In 2010 American Express acquired Accertify Inc, which provides solutions to help merchants prevent online and card-not-present fraud.

4.6 Major ongoing and future projects

American Express embeds ExpressPay chips in certain cards, which allows for contactless payments. Contactless payments use radio frequency technology to transmit payment information to a contactless-enabled terminal.

In 2010 American Express acquired Loyalty Partner, a company which allows multiple merchants to join together to offer a single loyalty programme with a shared rewards currency.

5. MasterCard Worldwide

5.1 Institutional framework

MasterCard Worldwide (MasterCard) is a public traded company with corporate headquarters in Purchase, New York and operations headquarters in O'Fallon, Missouri. In 2006, MasterCard restructured itself from a member-owned association of banks into a public traded company governed by a board of directors, the majority of which are independent from MasterCard's clients.

MasterCard Worldwide owns, manages, and licenses international retail product brands as well as an international telecommunications network and several processing centres. Licence-holding institutions market and issue cards to their customers in accordance with MasterCard's rules and standards. MasterCard licence holders independently set and charge fees and interest, decide on credit and spending limits, and choose which benefits should be offered to cardholders. MasterCard's revenue comes primarily from fees paid by its clients based on payments volume and services provided.

MasterCard is subject to various regulations in the countries in which it operates. MasterCard's network is often subject to anti-money laundering rules and data security laws. In addition, some jurisdictions regulate pricing policies for certain MasterCard products.

5.2 Participation

MasterCard grants licences to participants to use its brand and access its network. Licence holders must agree to abide by MasterCard's standards for membership and acceptance of its cards. MasterCard's clients are primarily financial institutions that issue its cards and/or act as merchant acquirers for merchants that accept MasterCard cards. In 2010, MasterCard had 975 million cards in force worldwide.

5.3 Types of services

MasterCard provides transaction processing and value added services through its electronic payments network. Value added services include fraud detection and card processing for debit and prepaid cards through MasterCard Integrated Processing Solutions.

MasterCard payment processing services include credit, debit, and prepaid platforms. Consumer credit processing services are offered under the MasterCard brand, which has several different operating platforms. Many of these platforms have value added services built into them such as loyalty programmes and fraud prevention. MasterCard offers MasterCard/Cirrus/Maestro-branded debit card products. MasterCard debit cards have either single-message or dual-message authorisation. Although primarily issued in the United States, MasterCard debit has also been introduced in Europe, the Asia-Pacific region, and Latin America. While Maestro is the only dual-message product that operates globally, its main presence is in Europe. Cirrus is MasterCard's ATM brand. MasterCard- and Maestro-branded cards can also be used at ATM terminals. MasterCard also provides prepaid cards, which can be used for gift, employee benefits, payroll, travel, government disbursement, and other purposes. MasterCard-branded credit, debit, and prepaid cards were used for 30.3 billion purchase transactions worldwide in 2010, totalling USD 2.0 trillion.

5.4 Operation of the system and settlement procedures

5.4.1 Data transmission

MasterCard transactions typically follow a four-party payment system structure, connecting the cardholder, merchant, issuer (cardholder's bank), and acquirer (merchant's bank). MasterCard operates the MasterCard Worldwide Network to link issuers and acquirers. The MasterCard Worldwide Network is managed through MasterCard's global operations centre.

The MasterCard Worldwide Network has both a peer-to-peer and a centralised component. Fast transactions, such as those submitted through contactless technology, are transmitted through the peer-to-peer network. More complicated transactions, such as those screened for fraud, use the centralised processing structure.

5.4.2 Authorisation

MasterCard transactions can be transmitted through a single-message or dual-message system. In a single-message transaction, a single message is submitted by the acquirer containing all the information necessary for authorisation, clearing, and settlement. Non-European PIN-authorised transactions are typically sent through the single-message system. In a dual-message system transaction, the acquirer first submits a message for authorisation and later sends a second message with information for clearing and settlement. All signature and chip-and-PIN authorised transactions are dual-message.

At the point of sale, the transaction information is sent from the merchant terminal to the acquiring bank. The acquiring bank (or its processor) turns this information into an authorisation request and then connects to the MasterCard network. MasterCard routes the authorisation request to the issuing bank (or its processor) for authorisation. If the issuer's authorisation service is unavailable, MasterCard stands in to process and authorise the transaction. Once a message is received, MasterCard routes the authorisation message back to the acquirer, who in turn routes the message to the merchant terminal.

5.4.3 Clearing and settlement procedures

MasterCard clears transactions through its processing systems. Transactions are cleared by centralised processing through the Global Clearing Management system with information relayed through the MasterCard Worldwide Network. For single-message debit transactions, the single-message system clears transactions between customers and other debit transaction processing networks.

MasterCard helps settle transactions by facilitating the exchange of funds between parties. Once clearing is completed, customers receive a daily reconciliation with their final

settlement position net of any fees. Settlement occurs between a clearing bank designated by the customer (and approved by MasterCard) and a settlement bank chosen by MasterCard.

5.5 Risk management

MasterCard guarantees settlement of all payments sent through its network and is therefore exposed to credit risk. MasterCard requires its members to meet certain standards and regularly assesses their financial soundness. A participant must meet certain standards in order to receive a licence from MasterCard including financial soundness, compliance with card design and feature standards, merchant acquiring and acceptance standards, and risk management. MasterCard assesses members' financial quality and the state of the economy in which members operate. In certain cases, MasterCard may require a participant to post collateral, typically in the form of letters of credit, bank guarantees, or secured cash accounts. Additionally, MasterCard can block the authorisation and settlement of transactions and suspend or terminate membership.

MasterCard uses various technologies to prevent and identify fraudulent transactions.

5.6 Major ongoing and future projects

MasterCard Worldwide's newer products include the contactless payment PayPass and the MasterCard Mobile Payments Gateway. Contactless payments use radio frequency technology and the MasterCard Worldwide network to send payment information to a contactless-enabled terminal. Contactless payments devices include key fobs, phones, and wristbands. MasterCard has positioned PayPass as a substitute for cash in low-value transactions. In 2010, PayPass was used at 276,000 merchant locations across 36 countries.

MasterCard launched the MasterCard Mobile Payments Gateway in Brazil in 2009. This technology facilitates routing and prepaid processing for mobile-initiated transactions.

6. Visa

6.1 Institutional framework

Visa operates worldwide through two separately incorporated entities: Visa Inc and Visa Europe. Visa Inc was formed in 2007 when four of Visa's member-owned organisations (Visa USA, Visa International, Visa Canada, and Inovant) reorganised into a single publicly traded company. Visa Inc has headquarters in San Francisco, California, and is governed by a stockholder-elected board of directors, the majority of which are independent from the company. Visa Europe is a London-based not-for-profit organisation owned and governed by more than 4,000 European member financial institutions. Visa Europe holds an exclusive, irrevocable licence to the Visa brand, products, and technology in Europe and pays royalties to Visa Inc. Visa Europe is also a minority shareholder in Visa Inc.

Visa owns, manages, and licenses international retail product brands as well as its international telecommunications network and processing centres. Licence-holding institutions market and issue cards to their customers in accordance with Visa's rules and standards. Visa licence holders independently set and charge fees and interest, decide on credit and spending limits, and choose which benefits should be offered to their cardholders. Visa's revenue comes primarily from fees paid by its clients based on payments volume and services provided.

Visa Inc and Visa Europe are subject to various regulations in the countries in which they operate. Visa's network is often subject to anti-money laundering rules and data security laws. Visa Europe's pricing policies are regulated by the European Commission. Visa Inc's pricing policies are also subject to regulation in certain countries.

6.2 Participation

Visa grants licences to participants to use its brand and access its network. Licence holders must agree to follow Visa's rules and standards. Visa's clients are primarily financial institutions that issue its cards and/or act as merchant acquirers for merchants that accept Visa cards. Approximately 2.2 billion Visa-branded cards were in circulation worldwide in 2010.

6.3 Types of services

Visa provides transaction processing and value added services through its electronic payments network, including risk management, debit card issuer processing services, loyalty services, dispute management services, and value added information services. Visa's payment processing services include credit, debit, and prepaid platforms. Consumer credit processing services are offered under the Visa brand, which has several different operating platforms. Visa provides debit processing services through the Visa Debit and Interlink Debit platforms. Interlink is a single-message point-of-sale network that generally requires a personal identification number (PIN) for authentication. Visa Debit runs on a two-message system based on credit card network technology. Visa Electron is a platform that allows issuers to require all transactions initiated from the card to be authorised electronically. It is used primarily in countries where electronic authorisation is less prevalent or by issuers targeting high-risk consumers. Visa Electron is primarily debit-based, but it can be used for credit products. In addition, the Plus ATM network is part of the Visa brand. Visa credit and debit cards and Interlink cards can also be used at ATM terminals. More recently, Visa has offered prepaid cards for gift, travel, youth, payroll, money transfer, voucher replacement, corporate incentive, insurance reimbursement, and government benefit purposes. Visa credit, debit, and prepaid cards were used for 79.5 billion purchase transactions worldwide in 2010, totalling USD 4.7 trillion.

6.4 Operation of the system and settlement procedures

6.4.1 Data transmission

Visa transactions typically follow a four-party payment system structure, connecting the cardholder, merchant, issuer (cardholder's bank), and acquirer (merchant's bank). Visa operates VisaNet, a computer and telecommunications network that links Visa's member financial institutions worldwide. VisaNet has a centralised architecture consisting of multiple synchronised processing centres, which allows VisaNet to view and analyse each authorisation transaction it processes and provide value added information such as fraud screening.

6.4.2 Authorisation

Visa transactions can be transmitted through a single-message or dual-message system. In a single-message transaction, a single message is submitted by the acquirer containing all the information necessary for authorisation, clearing and settlement. Non-European PIN-authorised transactions are typically sent through the single-message system. In a dual-message transaction, the acquirer first submits a message for authorisation and later

sends a second message with information for clearing and settlement. All signature and chip-and-PIN authorised transactions are dual-message.

At the point of sale, the transaction information is sent from the merchant terminal to the acquiring bank. The acquiring bank (or its processor) turns this information into an authorisation request and then connects to the Visa network. Visa routes the authorisation request to the issuing bank (or its processor) for authorisation. If the issuer's authorisation service is unavailable, Visa stands in for the issuer to process and authorise the transaction. Once a message is received, Visa routes the authorisation message back to the acquirer, who in turn routes the message to the merchant terminal.

6.4.3 Clearing and settlement procedures

For single-message transactions, clearing occurs at the time of authorisation. Dual-message transactions are cleared when a single daily batch message containing all of an acquirer's transactions is received. The acquirer's clearing message contains account numbers and transactions amounts. This message is received by Visa, which then calculates the issuer's settlement obligation net of certain fees.

Settlement occurs each business day. Visa uses participants' transaction information to compile each member's net position. The issuer sends funds to Visa's designated settlement bank, which in turn transfers the funds to the acquirer.

6.5 Risk management

Visa participants are required to abide by its rules and standards. Visa regularly assesses its participants' exposures and may require the posting of collateral. Visa indemnifies participants for settlement losses due to another client's failure. Other risk control measures employed by Visa include blocking the authorisation or settlement of certain transactions, limiting the use of certain types of agents, prohibiting acquiring relationships with high-risk merchants, and suspending a client's membership and access to the Visa network. Visa has its own proprietary model for assessing settlement risk.

Visa also employs a number of technologies to prevent and identify fraudulent transactions.

6.6 Major ongoing and future projects

Visa has expanded into emerging payment platforms including mobile payments. Visa's contactless payment product is Visa payWave. Visa payWave-enabled devices include cards, mini-cards, key fobs, and mobile phones. Visa recently launched its first commercial mobile payWave programme in Malaysia. Visa has also unveiled the Visa Money Transfer service. Intended primarily for markets where remittances are an important part of the economy, consumers can initiate Visa Money Transfers through an ATM, a bank branch, over the internet, or a mobile payments device.

In July 2010, Visa Inc acquired CyberSource, which offers technology and services to online merchants so that they can accept electronic payments, combat fraud, and ensure security. In addition to CyberSource, Visa Inc has expanded its online presence through Rightcliq, an online shopping tool that allows users to compare products and track packages.

7. SWIFT

7.1 Introduction

The Society for Worldwide Interbank Financial Telecommunication (SWIFT) is a member-owned limited liability cooperative established under Belgian law. SWIFT provides a communications platform together with products and services that allow its users to exchange financial information securely and reliably.¹¹ Its members are financial institutions, including central banks.

SWIFT was founded in 1973 by 239 banks from 15 countries. Since then, the number of financial institutions and countries connected to SWIFT has steadily increased. By the end of 2010, almost 10,000 financial institutions from 209 countries were connected.

SWIFT users are categorised into members (shareholders), sub-members (ie subsidiaries controlled by members) and participants. Members can benefit from all the services offered by SWIFT, whereas participants only have access to a restricted range of services related to their business. Participants include securities brokers and dealers, investment management institutions, fund administrators, money brokers and various other institutions, mainly from within the securities sector. SWIFT also admits non-financial companies, but their use of the network is restricted to corporate-to-bank communications.

Messaging services are provided to banks, broker/dealers and investment managers, as well as to market infrastructures for payments, treasury, securities and trade. Corporate-to-bank communications are also supported.

By the end of 2010, SWIFT provided services to 2,344 members, 3,331 sub-members and 4,030 participants. In 2010, SWIFT carried more than 4 billion messages. Average daily traffic is close to 16 million messages.

Customers depend on the confidentiality and integrity of SWIFT messaging, as well as the system's high availability, to underpin the security and resilience of their own critical business operations.

SWIFT also acts as a catalyst for collaborative work within the financial community to shape market practice, define standards and consider approaches to issues of mutual interest. It also allows its customers to automate and standardise financial transactions, thereby reducing costs, operational risk and inefficiencies.

7.2 Governance

SWIFT is governed by a board of up to 25 non-executive directors. The management is overseen by the board of directors, which has seven committees with delegated decision-making powers for Audit and Finance, Banking and Payments, Securities, Technology and Production, and Standards. There is also an HR Committee and a Pricing Board Task Force.

The Audit and Finance Committee (AFC) has six board directors and is a governance and oversight body for systems security, internal control and financial policy. The AFC meets four to five times per year with the management as well as the internal and external auditors to review systems security, accounting policy, reporting, auditing and control matters, as well as the balance sheet, subsidiaries and financial projections. The AFC has powers delegated from the board in these matters.

¹¹ SWIFT does not hold funds, manage accounts on behalf of customers, or store financial information on an ongoing basis. Its activities involve the secure exchange of data while ensuring their confidentiality and integrity.

SWIFT has two separate mandates for external audit: a financial audit mandate and a security audit mandate. The mandates of the external auditors are decided by the AFC.

The Technology and Production Committee (TPC) decides on and monitors large IT projects and reviews operational risks (including those related to technology and information security), which comprise a major risk category at an IT services company such as SWIFT.

Risk management is coordinated within a formal enterprise risk management (ERM) framework under the leadership of the Chief Risk Officer.

SWIFT maintains a dialogue with its users through national member groups, user groups and working groups. These bodies can be involved in strategic planning and the review of standards proposals, as well as the provision of industry feedback on major SWIFT projects or migration time frames and scenarios.

7.3 Oversight

The international dimension to SWIFT's activities is reflected in its oversight, which is based on a special agreement between the G10 central banks. Under this arrangement, the National Bank of Belgium (NBB), the central bank of the country in which SWIFT is headquartered, acts as lead overseer of SWIFT, supported by the other G10 central banks. The NBB is responsible for the day-to-day oversight relationship with SWIFT.

A technical oversight group (TG) does the oversight fieldwork and interacts with SWIFT's management. The TG reports to a senior-level group of cooperative overseers (OG) that is also responsible for setting the oversight policy. An executive group of the OG meets with representatives from SWIFT's board and management to discuss oversight conclusions.

Oversight focuses primarily on the infrastructure's security and reliability, seeking to ensure that SWIFT has appropriate structures, processes, risk management procedures and controls to effectively manage the risks it may pose to financial stability and the financial infrastructure. In this context, SWIFT's governance, management and operations are also reviewed.

Overseers bring forward issues that arise from the oversight process and make recommendations, suggestions and proposals. SWIFT explains the measures it has taken or plans to take in response to these suggestions.

The oversight objectives vis-à-vis SWIFT were clarified with the adoption of the High Level Expectations (HLEs) for the oversight of SWIFT. The publication of the HLEs has made the oversight process more transparent and has provided SWIFT with additional guidance. The HLEs are also used to frame oversight activities and provide a tool for communication both between the technical and senior level of the oversight and between the overseers and SWIFT.

This oversight body does not grant SWIFT any certification, approval or authorisation. SWIFT continues to bear the responsibility for the security and reliability of its systems, products and services.

7.4 SWIFT messaging

Known as FIN, SWIFT's core application is a store-and-forward service for the exchange of standardised messages. Financial institutions use FIN for individual messaging that requires the highest levels of security and resilience. Features include delivery monitoring and

prioritisation, message storage and retrieval, as well as validation to ensure that messages conform to SWIFT message standards.

In 2010, availability of FIN was 99.999%. FIN traffic can be broken down as follows:¹²

FIN traffic distribution by market:

–	payments	49.4 %
–	securities	43.4 %
–	treasury	5.8 %
–	trade finance	1.1 %
–	system	0.3 %

FIN traffic distribution by region:

–	Europe, Middle East, Africa	67.0 %
–	Americas	20.4 %
–	Asia-Pacific	12.6 %

SWIFT's core FIN application runs over SWIFTNet, SWIFT's internet protocol-based messaging platform. SWIFT offers a range of connectivity models and products to meet its users' various operational and business needs.

SWIFTNet also refers to the suite of services and products other than FIN that are offered over the SWIFTNet platform.

FileAct enables the transfer of files and is typically used to exchange batches of structured financial messages and large reports. FileAct supports tailored solutions for market infrastructure communities, closed user groups and financial institutions. FileAct is used for file transfers related to bulk payments, securities information and reporting, and for other purposes such as central bank reporting and intra-institutional reporting.

SWIFT also offers interactive services. InterAct complements FileAct and FIN in supporting tailored solutions for market infrastructures, closed user groups and financial institutions. With InterAct, institutions and communities can exchange messages in an automated and interactive way: an application sends a request message to another application and receives an immediate response message. InterAct is used in mission- and time-critical applications such as Continuous Linked Settlement (CLS), SWIFT's Accord matching application or real-time gross settlement (RTGS) systems.

7.5 Market infrastructures

SWIFT provides messaging and connectivity services to a large and growing number of market infrastructures.

In payments, almost 80 clearing and settlement systems rely on SWIFT for secure messaging connectivity and common message standards. SWIFT is used by market infrastructure systems for the clearing and settlement of both high-value interbank payments (such as Europe's TARGET2 RTGS) and low-value payments (such as automated clearing houses or ACHs). It is also used by the multicurrency cash settlement system CLS.

¹² Figures for 2010 from SWIFT 2010 Annual Report.

In the securities sector, SWIFT is used particularly for securities reporting by the securities market clearing and settlement infrastructures. Exchanges, matching utilities, clearing houses, CCPs and (international) central securities depositories ((I)CSDs) all use SWIFT. It is also used for the exchange of information between market players and regulators or financial authorities.