

# Electronification of payments in Europe

*In recent years, the increasing use of new communications technologies and the need for specific payment mechanisms for e-commerce have created opportunities for new intermediaries to facilitate the sending and processing of payment instructions. At the same time, banks have also developed new means for customers to access their accounts and to originate payments. Most of the initiatives are still in the early stages of adoption. Pursuant to its statutory responsibility “to promote the smooth operation of payment systems”, the European Central Bank sees itself as having two roles, namely that of a catalyst and that of an overseer. Initially, while the market is still in a phase of development, its emphasis will be on the former function. The ECB aims to provide a forum for co-operation between the stakeholders, and to offer analyses and statistics to support the work towards an integration of the various parts of the payment cycle and infrastructures in Europe. Its oversight activities as regards the electronic provision of payments will initially focus on the security of the associated instruments and systems.*

## I The changing nature of payments

A payment may generally be understood as a payer’s transfer of a monetary claim on a party acceptable to the beneficiary. For a retail transaction, the acceptable monetary claim is normally either money provided by the central bank or deposits/liabilities at a financial institution. Recently, where the regulations have permitted this, liabilities of non-banks have also been used as acceptable claims. A monetary claim that is accepted by the beneficiary will be referred to as the “means of payment”.

Payment instruments are tools for the payer to initiate the transfer of the means of payment. There are a wide range of payment instruments for transactions at the point of sale (such as debit and credit cards), for transactions to pay invoices, and to generally transfer funds between economic agents (such as credit transfer orders, either at the counter or online).

In most cases, the payment instrument and the means of payment are different. The most prominent exception is cash. Where the means of payment differs from the payment instrument, an infrastructure for effecting the transfer of the means of payment from the payer to the payee is required. The infrastructure for the transfer of liabilities between financial institutions is the interbank funds transfer system. When a payment is made on the basis of an invoice, two further aspects are also important: the delivery of the invoice to the

payer and the payee’s reconciliation of invoices sent and payments received.

In principle, information and telecommunications technology allows the entire payment process to be fully automated, including the provision of electronic means of payment. The migration towards the provision of payment services on a fully electronic and highly automated basis is called the electronification of payments. A stylised example of the payment process and its electronification is given in Box I.

Pursuant to its statutory responsibility “to promote the smooth operation of payment systems”, the ECB sees its role in the electronification of payments mainly in promoting the efficiency and security of the associated instruments and systems. Due to developments in information and telecommunications technology and, recently, the internet, the electronification of payments has increased continuously over the past few decades.

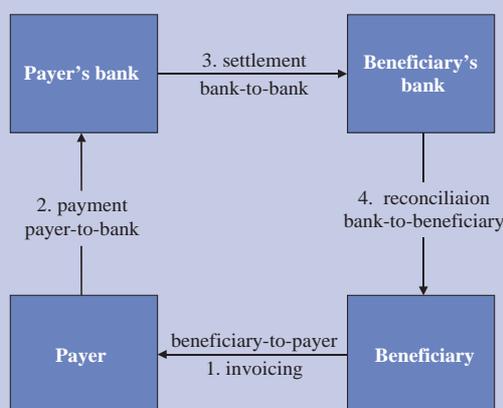
This article provides an overview of recent developments, focusing on the electronification of payment instruments for retail e-commerce. E-commerce is understood to encompass the sale or purchase of goods or services that is conducted via computer-mediated networks, such as the internet or the networks of mobile telecommunications operators.

## Box 1

### The payment cycle

A payment transaction usually involves four different parties: the payer, the beneficiary and the two financial institutions responsible for effecting the funds transfer. Communications between the parties have become increasingly automated, so that transactions are possible without manual intervention. A stylised example of a payment transaction using a credit transfer as the payment instrument is presented in the payment cycle shown in the chart.

- The adoption of electronic invoicing, which automates the billing process between the beneficiary and the payer, has thus far remained limited.
- The submission of payment instructions, or the initiation of payments, has undergone remarkable development in recent years, with the emergence of a wide variety of initiatives for electronic payment instruments.
- The interbank funds transfer systems show the highest degree of electronic communication in the payment cycle. In these systems, the automated electronic exchange of messages is widespread and has already become the standard.
- The reconciliation of balance and payment information between the payment provider and the beneficiary for book-keeping purposes (with statements and receipts) is already widely effected via electronic means between large companies and their banks, and this service is to an increasing degree also available to smaller companies.



### A variety of new initiatives in the market

A wide range of new initiatives allowing payments to be effected via the internet and mobile networks have been undertaken in Europe. Most of these initiatives are in an early stage of development; some have been successful, but many have had to close down.

A distinction can be made between traditional payment instruments that have been adapted to e-commerce and new payment instruments that have been developed specifically to serve it. The first group consists of initiatives that have leveraged existing instruments to serve new markets with no, or only minor, changes to the logic of the instruments. The familiarity of the products has led to wide and easy acceptance among the public. The second group consists of arrangements that try to

provide additional benefits or focus on specific parts of the payment cycle or on niches in the market (such as internet auction sites).

### The electrification of traditional payment instruments

The main traditional payment instruments currently being adapted to the internet and mobile networks are credit cards, credit transfers and debit instruments (such as direct debits, debit cards and cheques). Box 2 gives explanations of these instruments and their usage in Europe.

Credit cards are currently the most widely used payment instruments for making payments over the internet. The high online

## Box 2

### Use of non-cash payment instruments in Europe

A credit transfer is an instruction from the payer to his/her bank to debit his/her bank account and to credit the beneficiary's bank account. Credit transfers are the most widely used payment instruments in Europe. Around one-third of all non-cash payments are credit transfers.

Debit instruments allow the beneficiary to send an instruction to his/her bank to have purchases made by the payer charged (debited) directly to funds on the payer's account. A distinction is made between three types of debit instruments: direct debits, debit cards and cheques.

1. Direct debits are pre-authorized debits on the payer's bank account that are initiated by the beneficiary. Direct debits are often used for recurring payments, such as utility bill payments (e.g. for water, electricity and telephone usage), or for one-off payments where there is no direct contact between the payer and beneficiary. The second highest number of payments (one-quarter) are effected as direct debits.

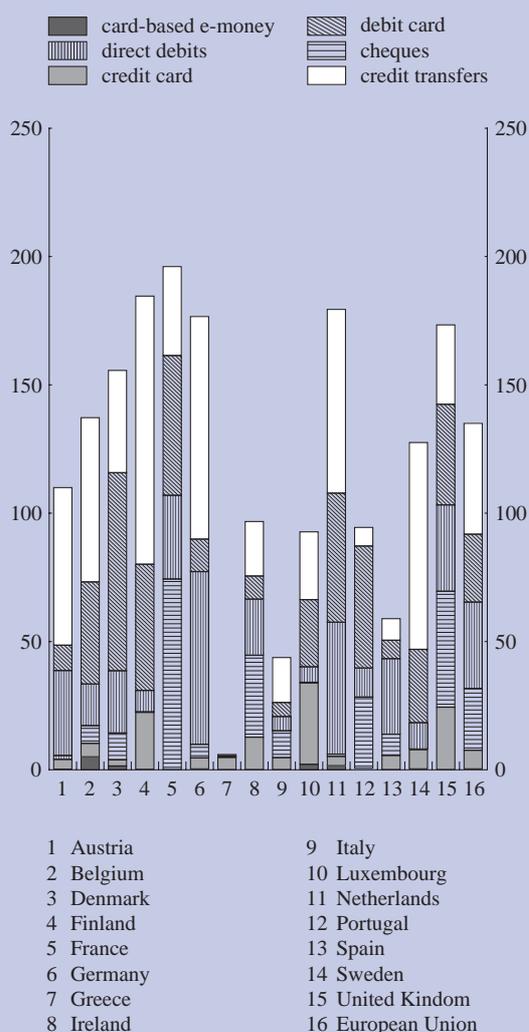
2. Debit cards provide a convenient way to present the payer information needed to initiate a direct debit. This information is embedded in the magnetic strip (or chip) on the card. A dedicated terminal is required to read the information on the debit card, and possibly to verify whether the card is still valid and whether the transaction would exceed any usage limits set for it. Debit cards are the most widely used non-cash payment instrument at points of sale. Around one-fifth of all payments are made using debit cards.

3. A cheque is a written order from one party (the drawer) to another (the drawee, normally a bank), requiring the drawee to pay a specified sum on demand to the drawer or to a third party specified by the drawer. Usage of cheques is still high in some countries, and cheque payments therefore account for between 19 and 20% of all payments effected in Europe. In many countries, however, they are virtually non-existent.

Credit cards allow customers to make purchases and/or withdraw cash as credit from the issuing credit card company. The credit granted is either settled in full by the end of a specified period, generally a month, or in part, with the remaining balance extended as credit. The former arrangement is sometimes called a delayed debit card, but in this paper – for the sake of simplicity – both variations are called credit cards. Credit cards are used for between 5 and 6% of all non-cash transactions in Europe.

### Use of non-cash payment instruments in Europe

(number of transactions per inhabitant per year)



Source: "Payment and securities settlement systems in the European Union (Blue Book)", Addendum incorporating 2000 figures, ECB, July 2002.

usage of credit cards can be explained by the fact that they are internationally known to customers and widely accepted by merchants. In many countries, the liability for a fraudulent transaction lies either with the merchant or with the credit card company. This makes credit cards especially attractive for the payer, who can be sure that he/she does not lose money as a result of fraud as long as he/she has complied with his/her obligations.

Most banks in Europe already provide their customers with e-banking applications through which online credit transfers can be initiated. E-banking is becoming very popular, and common standards are being developed in Europe. However, the use of credit transfers for buying on the internet has not yet taken off on a large scale, although some schemes have been implemented successfully in the Nordic countries.

In some countries, direct debits can also be used for payments over the internet. The procedures are comparable to those for an online payment by credit card. The payer sends his/her bank details (account number and any routing information) to the beneficiary or beneficiary's bank, and the funds are debited from the account individually. These schemes are usually restricted to use within a specific country, which makes direct debits less suitable for cross-border e-commerce.

In some European countries, debit cards can be used in internet shops. This functions similarly to the direct debit system, but offers additional security features for payments owing to the presence of the card. The cardholder authenticates his/her identity with the help of a card reader connected to the PC. The use of debit cards for purchases on the internet is still relatively limited.

An electronic "cheque" mimics the paper cheque, except that the order is in electronic form. In some jurisdictions, the absence of the handwritten signature may lead to a different legal classification of these instruments. In most European countries

cheques play an only minor role, and in countries where they are used more widely, other payment instruments and services have been developed for e-commerce.

### **New payment instruments and services**

While examples in the prior section related mainly to the presentation and transmission of payment information electronically using traditional payment instruments (e.g. credit cards, credit transfers, etc.) and traditional means of payment (commercial bank money), the examples discussed in this section are new payment instruments and related services. Providers use either traditional means of payment or new means such as electronic money or liabilities of other companies. Common to these new initiatives is the use of information and telecommunications technologies that were previously not available for payment purposes.

Electronic money (e-money) is defined broadly by the ECB as "an electronic store of monetary value on a technical device that may be widely used for making payments to undertakings other than the issuer without necessarily involving bank accounts in the transaction, but acting as a prepaid bearer instrument" (Report on electronic money, ECB, August 1998). In this definition, electronic value is comparable to cash (although, unlike cash, it need not be in open circulation) and can be stored, for instance, on a smart card (card-based schemes) or on a personal computer (software-based schemes). E-money has become a new means of payment through legislation. In Europe, the issuance of e-money is restricted to credit institutions and to companies – a type of narrow bank – that fall under the national implementations of the Electronic Money Directive (see legislative aspects below). The definition of e-money in the Directive is broader than the definition used by the ECB and can include – in addition to card and software-based e-money schemes – schemes that operate on the basis of accounts.

There are currently 25 different card-based e-money schemes in the EU, generally operated by financial institutions. On average, the high expectations of a few years ago with respect to their use have not yet been met. Card-based e-money transactions currently account for only 0.2% of all non-cash payments in Europe. They are most popular in Belgium and Luxembourg. In e-money schemes, as in many payment schemes, there are problems in achieving critical mass. There have been no recent Europe-wide roll-outs. As regards software-based e-money, most of the initiatives were closed down before they were able to operate on a wider scale.

The growing success of auction sites on the internet has led to the emergence of payment service providers which allow person-to-person payments over the internet. These have generally been termed personal online payments. The schemes operate in a similar way to bank deposits, i.e. customers open dedicated accounts with the payment service provider, and funds on these accounts can be used to make payments over the internet. They build upon traditional payment instruments (e.g. credit cards or credit transfers) to fund the dedicated accounts. The main innovation common to these initiatives is the use of e-mail and the payment provider's website for communications between the payment provider and the users, and the ease with which new accounts are created. In the European Union, banking regulations say that the means of payment in these initiatives must be commercial bank money or e-money. This means that a banking licence or licence to operate as an electronic money institution is required. Outside the EU, liabilities of non-banks ("company money") are also permitted in some countries.

A similar approach is applied in scratch cards. In these schemes, the payers' prepaid accounts are funded through cards that are sold in kiosks and shops. The prepaid accounts are held in remote servers, instead of being stored on the user's PC or smart card. The schemes also allow anonymous

payments because no registration is needed and no bank or credit card details have to be sent over the internet. Acceptance of these schemes is still limited. As in personal online payments, the means of payment can be either commercial bank money (when a bank or e-money institution is responsible) or company money.

A further type of service that builds upon traditional instruments is the payment portal. These are payment service providers that offer access to a wide range of different payment instruments and may provide merchant accounts to online retailers in general. Payment portals take care of the payment side of e-commerce operations for merchants, which can direct their customers to the payment portal's site to make online payments. After successful completion of the payment, the portal notifies the merchant that the order can be shipped.

In order to address the need to effect small-value payments on the internet, initiatives referred to here as cumulative collection services have emerged. Common to these is the accumulation of several smaller payments into a single transaction that is settled periodically (e.g. at the end of each month) as a single charge to the customer. The collection procedures can be compared to delayed payments for settling credit card bills. Two types of charge option can be distinguished: first, schemes in which the transactions are settled periodically by means of traditional payment instruments, e.g. through a direct debit from the customer's bank account or via a credit card bill, and, second, schemes in which the transactions are added to the customer's bill from a company with which he/she already has a relationship (e.g. the telephone company or the internet service provider). Cumulative collection services are not a new means of payment, but rather a layer added on top of existing products to save transaction costs. Some are aimed at micro-payments, as processing these amounts with traditional payment instruments could be very expensive for both the customer and the merchant.

**Box 3****Classification of payment instruments/means of payment**

<b>Traditional payment instruments</b>	<b>Means of payment</b>
Banknotes and coins	Central bank money
Credit transfers	Commercial bank money
Debit instruments	Commercial bank money
Credit cards	Commercial bank money
<b>New payment instruments and services</b>	<b>Means of payment</b>
Electronic money	E-money
Personal online payments	Commercial bank money, e-money or “company money”
Scratch cards	Commercial bank money, e-money or “company money”
Payment portals	Commercial bank money, e-money or “company money”
Cumulative collection	Commercial bank money, e-money or “company money”
M-payments	Commercial bank money, e-money or “company money”

*Note: In the EU “company money” is allowed in small-scale initiatives under the waiver permitted by the E-money Directive, provided it is not ruled out by other national provisions.*

The use of cumulative collection services has, however, remained quite limited.

Several initiatives have emerged for making payments from mobile telephones. These are sometimes referred to as m-payments. At present such schemes mainly offer a new payment channel to effect a credit transfer or a direct debit of funds (commercial bank money) at a financial institution. Some also offer pre-payment solutions with accounts that are accessible via mobile telephone. The funds on such accounts (e-money or company money) are used to pay for products and services. Mobile devices are well positioned for this, as they are personalised, permanently carried around, designed to be connected, and as the penetration level of digital mobile

telephones is higher than that of personal computers in Europe. It is also possible to use mobile telephones for all types of payment: at both manned and unmanned payment terminals, for internet payments and, in some schemes, also for payments between individuals. Several initiatives have been launched to promote inter-operability between different m-payment solutions. These include the MOBEY forum, the Mobile electronic Transactions (MeT) initiative, the Mobile Payments Forum and PayCircle. These fora encourage the use of mobile technology in financial services and act as a link between the various standardisation bodies in the mobile telecommunications and financial industries.

## 2 Challenges for development

Technological innovations can increase the efficiency of payments by reducing transaction costs and, thereby, increase general welfare. There are, however, many challenges which need to be met for the emergence of a safe and efficient electronic payment infrastructure.

A major challenge complicating the introduction of new payment services is their dependence on a sufficiently large network. Payment instruments derive their value from the number of acceptance points, or places where they can be used, and are therefore also called network goods. For example, the more terminals accept a certain type of

payment card, the more valuable the card will be for the user and the greater the incentive for others to join the network. A major difficulty for new network products or systems is the need to create a critical mass before they can attract other users. Customers will only join the network if enough acceptance points are available, and merchants will only offer acceptance points if enough customers are likely to use them. This “chicken and egg” problem creates high start-up costs for all types of new payment instruments and services.

Further challenges for successful electronic payments are related to standardisation and legislation, as well as to the security of the instruments and means of payment. Only through the use of common standards can the full benefits of electronification across the payment cycle be achieved. A solid legal environment for the provision of new payment services is likewise a necessity. Last but not least, the security of the services is of utmost importance both from the perspective of the payment provider and from the perspective of the public. In these areas, increased co-operation between the stakeholders involved would have obvious benefits.

### **Standardisation aspects**

It is important that common standards and message formats that allow straight-through-processing (STP) without manual intervention be agreed upon. Traditionally, standardisation in the payment business has been organised by a rather closed group of participants from the financial sector and has not been extended across national borders. The altered environment, i.e. the global reach brought about by the internet and mobile networks and the introduction of the euro, have increased the complexity of co-operation and standard-setting in several ways.

One aspect complicating standard-setting is the increased number of stakeholders in the

payment cycle, more and more of which are non-financial organisations. As depicted in Box 1, the full chain of electronic payments includes invoicing by the biller, payment initiation by the payer, payment processing and settlement by the financial institutions as well as, finally, payment reconciliation by the beneficiary. Solutions are needed that can be accepted by all stakeholders, who should ideally be involved in the development and implementation of the standards relevant to their place in the payment cycle.

Technological developments and the emergence of new providers in the market, as well as rapid developments in other fields where communications are a major element, have raised customer expectations. Customers expect faster and cheaper payments, which means that the existing interbank infrastructure, which is based traditionally on the notion of value dates and daily settlements, will need to adapt to the new environment. Current developments in payment systems include the introduction of direct and easy access (e.g. using internet technologies) and tools for managing security risks (e.g. Public Key Infrastructure), changes in timing and finality (e.g. multiple or real-time interbank settlement per day), increased capacity to carry information (to allow automatic reconciliation, for instance) and variable message formats (e.g. XML).

The consolidation and integration processes in Europe and the creation of cross-border payment systems further increase the complexity, but also raise the rewards. National standards within Europe differ considerably from one another, and the move towards European, or global, standards is costly.

### **Legislative aspects**

The European legislative framework for e-commerce consists of several directives addressing problems that could arise from online trade and payments in different legal, contractual and judicial systems across the EU (Box 4).

#### Box 4

#### Legal framework for e-commerce in Europe

A number of directives have been adopted to increase confidence in e-commerce and to promote the development of online provision of services and products. The three most important directives related to electronic payments are:

- the E-commerce Directive (Directive 2000/31/EC of the European Parliament and of the Council of 8 June 2000 on certain legal aspects of information society services, in particular electronic commerce, in the Internal Market) is aimed at ensuring the “free movement of information society services between Member States”. The directive promotes the free movement of online services through the supervision of service operators in the Member State in which they are established (“country-of-origin” principle). It also introduces transparency measures for commercial communications and “electronic contracting”, and ensures recognition of the legal validity of electronic contracts;
- the E-money Directive (Directive 2000/46/EC on the taking up, pursuit of and prudential supervision of the business of electronic money institutions) introduces a minimum set of harmonised prudential rules for e-money issuance and applies the arrangements for the mutual recognition of home Member State supervision (provided for in Directive 2000/12/EC) to e-money institutions; and
- the E-signatures Directive (Directive 1999/93/EC on a Community framework for electronic signatures) sets the framework regarding the conditions applying to electronic signatures. The Directive ensures that all Member States accept the legal validity of an electronic signature, and second, that all services relating to electronic signatures can be provided on the EU market without national obstacles.

Other related legislation includes the following:

- The Banking Directive (2000/12/EC) of 20 March 2000 provides for a European passport for credit institutions to offer services and set up branches in other Member States. It also enables credit institutions to access foreign payment systems located in the EU not only through branches established in the country concerned, but also by remote access without physical presence, provided they accept the conditions of the respective systems.
- The Regulation on cross-border payments in euro (2560/2001/EC) lays down rules to ensure that charges for cross-border payments are the same as those for payments in euro within the Member State (for cross-border payments up to (ultimately) EUR 50,000).
- The Recommendation concerning transactions by electronic payment instruments and in particular the relationship between issuer and holder (97/489/EC) includes a description of the appropriate division of liability between the consumer, the merchant and the payment service provider.

The European Commission recently conducted a consultation on a “Possible Legal Framework for the Single Payments Area in the Internal Market”.<sup>1</sup> The aim of the consultation document was to discuss the adoption of a coherent and modern legal framework for payments in the Internal Market. It envisaged a codification of various legal instruments adopted by the European Parliament, the European Commission and the Council in one comprehensive legal framework.

Given the rapid technological developments, it could become difficult for legislators to provide appropriate and up-to-date

legislation. Any additional legislative requirement related to innovative payment arrangements should therefore be assessed thoroughly on necessity, should be defined as broad principles to cover later technological developments, and should be developed in a dialogue with market participants.

#### Security aspects

Security concerns regarding electronic payments are one of the reasons most

<sup>1</sup> See [www.europa.eu.int](http://www.europa.eu.int).

commonly cited by the public not to use electronic payment instruments. Moreover, the failure of some initiatives can be attributed to the payment provider failing to offer sufficient security to protect its services. Different security initiatives have been developed for payments over the internet, but not all have been adopted on a large scale.

Several components have to be taken into account when assessing the overall security of electronic payments and online transactions, such as availability, authenticity/authorisation, integrity, non-repudiation and confidentiality. These are explained briefly in Box 5.

Many of the above-mentioned security aspects can only be achieved by combining different techniques, typically by using encryption technologies, with proper organisational measures. So far, inadequate organisational measures have been an obstacle to initiatives being successfully implemented on a large scale, while the technologies necessary to meet these requirements have been available for some time. Providing security in electronic payments is an issue not only of technology, but also of a valid business model that is accepted by customers and not too costly for its users.

Several encryption standards have been developed and initiatives launched to allow a safer transmission and storage of payment information. The most widely used protocol is Secure Socket Layer (SSL). It provides a secure exchange of data between the customer's PC and merchant's website. Usually an additional password is required to authenticate participants. Credit cards, as the payment instrument most widely used over the internet, have seen an increase in online fraud, raising security concerns for credit card companies, merchants and consumers. European banks and card schemes have recently started to actively work towards fraud prevention under the newly established European Payments Council (EPC).

At a more general level, whenever security features are discussed, the structure of incentives has to be borne in mind. The risk of being liable for the breakdown of a security feature provides a strong, if not the strongest, incentive to develop adequate security features. In the case of electronic payments, the distribution of risks and liabilities between the parties involved is therefore a key element of the development of secure payments. The obligations and liabilities of the parties involved in a payment cycle need to be clearly allocated and legally

## Box 5

### Security components

Some of the most important security components are:

- Availability: the instrument provides an efficient and timely response, has adequate capacity to support acceptable performance and is able to recover quickly from disruptions.
- Authenticity and authorisation: the instrument has appropriate means to authenticate the identity of and authorise customers using the service, and to make sure that all transactions are legitimate.
- Integrity: the instrument has the appropriate means to protect the integrity of the data in e-payment transactions. This means that e-payment-related information in transit or in storage cannot be altered or deleted without authorisation.
- Non-repudiation: the instrument uses transaction authentication methods that make repudiation difficult and establish accountability for e-payment transactions. Proof that a message has been sent and received is provided to protect the sender against false denial of receipt by the recipient, and to protect the recipient against a false claim by the sender that the data have or have not been sent.
- Confidentiality: the instrument has the appropriate means to preserve the confidentiality of relevant e-payment information. Key information should not be disclosed in such a way that it can be viewed or used by those unauthorised to do so.

documented. Those parties who carry a potential risk and cost as a result of an obligation (e.g. to maintain confidentiality or to rectify false/fraudulent payments) will have a strong incentive to take the respective security measures.

Finally, there must be awareness that the electrification of payments brings a new quality of information generated by the use of the electronic payment instruments and means

of payment. Owing to the features of information technology, electronic payments generate information that goes beyond the payment purpose (e.g. on the behavioural patterns of payers and payees, on the velocity of circulation of the means of payment, etc.). Aspects of data protection and the protection of the private sphere as well as the allocation and proper use of the valuable information generated are far-reaching matters that need to be discussed and addressed.

### 3 The ECB's interest in electronic payments

The tasks of the ECB in the area of payment systems and payment instruments include the promotion of the security and efficiency of payment systems and payment instruments, the safeguarding of the monetary policy transmission mechanism and the unit-of-account function of money, and the maintenance of systemic stability.

In autumn 2002, the ECB published an issues paper entitled "E-payments in Europe – the Eurosystem's perspective" and organised a conference to discuss the future of electronic payments and the role of the Eurosystem in this area. On the basis of these discussions with market participants, the ECB sees mainly two roles for itself – a catalyst function and an oversight function. With a view to ensuring efficiency and security, the Eurosystem's initial emphasis – as long as the market is still in a phase of development – will be on the former function.

#### Catalyst

The general public reaps the greatest benefits from electronic payments whenever the various parties in the payment process operate seamlessly together. The ECB, by acting as a catalyst for developments in the field, aims to provide a forum for co-operation between the stakeholders as well as analyses and statistics to support the work towards integration.

In 2003, the ECB decided to continue the operation of the electronic payment systems observatory (ePSO) initially launched by the European Commission in 2000. The ePSO is an open information-sharing infrastructure on electronic payments. Its aim is to foster an exchange of views between market participants and to serve as a source of information. The ePSO website can be accessed at [www.e-psy.info](http://www.e-psy.info).

Adequate statistics are vital for the business decisions of the companies providing payment services, for analysts and financiers thereof and for the public authorities setting the underlying policies. The ECB initiated work in 2002 to improve the quality and availability of aggregate payment statistics for the EU, the euro area and the accession countries. Initial results of this work are envisaged to be available in the course of 2004.

The ECB places a special emphasis on the interoperability of standards across national borders. However, standards are difficult to agree upon in the field of payments, because of the different national and international players involved, because of the particularities of network goods and also because of both changing customer demands and the restructuring of processing.

The ECB's contribution to the adoption of standards focuses on different parts of the payment cycle: the initiation of payments, the interbank leg and reconciliation. With

regard to the initiation of payments or communications between the payer and his/her bank or the payment service provider, some international standards already exist, such as the International Bank Account Number (IBAN), the Bank Identifier Code (BIC), and the electronic Payment Initiator (ePI).<sup>2</sup> The ECB encourages the use and dissemination of these standards for the electronic presentation of payments.

With respect to the interbank leg of the cycle, the ECB has carried out several analyses of interbank retail infrastructures and has formulated recommendations to improve the situation.<sup>3</sup> Central banks are often providers of interbank payment services and can therefore play a role in adapting these systems to the needs of retail payments. Special requirements created by the electrification of payments for the development of interbank settlement and clearing infrastructures will be investigated in more detail.

Most of the new payment initiatives seen at present do not change the interbank settlement process; they rely on banks to effect settlement through interbank payment systems. However, the implications of the increased use of innovative technologies for the interbank payment process could be a push towards real-time settlement, as the expectations of the general public for real-time payments are increasing and as the cost of information technology and telecommunications is decreasing, while their capacities and capabilities are simultaneously increasing.

There are no widely accepted standards at the European level for the final leg in the payment cycle between the beneficiary and his/her bank or payment service provider, concerning the synchronisation of invoice and account information ("reconciliation") for the biller's accounts. In online business, where the full benefits are realised only in end-to-end STP, this is clearly a shortcoming that increases the costs of e-commerce unnecessarily. The ECB will continue to

monitor both the implementation of existing standards and the development of new standards to enable full STP, from payment presentation up to payment reconciliation.

### **Overseer**

Within the scope of its oversight activities, the ECB is concerned with the security of all means of payment and payment instruments used by the public. A perceived or real lack of security of specific payment instruments or systems might lead to a loss of confidence in that instrument or system and could, in the extreme case, have a negative effect on the functioning of the payment systems, e.g. if reverting to other means of payment is difficult or if the loss of confidence spills over to other instruments. This holds equally true of the safety of the means of payment. This has so far been assured by the rule that payment services based on deposits can only be provided by a supervised financial institution (including electronic money institutions).

While the security of electronic payment instruments can be improved by more stringent security requirements, these can also make the system more costly for consumers, merchants and service providers, thereby diminishing the acceptance and efficiency of the service. Because of this possible trade-off between security requirements and the requirements of efficiency, the right balance between the two must be found.

The Eurosystem has started to investigate the security of specific retail payment instruments. Its common approach concerning e-money was published for consultation in the report on "Electronic

<sup>2</sup> For details, see the European Committee for Banking Standards ([www.ecbs.org](http://www.ecbs.org)).

<sup>3</sup> See, for example, "Towards an integrated infrastructure for credit transfers in euro", ECB, November 2001, "Improving cross-border retail payment services – Progress report", ECB, September 2000, and "Improving cross-border retail payment services in the euro area – the Eurosystem's view", ECB, September 1999.

Money System Security Objectives”, which contains a list of more specific security objectives for e-money schemes. These security objectives should ensure the overall reliability and technical security of the schemes, and should increase public confidence in them. They are also designed to level the regulatory playing field for the different schemes.

In July 2002, the Eurosystem issued for public consultation a set of oversight standards for

retail payment systems operating in euro.<sup>4</sup> It will soon publish the final set of standards and explain any changes made. The Eurosystem has defined these standards to ensure the smooth operation of retail payment systems that are of major importance to the economy, to ensure efficiency, safety and a level playing field for the participants of different systems and, ultimately, to foster public confidence in the euro.

#### **4 Conclusions**

The payment process is moving to a greater degree of electronification. Current developments focus on the leg between the beneficiary and the payer (invoicing) and, especially, on the leg between the payer and his/her payment provider. In recent years, a wide range of new payment services have emerged, and many have already vanished again. Thus far, the new services for payments over the internet and mobile networks have mainly consisted of traditional payment instruments that have been adapted to electronic use.

The ECB sees its role in the field as that of a catalyst and an overseer. Both functions are aimed at promoting the security and efficiency of electronic payment systems and payment

instruments. The ECB will endeavour to improve co-ordination in the market, to disseminate statistics to support business decisions and the relevant authorities’ policies, to engage in analysis concerning standards that would allow full automation throughout the payment cycle and to promote the existence of a solid legal environment for the provision of new payment services. Results of this work will be communicated to the public. Moreover, it is planned that the ECB’s oversight function as regards electronic payments will become more important than its catalyst role, once the use of electronic payments has moved beyond early development.

<sup>4</sup> “Oversight standards for euro retail payment systems”, 8 July 2002.