



EUROPEAN CENTRAL BANK

**ISSUES PAPER
FOR THE ECB CONFERENCE ON 10 NOVEMBER 2004**

E-PAYMENTS WITHOUT FRONTIERS

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Executive Summary

**Investigation into
retail electronic
payments...**

E-payments can be widely defined as payments that are initiated, processed and received electronically. The purpose of this paper is to provide an overview of a segment of e-payments, examining the latest developments and issues related to recent innovations in the area of retail payments. The scope is on e-payment services that support e-commerce transactions (business to consumer, B2C) or electronic payments between consumers (person to person, P2P) and that constitute new concepts, beyond the basic traditional payment instruments provided by the banking industry. Recent developments in the e-payments market will especially be set into a pan-European context, in order to monitor the development of e-payment services within the euro area and across Europe.

**...to continue
open dialogue
with the market**

This issues paper is meant as a follow-up to the ECB's first comprehensive issues paper and conference on electronic payments in autumn 2002. The ECB is organising a second conference on "E-payments without frontiers" on 10 November 2004, where some aspects presented in this paper will be further discussed. The ECB aims at encouraging the dialogue between different stakeholder groups across Europe in a dynamic market environment, paying special attention to innovation in retail payments that may have significant potential macroeconomic benefits, e.g. for the further development of pan-European electronic commerce in a broad sense. Further dissemination and exchange of information on e-payments is permanently offered via the "electronic Payment Systems Observatory" (ePSO, www.e-psy.info), an internet platform operated by the ECB since summer 2003 (prior to that, ePSO was a research project operated by the European Commission).

**Challenges for
innovative
e-payment**

E-payment providers face many diverse challenges while developing their services. This was one of the results of a survey among e-payment service providers undertaken by the European System of Central Banks (ESCB). Innovative schemes

schemes

come at a considerable initial cost. New services always have to compete with established basic solutions that already have achieved a critical mass of users. Consumer demand for ease of use will often favour well-known, existing payment instruments, and the merchants' wish for a broad customer base might also push in the same direction. Gaining and balancing the varying interests of both sides in a two-sided market (payer and payee) can create challenges, but also provides business opportunities, for instance as a trusted third party. The strategic balancing of cooperation needs and competition within and across industries will be discussed as another fundamental issue in this paper. Not only are the roles within the payments cycle split: the functioning and coordination of communication, transaction and delivery channels, and of shopping, payment and reconciliation platforms, similarly involve a large variety of counterparts in the transaction processes. Hence the cost-benefit distribution (including the distribution of related risks) between all parties involved in a scheme becomes a complex issue in an e-payment business model. One of the most challenging tasks in the coming years in this respect is the development of flexible, interoperable solutions and common standards.

**Ongoing changes
in the market
structure...**

The European e-payments market is not yet one without frontiers. Consumers, merchants and providers alike still show a strong home bias in their activities, although the first innovative e-payment schemes that can be used across borders and with different currencies already exist. One observation might be of specific relevance for the regulatory framework: it is becoming increasingly difficult to categorise e-payment services, since formerly specific functions and distribution channels are blurring and merging to create hybrid products, multi-channelling and new role-sharing models. Of particular interest to central banks, however, is that innovation in e-payments has generally not led to the emergence of widely used new means of payment.

**...and in the
regulatory
environment**

The regulatory framework for e-payments is further evolving. Public authorities need to reinforce overall consistent objectives, particularly regarding safety, efficiency and market integration. The Regulation on cross-border payments in euro generally applies to e-payment schemes. It restricts the providers' freedom to differentiate prices for e-payments in euro between users in different EU Member States and domestic counterparts. The European Commission intends to harmonise the legal framework for payment services, while the E-money Directive is scheduled for review. Concerning electronic money, the ECB would like to recall the potential risks that the introduction and widespread use of electronic money entail for monetary policy. However, the limited diffusion of e-money in European economies and, especially, the existence of European directives on this matter limit the risks at this stage.

Prospects for a “domestic” e-payments market in the SEPA

Many services in the field of e-payments are still restricted by national borders, despite their use of border-less communication technology and the growing popularity of the euro as a common currency. However, they also seem to be ahead of the overall retail payment market integration process.

Many new e-payment services basically rely on the existing payment infrastructure and the banking networks. Therefore they are dependent on pan-European solutions offered by the banks and cards industry. They could, however, make such traditional services more widely available, convenient and flexible to use. This might also help to increase market efficiency and enlarge the set of available options for facilitating cross-border transactions.

At the same time, the European banking industry and regulators pursue a gradual migration of payment services, standards, rules and infrastructure towards a Single Euro Payments Area (SEPA). Especially within the euro area, national borders should no longer matter, and the differences between “domestic” and “cross-border” euro payments should be shrinking. With the progress towards SEPA and the common currency forming a shared backbone, providers have opportunity to expand their services to a pan-European customer base. This could also foster the development and enhanced efficiency of new e-payment services.

Oversight focus on means of payment, efficiency and soundness

As an overseer, two aspects of developments in retail payments are of principal interest from a central bank perspective. First, the issuance of generally accepted means of payment needs to be restricted to credit institutions. Second, the availability of cost-efficient and sound retail payment instruments in the euro area must be ensured for existing as well as for emerging transaction needs via the internet, mobile phones and other innovative distribution channels.

Catalyst for market segments in a stage of early development

The ECB endeavours to act as a catalyst, seeking to improve the development and coordination of e-payments in the market, and to disseminate structural insights and statistics. With the aim of exchanging views and information, the ECB will continue to make use of the e-Payment Systems Observatory platform and to organise events on e-payment-related developments.

Introduction

The **electronification of payment services** started many years ago and has reached a high level of maturity in many European countries. The first stage of innovation, process innovation, changed the way **interbank payments** are processed but went almost unnoticed by the public. Further stages of innovation were more visible, since they affected the way that customers interacted with their banks. Most notable was the product innovation of **electronic banking**, e.g. ATMs, card payments and remote banking facilities. The banking industry was the main driving force behind these developments, which were primarily aimed at cost-saving and gains in efficiency.

Currently the electronification of payments is approaching another stage, which can be largely grouped around new business opportunities in **electronic commerce** that have arisen from the use of the internet. High-speed networks for fixed-line and wireless data transmission and communication allow new means of interaction between consumers and merchants. Many aspects of commerce have changed, including the availability of products and services and the way that customers search, order and pay for them. Equally, they facilitate a larger variety of remote interactions with banks. This development can lead to greater efficiency and convenience, especially if purchasing, invoicing and payment solutions are interoperable or integrated in ways that allow straight-through processing of transaction data. In addition, the telecommunications industry and other non and near-banks are now offering payment-related services.

The **purpose** of this paper is to provide an **overview of recent developments and issues related to the electronification of retail payments and recent innovations in this field**. The scope will be on payment-related services that support e-commerce transactions (business to consumer, B2C) and/or electronic payments between consumers (person to person, P2P), discussing new concepts beyond traditional payment instruments provided by banks. Recent developments will especially be set into a **pan-European context**, with the aim of identifying obstacles to the further development of e-payment services across Europe.

The paper is structured as follows. After an introduction with working definitions (Chapter 1), a first set of major issues and obstacles is identified from the e-payment service providers' perspective (Chapter 2). Chapter 3 then addresses the observations on the market structure of e-payments and recent developments in the field. This is followed by the driving forces of demand, looking separately at payer/consumer and payee/merchant aspects (Chapter 4). Chapter 5 analyses some basic economic issues such as the balancing between interest groups, cooperation versus competition, as well as cost, efficiency and prices; it also addresses current practical challenges of security and prospects for European market integration with regard to e-payment markets. Selected regulatory aspects and the approach of central banks are highlighted in Chapter 6. The paper concludes with an examination of the outlook for e-payments (Chapter 7).

1. What are electronic payments? An update of definitions

Based on previous publications by the European Central Bank, the Box below provides working definitions of the most relevant terms that will be used in this paper.

Box: Working definitions

E-payments¹ are payments that are initiated, processed and received electronically,² whereby

- a **payment** is the payer's transfer of a monetary claim on a party acceptable to the payee;³ a monetary claim that is accepted by the payee will be referred to as the **means of payment**; **payment instruments** are tools and procedures to initiate the transfer of the means of payment⁴;
- for e-payments, the monetary claims (**electronic means of payment**) are held, processed and received in the form of digital information, and their transfer is initiated via electronic payment instruments.⁵

A legal definition of **electronic money**⁶ is provided in Article 1 of the European Parliament and Council Directive 2000/46/EC on the taking up, pursuit of and prudential supervision of the business of electronic money institutions (E-money Directive). According to this definition, "electronic money shall mean monetary value as represented by a claim on the issuer which is: (i) stored on an electronic device; (ii) issued on receipt of funds of an amount not less in value than the monetary value issued; (iii) accepted as means of payment by undertakings other than the issuer."⁷

Mobile phones and other wireless communication devices offer new ways to access accounts and to use payment services. Payments initiated through mobile phones etc. are called **mobile payments**. They are a sub-group of electronic payments.

¹ This working definition may not suffice other, e.g. legislating, purposes. This paper focuses on a subset of e-payments, i.e. electronic services that make use of new technologies to enable innovative variations of payments for consumers.

² See also ECB, E-payments in Europe – the Eurosystem's perspective, Issues paper, September 2002.

³ Definition taken from the ECB "Blue Book", 2001.

⁴ "Means of payment" is sometimes also used as a synonym for payment instruments. In this paper, however, it depicts the type of monetary claim transferred for making a payment. It may take, for example, the form of coins or banknotes or units stored on a prefunded electronic chip card. If these assets are accepted by general consent, they may constitute money in an economic sense. In economic theory, money performs three different functions: (1) a unit of account; (2) a means of payment; and (3) a store of value. For example, short-term deposits with credit institutions also serve the economic purposes of money. The economic concept of money includes general acceptability as means of exchange as an important element. This concept may comprise more types of money than are legally defined. A legal definition of a money type, in reverse, does not automatically lead to a broad acceptance or include a mandatory acceptance rule (see, for example, legal tender and acceptance rules in the Netherlands).

⁵ "Cross-border electronic payment transactions" are also defined in Article 2 of Regulation (EC) No 2560/2001 of the European Parliament and of the Council of 19 December 2001 on cross-border payments in euro.

⁶ According to the "Report on electronic money" published by the ECB in August 1998, "electronic money is broadly defined 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". ECB, Issues arising from the emergence of electronic money, Monthly Bulletin, November 2000.

⁷ The E-money Directive restricts the business activities of electronic money institutions (ELMIs) to the issuing of electronic money and to closely related financial and non-financial services, e.g. administering of electronic money and of other means of payment, but excluding the granting of any form of credit; and to the storing of data on the electronic device on behalf of other undertakings or public institutions. Directive 2000/46/EC of the European Parliament and of the Council of 18 September 2000 on the taking up, pursuit of and prudential supervision of the business of electronic money institutions, available at http://europa.eu.int/eur-lex/pri/en/oj/dat/2000/l_275/l_27520001027en00390043.pdf

Clearing is the process of transmitting, reconciling and, in some cases, confirming payment orders prior to settlement. It can also include the **netting** of instructions (= the offsetting of several positions or obligations between trading partners or participants) and the establishment of final positions for settlement. **Settlement** is an act of discharging obligations related to payment transactions between two or more parties.⁸

In practice, monetary claims used for e-payments constitute either claims held with commercial or central banks (deposit balances), or electronic money (e-money). New Community legislation permits e-money as a new means of payment.⁹ Recently, where the regulations have permitted this, liabilities of non-banks have also been used as acceptable claims (see also classification in Table 1, also used later for categorising schemes in Chapter 3).¹⁰

Table 1 Classification of payment instruments and means of payment¹¹

Basic payment instruments		Means of payment
	Banknotes and coins	Claims against the central bank (central bank money)
	Credit transfers	Claims against commercial banks (commercial bank money)
	Debit instruments, including credit and debit cards	Claims against commercial banks (commercial bank money) ¹²
New payment instruments and related services		Means of payment
	Electronic money and pre-funded payment schemes	Claims against e-money institutions (e-money), against commercial banks (e-money) or against companies (“company money”)
	Cumulative collection services	Claims against commercial banks, e-money institutions or companies
	Payment portals and integrated payment solutions	Claims against commercial banks, e-money institutions or companies
	Mobile payments (m-payments)	Claims against commercial banks, e-money institutions or companies

Note: Claims against commercial banks are also called bank deposits. In the EU, the provision of bank deposits and electronic money is restricted to credit institutions.¹³ Claims against companies (“company money”) are not lawful in the EU as a general means of payment. Interbank claims in commercial bank money are often settled via accounts at the central bank (central bank money). It should furthermore be noted that cash and e-money can be considered both as a payment instrument and as a means of payment.

With the general exception of cash and cheques, almost all other types of claims (means of payment) are recorded and kept with the help of IT systems. They can be transferred by using either paper-based or electronic payment instruments. Some payment instruments such as credit transfers and cards can

⁸ ECB, Blue Book, Payment and securities settlement systems in the European Union, third edition, June 2001.

⁹ Directive 2000/46/EC on the taking up, pursuit and prudential supervision of the business of electronic money institutions (E-money Directive).

¹⁰ ECB, Electronification of payments in Europe, Monthly Bulletin, May 2003.

¹¹ Slightly amended version of Table 3 in ECB, Electronification of payments in Europe, Monthly Bulletin, May 2003.

¹² Credit card issuers and acquirers do not need to be commercial banks in all European countries; therefore claims can also be made against non-bank companies.

¹³ According to Directive 2000/28/EC of the European Parliament and the Council, credit institutions are either undertakings whose business it is to receive deposits/other repayable funds from the public and to grant credits for its own account, or that are e-money institutions.

be used for both paper-based or electronic transactions (e.g. either in paper form with payment authorisation via signature, or initiated by using a card and personal identification number (PIN) at a terminal). In practice, payments can also be carried out following a combination of electronic and paper-based steps, e.g. if the receiver does not have a bank account or if a cheque is truncated and processed electronically. Similarly, payments can also be carried out in a combination of cashless and cash-based steps, e.g. if one recipient does not have a bank account. An increasing number of payments are completed on a fully electronic basis. In principle, information and telecommunications technology allows the entire retail payment process with commercial bank or electronic money to be fully automated.¹⁴

2. What are the main issues?

The degree of transparency concerning what electronic payment systems are available or how their usage figures are developing is still not very high, especially across country borders. In the process of creating a Single Euro Payments Area “without frontiers”, this could be a valuable subject for future investigation.

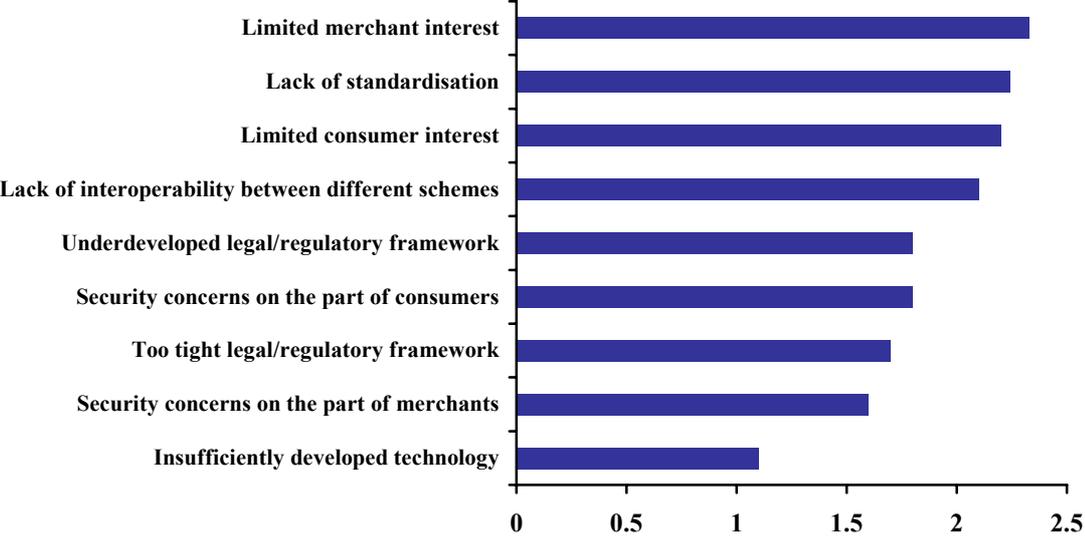
The ESCB has carried out a survey among providers of innovative payment services within the EU-25. It aimed at collecting an up-to-date overview of new e-payment-related services for retail e-commerce in Europe, and also investigated pan-European activities. The survey was conducted via an online questionnaire at the electronic Payment Systems Observatory (ePSO).¹⁵

This survey also asked e-payment service providers for their opinions on the obstacles for the development of their business (see Figure 1).

¹⁴ ECB, Electronification of payments in Europe, Monthly Bulletin, May 2003; full automation can also include a larger set of related processes besides payments, e.g. electronic bill presentment, trading, etc.

¹⁵ The **e-Payment Systems Observatory** (www.e-psy.info) is designed to serve as an internet-based platform for information exchange. ePSO was formerly a research project financed by the European Commission from 2000 until 2002. Since summer 2003, the ePSO has been operated by the ECB. The **survey** was carried out by the ECB with the help of the 25 EU national central banks. An overall response rate of 50% was achieved. More detailed results and information on single schemes will soon be published on the ePSO website. The response rates and the number of responses from e-payment service providers vary substantially between countries. The information collected through the survey is therefore not representative. However, a continuation and updating of the survey, including more providers and schemes, is already envisaged.

Figure 1 “To what extent do the following factors hinder the development of the payment services you offer?”*



* Averages, selected scores between 0 (very little) and 4 (very high), N= 75 European e-payment service providers.

Note: The variation of the grades given was significantly high (standard deviations between 1.17 and 1.29), indicating a high degree of uncertainty.

The results provide an initial indication that creating efficient solutions with significant **added value for merchants** is one of the major challenges for the industry, and is even ranked as being slightly more important than **standardisation** issues and lack of interest on the consumers’ side. Putting standardisation issues in second place may indicate that there is considerable competition between different schemes, especially in the acquisition of merchants. However, standardisation issues are only ranked marginally higher than the need to awaken the **interest of users**. The fourth most important item relates to the lack of **interoperability**, which – together with standardisation – is a highly relevant factor, especially for schemes opening their services to users in several countries. The **regulatory framework** is considered more as underdeveloped (ranking fifth) than as too tight (ranking seventh). Comments on this question indicate that the providers’ main concern is rather related to uneven or uncoordinated regulatory treatment in different countries. This observation underlines the relevance of a common legal framework (see also Section 6.1). Ratings in the survey for all factors below rank 4 resulted in average values below the “neutral” value of 2 for medium relevance. **Security concerns** expressed by consumers or merchants were not regarded as particularly important and ranked rather low (ranking sixth and eighth). The providers judged the **development of technologies** not to be a particular obstacle for wider acceptance, which is reflected in the lowest ranking value of all factors.

In the following chapters, the different challenges and obstacles that were highlighted by the survey will be discussed in more detail. Factors indicating high or “limited interest” of merchants and consumers in e-payments are addressed in the following sections (Chapter 4, Sections 5.1 and 5.3). Standards and interoperability will be touched on in the context of cooperation and competition issues (Section 5.2) and of a “domestic” e-payments market within the Single Euro Payments Area (Section 5.5). Selected security issues, especially in the area of technological developments, are addressed in Section 5.4.

3. What services are offered?

3.1 Product categories

After looking at what might be needed by the different user groups, this section groups different business concepts into clusters to provide an overview of what types of e-payment services are currently offered. The structure is based on the classification of payment instruments from Chapter 1, differentiating between innovation in the context of “basic” payment instruments and in the emergence of “new” e-payment-related services.¹⁶ Thus a distinction can be made between traditional payment instruments that have been adapted to e-commerce, and new payment instruments that have been specifically developed to serve it. Category sheets for both groups can be found in Annex 1 - Category sheets for payment concepts, while the main text introduces the categories – including a Box highlighting the history of e-money and pre-funded schemes – and provides some general market observations.¹⁷

1. **Basic payment instruments:** The first group consists of concepts that have leveraged existing payment instruments to serve new markets with no, or only minor, changes to the logic of the instruments. Their popularity and long history of usage ensures wide and easy acceptance by the public. This cluster contains four categories: (electronic) credit transfers, (electronic) direct debits (excluding cards), (electronic) credit card payments, and (electronic) debit card payments.
2. **New e-payment-related services:** The second group consists of newer arrangements that generally try to provide additional benefits, or focus on specific parts of the payment cycle or on niches in the market. The examples in the previous section mainly cover adaptations of traditional

¹⁶ The terms “basic”, “new” and innovative” are applied in a pan-European context, but might need a different categorisation of single payment instruments in individual countries. For example, in some countries the introduction of electronic credit transfers for consumers would belong to the category of “new” services, whereas in others, some e-payment services categorised as “new” might already have a relatively long history (e.g. pre-funded services or cumulative collection offered by telecommunications operators).

¹⁷ For details on single systems or countries, see the “ePSO Inventory of e-payment services” database, www.e-psy.info, and previous ESCB publications (e.g. Helen Allen, Innovations in retail payments: e-payments, Bank of England, Quarterly Bulletin, Winter 2003; Roland Uittenbogaard, Paying on-line any time, anywhere? De Nederlandsche Bank, Quarterly Bulletin, September 2003; ECB, Electronification of payments in Europe, Monthly Bulletin, May 2003). International country reports by central banks were collected and published in CPSS, Study on electronic money, internet and mobile payments, Bank for International Settlements (BIS), Basel, March 2004, www.bis.org/publ/cpss62.pdf

payment instruments and existing means of payment for their use in a new technological environment. The categories clustered in this section are newly developed payment instruments and related services. They either use existing means of payment or other means of payment such as e-money or pre-funded liabilities issued by other companies. Common to these new initiatives is that they are based on the use of information and telecommunications technologies that were previously not available for payment purposes. The cluster contains the following categories: electronic money and pre-funded payment schemes, cumulative collection services, payment portals and integrated payment solutions, and mobile payments. The first of these categories can be further divided into three sub-groups, sorted according to their history of emergence (see also the Box below): i) chip card and software-based prepaid schemes (electronic purses); ii) disposable and virtual pre-funded cards; and iii) pre-funded (personal) online payments.

Box: Electronic purses and the history of e-money development

The first generation of pre-funded electronic payment schemes was based on **chip cards**, with monetary values protected and managed on the chip of a smart card (hence functioning as an “electronic purse”). Such cards were introduced in the 1980s for single-purpose prepaid services (e.g. for paying meals at a local canteen, as electronic forms of loyalty schemes or as prepaid telephone cards) and for multiple purposes, especially to replace low-value cash payments at the point of sale. The latter group of schemes was started with high ambitions of becoming a widely accepted substitute for cash, in some cases also for payments between private persons. Consequently, European national central banks considered the values stored on widely accepted multipurpose chip cards to constitute a new type of means of payment called electronic money.¹⁸ A discussion among public authorities was held to establish if and to what extent such prepaid card schemes might need rules or business restrictions, e.g. in order to safeguard the monetary order. This debate gained further momentum with the emergence of the internet during the 1990s, when a second group of prepaid schemes raised the attention of regulators.¹⁹ This new group of schemes was named **software-based e-money**. This type of e-money is managed by software that needs to be installed at the user’s local computer (or any other electronic device with an integrated online communication function). It does not require the use of specific, protected hardware for the storage of e-money values and is hence less costly to set up than e-money based on chip cards. Most of the first generation software-based e-money schemes were however fairly short-lived owing to limited use, and have today nearly vanished from the market.

Meanwhile, **new types of e-money** schemes are being introduced based on enhanced technology. A dominant form of such new e-money systems is that they are server-based, i.e. that funds are not stored locally on chip cards or computers, but kept at a central server (e.g. at the issuer). They promise their users greater convenience and lower set-up costs than the first generation of e-money. These systems can be divided into two sub-categories: one concept consists of new types of e-money accounts that can be based on e-mail addresses or mobile phone numbers, etc; the other sells prepaid funds of fixed amounts by providing a simple access number

¹⁸ European Monetary Institute (EMI), Report on prepaid cards, 1994.

¹⁹ See for example BIS, Implications for central banks of the development of electronic money, Basel, October 1996; BIS, Security of electronic money, CPSS publications No 18, August 1996.

to the funds that can be entered for spending (see Annex 1 – Part 2.1 for further details). Most of these newer generations of pre-funded payment schemes may not fit exactly into the initial definitions of e-money systems. However, the categories of card and software-based schemes are still officially in use, e.g. for data collection and monetary **statistics** by the ESCB (see Figure 2 below).

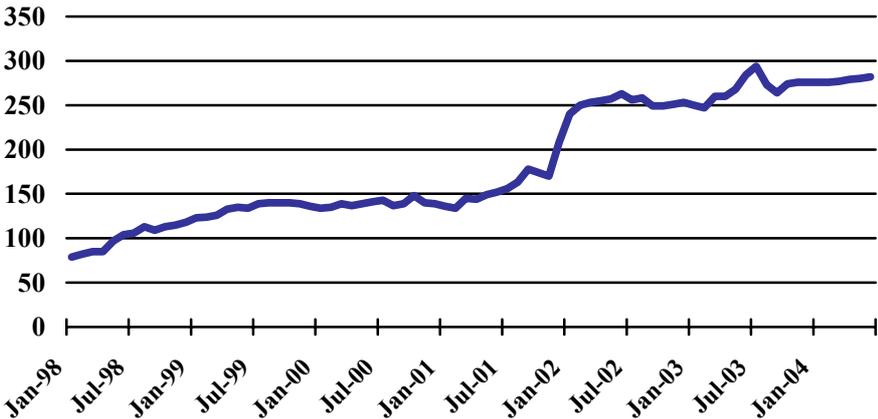
There was a marked increase in e-money issuance right before the euro changeover, and there was also some increase during the first half of 2003. Since then, and especially during the last few months, the amount of e-money in circulation has markedly stagnated. The number of e-money transactions effected in the EU-25 in 2002 represented a share of 0.5% of all cashless payments.²⁰

From a monetary policy perspective the diffusion of e-money implies certain risks:

- The e-money issuance might decrease demand for banknotes and coins (one of the autonomous factors in forecasting the structural liquidity position for the banking sector) and traditional bank deposits (the element of the reserve base). One consequence might be instability of money demand, with detrimental effects on the ability of central banks to formulate and conduct monetary policy. The eroding demand for banknotes and coins may lead to the shrinkage of the central bank balance sheet and the structural liquidity deficit, thereby complicating monetary policy implementation.
- Moreover, there is a possibility of a reduction of seigniorage income arising from a lower demand for banknotes given substitution into e-money as a means of payment. This may lead to a reduction of central bank revenue and, ultimately, to the limitation of central bank financial independence.

However, the limited diffusion of e-money in European economies and, especially, the existence of European directives on this matter (Chapter 6), limit the risks described above.

Figure 2 Euro area e-money volume in EUR millions (end of month, not seasonally adjusted)



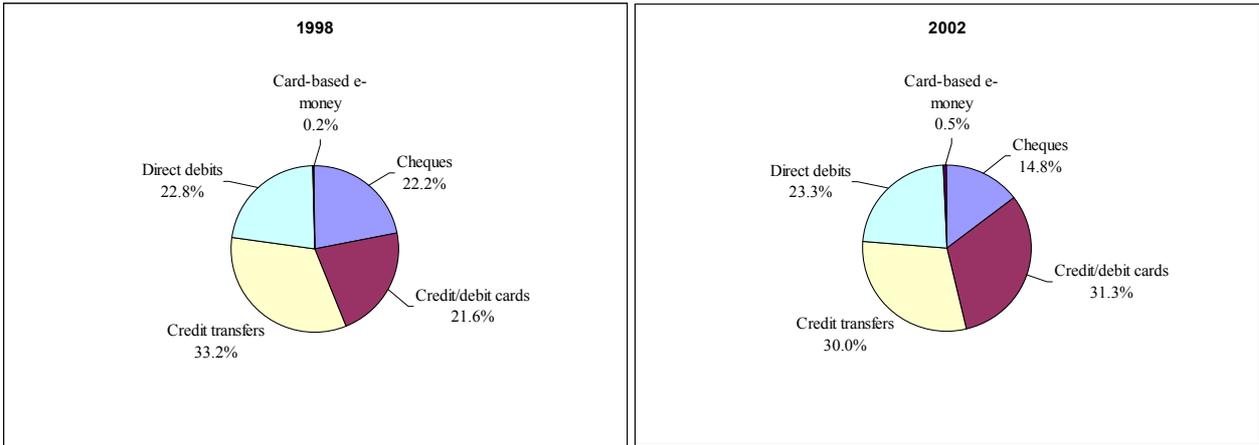
Source: ECB monetary statistics (2004).

²⁰ Figures from the ECB’s Blue Book (2004).

3.2 General observations

The “**electronification**” of basic payment services is already extremely advanced in most countries.²¹ The main traditional payment instruments in the European Union currently being used or further adapted for online use are credit cards, credit transfers and debit instruments (such as direct debits, and sometimes also debit cards or so-called electronic cheques²²). The traditional instruments that are in technical and organisational terms hardest to migrate completely to electronic substitutes are cash and (to a lesser extent) cheques. These two are also the payment instruments least suitable for paying digital content. Figure 3 shows the development of market shares between different traditional payment instruments at a pan-European level (also including a small share of e-money transactions). The cheque as a purely paper-based instrument has lost significant market share against those payment instruments that can work electronically.

Figure 3 Use of cashless payment instruments within the EU-25, based on total number of transactions



Source: ECB Blue Book, addenda incorporating 2002 figures (2004).

Most of the new initiatives observed at present do not change the interbank settlement process, but use current systems where settlement is effected through banks in interbank payment systems. This is why their usage is also mostly incorporated into the figures above. Credit transfers are specifically popular for online transactions in countries with a strong established user base. They also have a broad usage

²¹ For instance, the Finnish statistics for 2003 revealed an automation share of 94% of all payment transactions carried out by banks; see www.pankkiyhdistys.fi/sisalto_eng/upload/pdf/statistics.pdf

²² A cheque is a written (paper-based) order from one party (the drawer) to another (the drawee, normally a bank), requesting the drawee to pay a specified sum on demand to the drawer, or to a third party specified by the drawer. Cheque usage has remained high in a few European countries, and in 2002 cheque payments therefore still accounted for 15% of all payments effected in the European Union. In many countries, however, they are virtually non-existent. Other payment instruments and services have been developed for e-commerce in countries where cheques are still widely used. The “electronic cheque” for instance mimics the paper cheque, except that the order is in electronic format rather than in writing. In some jurisdictions, the absence of the written form may lead to a different legal classification.

as business-related and interbank payments. In terms of transaction volumes, credit transfers have only recently lost the leading position of instrument share to card transactions in Europe, if debit cards and credit cards are counted together. Card products generally provide the most advanced infrastructures allowing cross-border use in Europe. Interbank initiatives have brought about enhanced efficiency and connectivity for credit transfers, based on a set of agreements and standards. As an example, the Credeuro Convention was established in November 2002 as a standard for the execution of basic interbank pan-European credit transfers. On a voluntary basis, it enables participating banks to guarantee their customers certain information and a maximum execution time of three working days. However, the development of a standard for pan-European direct debits is still in an early development stage (see also Section 5.5 on the prospects for a “European domestic” e-payments area).

Major changes observed in the field of e-payments can be summarised under the broad headline “expanding options and merging business fields”.

- The **technical development** focuses on innovative ways for identification, authentication and authorisation, and of creating and validating payments, and has been mainly driven by non-banks (i.e. IT and the telecommunications industry, application and service providers). Context-sensitive payment solutions can be tailored to the merchants’ needs (i.e. customers, values, other contextual data).
- **Hybrid products** (“innovation by combination”): There is an increasing overlap between different service categories. An example of a hybrid product is the introduction of pre-funded virtual credit cards, a combination of pre-funded dedicated accounts on the consumers’ side which are transformed into (virtual) credit card numbers on the merchants’ side (e.g. Moneta Online, Italy).
- **New scopes/role-sharing**: Vast opportunities for integration, cooperation and role-sharing along the value chains of transactions as well as of communication services could offer added value and economies of scope. Examples of this include co-branding, e-tickets tied to credit cards, bonus points stored on chip cards or on mobile phones.
- **Multi-channelling**: Services and applications with market maturity that were initially designed for specific distribution channels (internet access, mobile communication networks, point of sale (POS)) are adapted for other usage or used as supporting tools (e.g. mobile phone messages to confirm card payment authorisation).
- **SEPA**: The banking industry is making progress in establishing common rules and standards for pan-European basic payment instruments in the context of the Single Euro Payments Area. This will most certainly also provide a positive impetus for the European e-payments market. On the other hand, e-payment innovation has so far brought about few changes to interbank core functions such as final settlement processes, or the use of commercial and central bank money as major settlement assets (see also further details in Section 5.5).

The expansion of technical possibilities and product features makes a clustering of e-payment services (like the one provided in the annex) increasingly difficult. What remains at the centre of interest for central banks, however, is that innovation in e-payments has generally not led to the emergence of widely used new means of payment. When such new means of payment appear, they have to comply with the E-money Directive and banking legislation. Deposit-taking must be limited to credit institutions.

4. Are e-payments needed? Driving forces of demand

The terms and conditions of most retail payment schemes provide a clear differentiation between two user groups or functional roles, i.e. those of the payer and the payee. For instance, a credit card scheme is traditionally designed to be used in business-to-consumer (B2C) commercial transactions, allowing consumers to pay (payer's function), and merchants to accept payments (payee's function). In such a basic card scheme, the payment flows are generally directed from consumers to merchants. This phenomenon has been referred to as *two-sided markets*.²³ Two-sided markets are characterised by networks or platforms with two distinct user groups whose benefit is mutually dependent on the other. To succeed, platforms with a two-sided market structure must define business models that attract each side, while still making an overall profit ("get both sides on board", e.g. address the so-called chicken and egg problem). Only very few payment services are "symmetrical" in the sense that any user can take both roles as payer and payee under one set of rules. Such a symmetrical platform quality is for instance needed to offer person-to-person payments. Credit transfers and cash payments for instance offer such a symmetrical usage design.

This chapter follows the concept of two-sided markets by looking separately at driving forces on the payer's and payee's side. It concentrates on the basic case of a purchase and payment transaction between a merchant and a consumer (B2C e-commerce, i.e. delivery from a business to a consumer, and vice versa a means of payment flow). However, the need for symmetrical e-payment solutions between individuals (person-to-person, or P2P, payments) and of other e-payment-related service segments such as business-to-business, government-to-consumer, etc. will at least be also partly covered.

4.1 Payers (consumers)

There is no simple way to monitor and assess the interest and motives of European consumers in using e-payments, or their demand for pan-European solutions. Results depend on individual payment habits, incentives, experience and trust in the use of the internet/mobile phones for buying goods and

²³ According to Rochet and Tirole, many if not most markets with network externalities are two-sided. A typical characteristic of two-sided markets is that price structures favour one group of users against the other, i.e. the platforms can effectively cross-subsidise between the different users. See Jean-Charles Rochet, Jean Tirole, Platform competition in two-sided markets, November 2001.

services, cost-benefit considerations in the context of concrete payment situations and of available alternatives, and many more factors. Hence, the demand is as diverse as the payment culture in different European regions or individual attitudes towards using new technologies and trends.

Currently, the measurable **consumption of cross-border payment transactions** in the EU is still low. Cross-border cashless payment transactions only account for roughly 1% of all payment transactions within the EU.²⁴ Surveys indicate that the share of cross-border e-commerce transactions in Europe is around 10%. These transactions trigger a need for cross-border payments. The growing volume of e-commerce is hence becoming a major driver of demand for cross-border payment services in general. Many e-payment schemes, especially those that can be used for cross-border payments, are based on the use of traditional payment instruments and processing channels of the banking and cards industry.²⁵ Therefore, statistically they can be hardly separated from “traditional” payment instruments.

A poll undertaken in 2003 on behalf of the European Commission investigated the demand for e-commerce amongst consumers.²⁶ The report states that e-commerce is “still not widely used” (with only 16% of all EU citizens making use of it). This is explained by the fact that the majority (57%) cannot buy on the internet simply because they have no **access** to it. Moreover, the majority of those that do have access (55%) are not interested in e-commerce and prefer to physically select the goods they want to acquire.

However, the access restrictions to communication and data services may be a shrinking obstacle, as can be illustrated by the fast growth in figures for internet connections via fixed lines and even more via mobile networks in all European countries. The use of the new technologies creates new situations where payments may be needed. New technology also generates new options of payment initiation or billing, with a chance of higher **convenience** and **added value**. As an example, online banking services offered via the internet have become a major distribution channel for banking services (including payment transactions)²⁷, at least for certain groups of customers.²⁸ Another example often quoted is the high potential of mobile payment services.

²⁴ For example, see estimation figures in European Card Review, September/October 2003, p. 22.

²⁵ According to figures provided in the European Card Review, the most important payment instruments in the EU with the highest shares of cross-border transaction are cards (83.2%), followed by credit transfers (16.5%) and a small residual of cheques (0.3%). Source: EFMA/TARGET/ECB, McKinsey analysis – EU-15 2001, European Card Review, September/October 2003, p. 22.

²⁶ See <http://europa.eu.int/rapid/pressReleasesAction.do?reference=IP/04/338&format=HTML&aged=0&language=en&guiLanguage=en>

²⁷ For instance, statistics of the Finnish Bankers Association indicate that 57% of all Finnish consumers had used online banking services for payment transactions by April 2004. See www.pankkiyhdistys.fi/

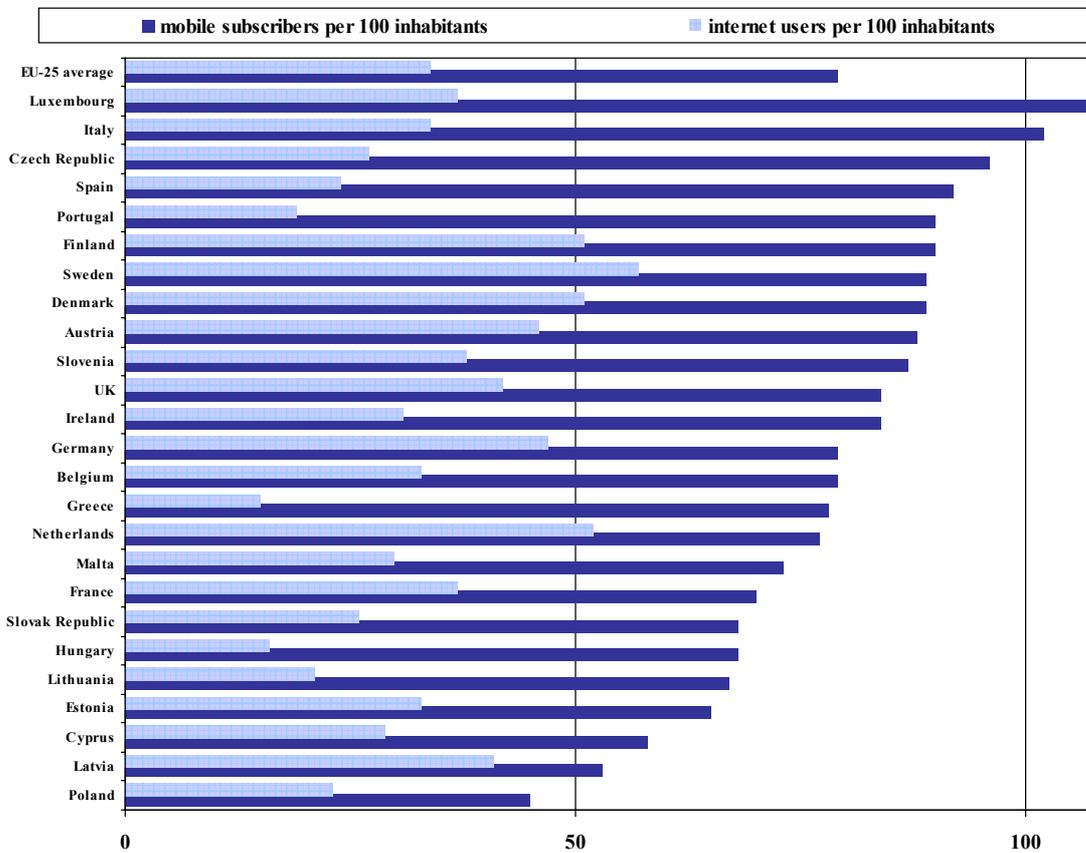
²⁸ The European Financial Management & Marketing Association (EFMA) and partners published a study in July 2004 entitled “Internet banking, a new wave?”, which presents results of a survey amongst 1,016 European users of online financial services. It shows that the internet has become the banking channel with the highest degree of customer satisfaction (57% very satisfied, against 35% for bank branches and 29% for telephone banking). The high degree of satisfaction is mostly related to ease of access (69% very satisfied, against just 9% for branch banking).

Box: Potential benefits and readiness to use mobile payments

The increasing popularity of mobile phones, personal digital assistants and other devices for wireless communication might offer potential benefits to users, e.g. as a convenient means of access to online services, including payment solutions. Mobile devices could be well positioned for this, as they are personalised, carried around permanently, designed to be connected, and have a penetration level even higher than that of personal computers or internet usage in Europe (see Figure 4).

Some countries have already reached a stage where the average citizen owns more than one mobile phone, while in only very few EU countries has the penetration level not yet reached an average coverage of two-thirds of the population. It is possible to use mobile telephones for all types of payments.²⁹ Studies on the status of pilot initiatives indicate that there may also be a readiness to use mobile devices for payment transactions.³⁰ However, the diffusion progress of mobile schemes is often slower than expected, and demand tends to develop reluctantly.

Figure 4 Countries sorted by level of penetration of mobile phones



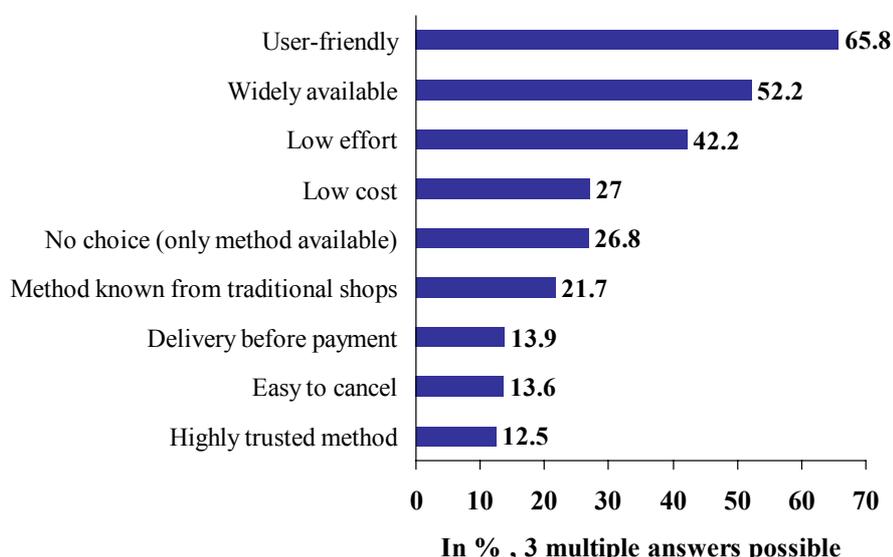
Source: International Telecommunication Union (ITU), 2004.

²⁹ Their versatile business potential has been apparent for many years. They can be used as payment instruments and/or a store of value for both remote and proximity payments, at both manned and unmanned payment terminals, and, in some initiatives, also for payments between individuals. “Smart” mobile telephones can serve as authentication and authorisation tools, store of invoices, tickets and receipts. At the same time, mobile devices can also be used as online terminals. In this respect, they are widely considered as candidates both for a flexible substitute to cards and for a cheap and locally independent alternative to payment terminals.

³⁰ According to a recent study, m-payments are already taking off in Asia, closely followed by European countries. Singapore, South Korea, Austria and Norway are already at an “advanced” state with successfully launched m-payment services; however, no country has already reached a state of market maturity. European countries such as Spain, Finland, Italy and Croatia are at an intermediary state of development. See Arthur D. Little, Global m-payment report 2004, Making m-payments a reality, July 2004.

In order to raise the interest of users and realise high potential benefits, a broad set of user requirements needs to be met. The following figure (Figure 5) shows consumers' criteria when selecting a payment method for online transactions, extracted from an online survey in Germany in 2003.³¹ User-friendliness, wide acceptance and low effort were named as the key criteria behind choosing a payment method. There is in general a start-up cost for customers wanting to use new payment instruments, for instance time spent on searching for and evaluating alternative payment instruments, on signing up and learning to use the instrument. With respect to paying for online purchases, the already established payment instruments have a starting advantage over innovative schemes because they already have a broad customer base that is familiar with the instrument.

Figure 5 Consumers' criteria for selecting a payment method for online transactions*



* This survey was based on a total of 10,604 replies. The question above was only addressed to experienced online shoppers.
Source: Institute for Economic Policy Research, May 2003.

The comparatively low relevance of **trust** for selecting a payment method sketched in the figure above might appear surprising at first, since its establishment is broadly considered as an important precondition for creating demand for new e-payment systems. One explanation for this (beyond individual preference and risk profiles) could be related to the familiarity of the users with the system and their personal record of positive **experience**. The level of trust in a system or counterpart normally increases with the level of positive experience, as long as it is not contradicted by negative experiences

³¹ Institute for Economic Policy Research, Ergebnisse der Online-Umfrage IZV6, University of Karlsruhe, May 2003, www.iww.uni-karlsruhe.de/izv/izv.html (German).

(own or reported ones). Hence, it is not only the spread of technical equipment, communication networks and payment instruments that may be decisive, but also the history of their use.³²

Box: How developed is the e-readiness of European consumers?

The growing experience and readiness to use the new communication networks and media is reflected in a country scoring undertaken by The Economist. The model tallies scores across six categories based on a total of 30 indicators. Where possible, the variables are based on statistical data; others reflect qualitative assessments by country analysts. Each category is weighed by factors between 5 and 25% (see Table 2 with explanations below). The overall e-readiness score levels show a rather homogenous situation within western Europe.

Table 2 e-readiness rankings of European countries, 2004

2004 rank (out of 64 countries)	Country	e-readiness score (out of 10)*
1	Denmark	8.28
2	United Kingdom	8.27
3	Sweden	8.25
4	Norway	8.11
5	Finland	8.08
8 (tie)	Netherlands	8.00
10	Switzerland	7.96
13	Germany	7.83
15	Austria	7.68
16	Ireland	7.45
17	Belgium	7.41
18	France	7.34
21	Spain	7.20
23	Italy	7.05
24	Portugal	7.01
26	Estonia	6.54
27 (tie)	Greece	6.47
27 (tie)	Czech Republic	6.47
30	Hungary	6.22
31	Slovenia	6.06
34	Latvia	5.60
36	Poland	5.41
38	Lithuania	5.35
39 (tie)	Slovakia	5.33

* Categories and their weights for the overall e-readiness score: Connectivity 25%, Business environment 20%, Consumer and business adoption 20%, Legal and policy 15%, Social and cultural environment 15%, Supporting e-services 5%.
Source: Economist Intelligence Unit.³³

European consumers' increasing level of e-readiness might hence also be reflected in a number of growing online transactions, e.g. sales between private persons at shopping portals and auction

³² This observation is also consistent with the survey results quoted above, since participants without online shopping experience ranked factors of trust, control and security much higher, partly even as major obstacles for online transactions.

³³ Economist Intelligence Unit, The 2004 e-readiness rankings, 2004.

platforms, or an emerging willingness to pay for digital content.³⁴ This indicates that in areas where benefits in convenience, transparency, choice or cost savings are high, digital trading and distribution channels can become very popular.

Overall, from the consumers' (or payer's) perspective, demand for e-payments is determined by a challenging set of needs that vary according to payment culture, level of trust and concrete payment situation. The readiness to use the new technologies for transactions seems to be increasing with the intensity of usage, but the particular benefits of choosing a specific e-payment method have to be obvious, especially in areas where they are competing with traditional ways of payment initialisation.

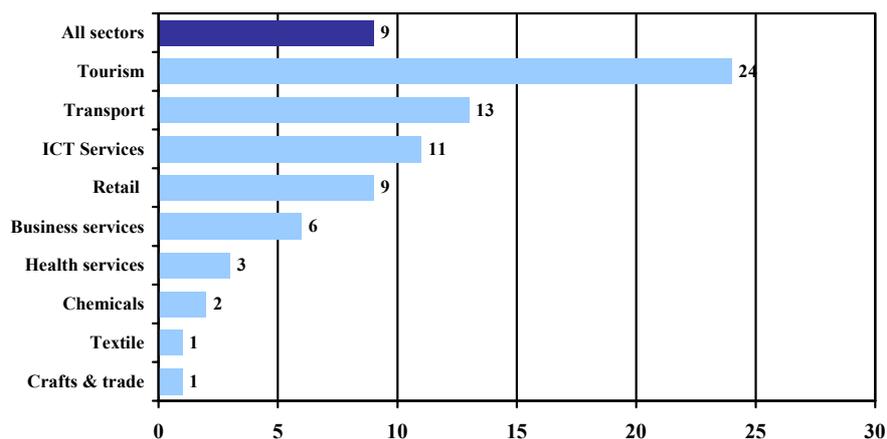
4.2 Payees (merchants)

4.2.1 Electronic commerce: online merchant's scope and payment needs

For some industries the internet has already become an important distribution channel with very high growth rates (e.g. travel, books, tickets, software – see also Figure 6 below). Traditional retailer segments along with the media (e.g. newspapers, music) and other industries have been experiencing increasing competitive challenges stemming from the new electronic distribution channels (“multi-channel pressure”).

In recent years, national retail champions in many European countries have chosen to expand their business spectrum and have started to introduce multi-channel strategies. Hence it comes as no surprise that national online shopping statistics identify high market shares concentrated on online merchants with very popular local brands that are often based on/have in parallel a physical presence as “bricks and mortar” stores.

Figure 6 Share of companies selling at least 5% of their goods and services online, according to sectors



Base: EU-5 (DE, ES, IT, FR, UK), all enterprises (N~500) by sector. Source: e-business w@tch (2004).³⁵

³⁴ According to a series of surveys by Fittkau & Maass, the share of German-speaking internet users who are in general willing to pay for online content has increased from 33.4% in spring 2001 to 56.0% in spring 2004. The share of consumers not willing to pay for content has decreased during the same period from 49.9% to 24.3%. According to the latest survey with more than 120,000 participants, 62.7% of all replying consumers “for sure” plan to buy online during the second half of 2004, 29.4% “maybe”, and only 3.8% say clearly “no” to online shopping. Fittkau & Maass, WWW-Benutzer-Analysen W3B (2001-2004).

A study for the European Commission shows whether online merchants are globally or rather nationally oriented in their offerings.³⁶ In all EU countries relatively little digital content from other EU countries seems to be used: on average, only 10% of all websites viewed originate in other European countries. The rest are either national or US offerings. There are exceptions, with a higher cross-border content interchange between countries that are culturally and linguistically close, or within communities with shared specific interests. However, some e-business sectors might have a “natural” tendency towards being regional, especially if cultural and language properties are intrinsic features of the products and services offered, and if local markets produce enough demand (this does not apply to specialised, small niche businesses that often have a globally distributed, but small, customer base). In any case, cultural factors and the distribution of the customer base will also have an impact on the payment methods offered and accepted by the merchants.

As most online merchants have a national business focus, they will also give less priority to the international usability of the payment services they accept. Instead, they seem to rely mainly on the following criteria when **selecting payment products**: facilities for minimising payment losses (risk management), high security against attacks, broad customer acceptance of the systems, high service level and availability, low transaction costs, and strengthening customer loyalty.³⁷

Merchants are now being offered increasingly versatile and integrated payment solutions. They provide not only single payment schemes, but also commonly a set of different payment options. For each single transaction, the merchant can define rules or directly select the payment methods it wants to offer to the customer (e.g. depending on the relationship to the customer, available identification methods, payment amount, delivery cost and risk).

4.2.2 Traditional retailers and e-payments at the point of sale

Flexible e-payment solutions are not only interesting for online merchants, but can equally contribute to higher security and efficiency at physical points of sale. Here, the set of payment options offered to the customers may be even more diverse, and all options have to compete with cash. The latter means of payment is especially popular for face-to-face retail payments within the common currency area, since virtually all customers/payers already possess it.

Innovative trends are also emerging at traditional shops.

- Some retailers take their obligation to accept cash combined with their already existing infrastructures for card payments as a starting point for offering a broader set of payment-related services (e.g. providing cash back at the till as an alternative to ATM withdrawals).

³⁵ www.ebusiness-watch.org/images/stories/space/reports/Pocketbook-2004.pdf

³⁶ See for example a study on e-content on behalf of the European Commission, available at ftp://ftp.cordis.lu/pub/econtent/docs/executive_summary_content_indicators2.pdf

³⁷ See for example a survey by the Institute for Economic Policy Research, Internet payment systems from the merchants' view, Ergebnisse der Online-Umfrage IZH1, University of Karlsruhe, July 2002, www.iww.uni-karlsruhe.de/izv/izh.html

- Some want to speed up the payment time at the till and enhance customer convenience by the introduction of unstaffed terminals for self-checkouts, where the customer has to scan all bought items himself/herself and then pay by card or cash.
- Where the regulatory environment allows this, some retailers offer an even broader set of retail banking services (e.g. the joint venture between the British retailer Tesco and a commercial bank³⁸).
- A broad migration to chip-based technologies is taking place in the context of the rollout of EMV, an international industry standard for debit and credit cards promoted by MasterCard and Visa.³⁹ The new standard is not only being introduced at retailers' stores, but the new generation of smart cards can also be used for online transactions (payments, signatures), if combined with a card reader on the consumer's side (e.g. personal computer, mobile device).
- At the same time, mobile and wireless technologies may lead to new shopping concepts, e.g. in the forms of terminals or radio frequency-based tags on products offered.

As a general observation, online merchants might benefit from technical enhancements at physical points of sale (e.g. if the introduction of EMV proves successful and its use can be expanded). At the same time, internet and mobile payment solutions might also contribute to a higher degree of flexibility of payment options at physical points of sale, for example if they make use of the increasingly widespread wireless telecommunication.⁴⁰ As a result, processing and security features of online and offline payments could be becoming progressively more similar, and in some cases might even be merging.

Overall, the merchants with a predominantly national customer base are also locally oriented in the payment methods they accept. It is not just new payment services that are being developed for e-commerce platforms: retailers with physical points of sale are also testing innovative technical solutions, and might start offering more payment-related services themselves.

³⁸ Tesco Personal Finance Limited is a joint venture between The Royal Bank of Scotland and Tesco UK. It offers consumer credits, mortgages, credit cards, savings products and insurance. See www.tescofinance.com/personal/finance/

³⁹ EMV is an acronym based on the initials of a consortium of three companies – Europay International, MasterCard International and Visa International – which founded a joint working group in 1994 to promote a global standard for electronic financial transactions. Today, EMV also refers to the technical specifications adopted by MasterCard and Visa to ensure the global interoperability of chip cards, chip terminals, financial messages and related services.

⁴⁰ According to a study by Forrester, the transformation of isolated point-of-sale systems into multipurpose point-of-service systems has already started. They observe that many retailers have undergone or plan POS upgrades of hardware or software, including large groups (roughly 30% of interviewed for each category) with plans to upgrade headquarters-to-store connectivity or to go wireless in their stores within two years. See Kate Delhagen, The retail point-of-sale transformation, Forrester Market Overview, March 2004.

5. E-payments without frontiers? Challenges for a mature and integrated market

This chapter contains a discussion of some basic issues and the current practical challenges facing e-payment markets. Fundamental economic questions are related to the balancing of interest in two-sided markets, to cooperation and competition between banks and non-banks, to pricing and cost of different payment products. Practical issues concern security challenges and technical solutions, and prospects for long-term e-payment market integration.

5.1 Balancing interests between provider, payer and payee

The investments needed to develop and offer new e-payment services can be lower than those for traditional, already existing infrastructures – provided the new schemes can be based on popular communication channels (with appropriate security mechanisms) and be interlinked with the accounts of as many users as possible. However, only very few innovative e-payment schemes have so far succeeded in winning a customer base above the point of critical mass.

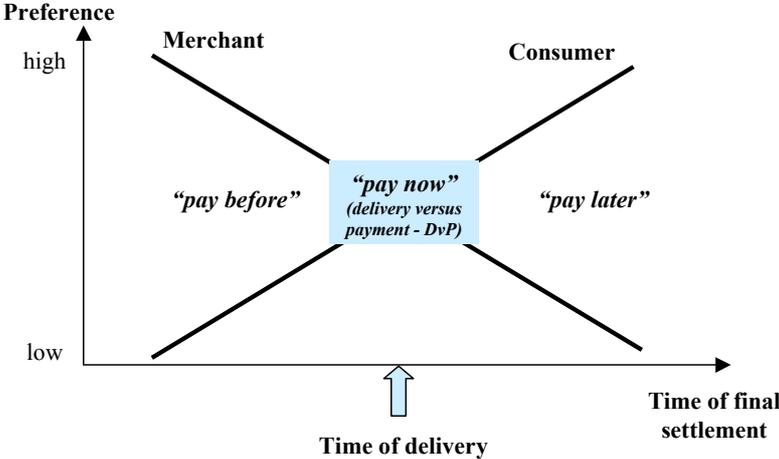
Following the concept of two-sided markets (see the start of Chapter 4), one major challenge for e-payment service providers is to combine their own business case with consumer and merchant preferences. There are areas with an overlap of interest between payer and payee, and others where interests can be very diverse, and even opposite. Furthermore, providers have to solve the so-called chicken and egg problem, whereby merchant acceptance depends on customer acceptance, and vice versa.

The preferences of merchants and customers when choosing which payment options to offer (the merchant) or to select (the customer) usually differ, except that both expect the payment to be secure and available at low cost. The definition of “secure” might mean different things to both parties, and also depends on the concrete payment situation (e.g. on distribution of rights and liabilities, available options for identity verification). The cost structure for a payment service might also differ greatly for consumers and merchants (on cost/pricing issues and security aspects, see also Sections 5.3 and 5.4 of this chapter). The consumers’ demand for ease of use will often favour well-known, existing payment instruments, and the merchants’ wish for a broad customer base might also push in the same direction. Together, these preferences could function as a fairly strong obstacle for new e-payment services seeking to gain a footing in the market.

There are typical patterns that can be found in the remote retail business (i.e. e-commerce, mail and telephone order) if both parties have not yet established a relationship of trust. The higher the transaction value is, the more disparate the preferences become regarding the relative timing of payment and delivery (in Figure 7 below, this can be illustrated by “steeper” inclining preference curves). This is related to opportunity costs and fulfilment risk, i.e. factors that both sides usually try to keep low. High payment amounts therefore create a high need for synchronisation of delivery and

final settlement (no opportunity costs), or for the services of a trusted third party⁴¹ on both sides (reducing counterpart fulfilment risks).

Figure 7 Matching timing preferences for payers and payees



One of the most fundamental conflicts of interest in trade is the timing of the payment compared with the delivery of the goods. Whenever two trade partners do not know and trust each other – which is a common situation on the internet, for example – neither wants to give out his or her asset to the counterpart without getting the agreed asset in return at the same time. In the case of point of sale trades or in other cases when both parties are present, synchronising both transaction legs is relatively easy. The goods are transferred either in direct exchange with cash or with the help of instruments that initiate and authorise the payment process (the settlement of the amount can be checked and guaranteed in most solutions). Trade procedures in which the transfer of property takes place if, and only if, the according payment occurs, are a well-established concept in the securities industry and are called **Delivery versus Payment (DvP)**.⁴²

DvP-like concepts are not easily achieved in distance trading, and especially not if physical goods need to be shipped to the buyer. Payees and payers have to agree on the timing and confirmation procedures for both delivery and payment. The basic conflict of interest is closely related to the risk/value of the underlying transaction and the relationship between both parties (available information and trust). E-payments can offer solutions especially tailored for e-commerce transactions and remote payments, making use of various technical possibilities. For instance, high-speed

⁴¹ The consumer pays to the trusted third party (TTP), the TTP notifies the merchant who then delivers the good or service, and the TTP releases the funds to the merchant as soon as the consumer has acknowledged delivery.

⁴² Such mechanisms similarly occur in the field of foreign exchange settlement transactions: “Payment versus Payment” (PvP) rules ensure that a final transfer of one currency occurs only if a final transfer of the other currency or currencies also takes place.

transaction processing and settlement can be offered for digital goods (“real-time” transfer of values) that allow exact synchronisation with the time of delivery.

The discussion so far has been restricted to conflicting interests between three parties (payer, payee and provider). However, real e-payment services are much more complex. There is for instance normally not just one single payment service provider: instead, the roles for acquiring merchants/potential payees and distributing services to consumers/payers are usually split. Similarly, the functioning and coordination of communication, transaction and delivery channels, and of shopping, payment and reconciliation platforms, involve a large variety of additional counterparts in the transaction processes. Hence the cost-benefit distribution (including the distribution of related risks) between all parties involved in a scheme often becomes one of the most fundamental and complex issues that need to be addressed in an e-payment business model.

5.2 “Co-opetition” in e-payment networks

“Co-opetition” describes a market situation in which cooperation and competition exist in parallel. It is a typical feature of network industries.⁴³

In the last decade a plethora of e-payment schemes have been introduced and withdrawn. Many different industries have tried to establish e-payment solutions on the basis of their existing core business. The banking industry has spent billions of euro on developing innovative online payment solutions, many of which have not survived. Currently, new schemes are mostly being introduced by non-banks (e.g. mobile operators, retailers, internet providers). They often approach the payments market with a different attitude and competitive strengths (e.g. network expertise or, since they are not starting from a defending position like banks, fewer conflicts of interest between different payment solutions already offered). However, they also face a lack of experience in critical business fields such as customer and merchant scoring (high loss risks). Furthermore, they have to find flexible ways and invest money in linking their schemes to existing payment infrastructures, enabling their users to transfer means of payment to their systems and back to bank or card accounts, etc. This set-up implies that new competitors need partners in the banking sector. A jointly beneficial sharing of roles among industries could be encouraged in this context. There are many opportunities to build on complementary core competencies of banks and non-banks along the e-payment value chain.

However, even for strong alliances across business sectors, many **obstacles** remain that help explain why so many innovative e-payment systems have difficulties or fail. E-payments share all the traditional problems of any payments industry segment, principally network externalities, switching

⁴³ The term “co-opetition” was coined by Ray Noorda, the founder of the software company Novell. It is based on games theory, and refers to a business strategy based on a combination of cooperation and competition, derived from an understanding that business competitors can benefit from working together in some areas. The basic co-opetition model has four players: customers, suppliers, competitors and “complementors”. Complementors are players whose product adds value to own products, while competitors are players whose product makes own products less valued. See SearchCIO.com definitions, available at http://searchcio.techtarget.com/sDefinition/0,,sid19_gci348622,00.html.

costs and the need for standards. E-payments are especially dependent upon established bank infrastructures, since most schemes are built on the settlement backbone of basic payment instruments. At the same time, joint ventures are hard to manage. Their main issues are complexity and understanding of combined business areas (different languages), challenges of technological coordination (interoperability and standards), and the distribution of cost, risk and revenue among partners and value chains (see also the description of challenges to establish cost-based pricing in Section 5.3). E-payments must also deal with the rapid development of technical possibilities and vulnerabilities, requiring permanent adjustments to be made to business strategies and security measures (see also Section 5.4 on security). Although there is the potential for international reach, existing national regulations, payment structures and habits dictate the rules. However, the regulatory environment is also changing. Pan-European harmonisation and the set-up of sustainable and technologically neutral frameworks are the major challenges facing regulators (see also Chapter 6). Cooperation is needed in order to obtain interoperability and standards. **Standards** are decisive drivers of cost-efficiency and broad usage (critical mass). They are being developed at different levels, e.g. between network platforms, for messaging systems, for payment instruments at a pan-European level, for electronic signatures in public-private initiatives, or as security features at international levels. Standards are also needed for the regulatory environment in order to ensure a level playing-field in the EU. Currency differences, which represented one important obstacle for interoperable and efficient payment infrastructures, have already disappeared, at least within the euro area, but partly also for EU-wide payment transactions in euro. This gives the Member States and especially the euro area countries an excellent chance to set the pace and direction in market integration.

However, with respect to market maturity, there is no simple answer to the question of when is the right time to promote the development or adoption of standards. Related questions are: Should standards be set before the market has reached a higher maturity, or only afterwards? To what extent are standards needed, as long as new systems are built on existing banking infrastructure? Furthermore, the successful establishment of standards requires the enforcement of their use. Some of the public authorities may play an important role in this respect, either as a facilitator, important user or regulator of common standards (see the example of public-private partnerships for electronic signatures in Section 5.4). However, it is similarly difficult for public authorities to establish clear guidance on how far or how fast convergence, interoperability and standard setting should go. For e-payments, there seems to be a high probability that regional differences in the payments culture and habits might prevail, at least until new generations of users with a higher state of “e-readiness” have emerged.

5.3 Pricing, cost and efficiency

A number of recently published studies aim to analyse the costs of electronic and non-electronic payment transactions.⁴⁴ Some claim that a country can substantially reduce the costs of retail payment services by making the transition to fully electronic payments. In order to realise cost savings, an explicitly cost-related pricing of payment services would need to be introduced. However, it is not easy to quantify these gains and, owing to different methods of cost calculation⁴⁵, the final results of such studies on retail payment costs are not very comparable. Nevertheless, indicators on the cost per transaction from some studies are summarised below (Table 3).

Table 3 Bank, retailer and social cost per payment transaction

Country	Year	Denomination	Cheque	Paper-based giro	Electronic giro/ACH	Credit card	Debit card	Cash
Bank payment costs								
Norway	2001	EUR	3.08	1.03-3.35	0.62-1.09	-	0.34	-
Spain	2001	EUR	0.27	-	0.08	-	0.07	-
US ¹	1993	USD	0.15-0.43	-	0.12-0.44	-	-	-
Retailer payment costs								
Germany	1999	EUR	0.50-0.71	-	0.68	-	0.87	0.09-0.15
Netherlands	2000	EUR	-	-	-	3.40	0.27	0.15
Sweden	2001	EUR	-	-	-	1.54	0.23	-
US	2000	USD	0.36	-	0.24 ²	0.72 ³	0.34 ⁴	0.12
US	1993	USD	1.25	-	0.23	-	-	-
Social costs								
US	1993	USD	2.78-3.09 ⁵	-	1.15-1.47	-	-	-
Netherlands	2002	EUR	-	-	-	3.587	0.486	0.3

Sources: De Nederlandsche Bank, 2004; Gresvik et al., 2003; Humphrey et al., 2003b (EUR 1 = USD 1.027).

¹In the US study based on figures from 1993, the bank and the retailer payment costs contain only the processing costs, while the social costs contain also the production costs. ²Electronic Benefit Transfer, similar to electronic giro payment. ³Covers both credit cards and off-line debit cards. ⁴On-line debit cards. ⁵Excludes float benefit of USD 0.09 per cheque.

According to the studies on retailer payment costs quoted in Table 3, cash still shows the strongest (average) cost-efficiency position, even against its main competitors debit and credit cards. Cheques seem to be the least efficient payment instrument, more costly to all parties than credit transfers (giros), while paper-based giros are less efficient than electronic ones. When comparing costs of alternative payment products, it has to be considered that the costs per unit are strongly determined by their stage in the life cycle. Electronic payments that are at an early stage with high development

⁴⁴ A list of articles on the cost, pricing and efficiency of retail payments can be found in the annex.

⁴⁵ Some cost studies are based on cost data collected directly from the market, while others estimate the operating costs from measurable output characteristics of the banking sector (e.g. number of transactions processed, of ATMs or of size-adjusted branches). They aim at calculating either costs for banks, or for retailers or the overall total costs to society (social costs). Papers can also use different cost categories (average or marginal cost indicators). Moreover, there can be differences in the instruments covered by these studies.

(fixed) costs and low numbers of transactions have comparatively high average costs.⁴⁶ The opposite applies to cash, which has a very long history of successful usage. Cash has a very strong market position that is protected by its already installed base. The bias caused by high fixed costs can be avoided if *marginal costs*⁴⁷ are compared, according to Norwegian and Dutch studies.⁴⁸ In the case of the Netherlands, according to marginal costs the electronic prepaid card was identified to be the most (societal) cost-efficient payment product, even irrespective of the amount transferred.⁴⁹

The most relevant question for central banks and other public authorities is whether efficiency can be fostered by attempting proactively to speed up and reinforce the transitional process to electronic means of payment and payment instruments. Such an active public approach may incur fundamental changes in the rules and conditions of central bank money circulation as well as for own payment systems and services. A question directly connected to this is whether the relative prices of different payment alternatives should be set in a way that takes cost factors into account. The ability to exploit hidden gains by cost-based pricing depends not only on the provider's intention to change its pricing strategy, but also on customers' responsiveness to such price variation. If consumers have additional significant preference factors apart from the fees they have to pay, the intended migration to more efficient schemes might not happen. However, at least the provider has better compensation for offering less efficient services.

In spite of the partly uncertain theoretical background, there are some countries where consensus on the necessity of more cost-driven pricing policies⁵⁰ has been obtained. Cross-subsidisation⁵⁰ has been more or less eliminated in Sweden and Norway, for example. Consumers have responded to price variation by increasing their usage of electronic payment instruments. Consequently, the electrification process is already far advanced in these countries.⁵¹

⁴⁶ A higher transaction volume could result in a radical decrease in average cost (*economies of scale*).

⁴⁷ Marginal cost is the additional cost that a company incurs when producing one more unit.

⁴⁸ De Nederlandsche Bank, 2004; Gresvik et al., 2003.

⁴⁹ This result is related to the fact that apart from the volume and the size, other differences in payment transactions could not be taken into account. Quality or preference-driven criteria are hard to measure. However, preferences-related factors may be especially decisive for pre-funded payment schemes. See also aspects from Section 5.1 on diverging interests regarding the timing of payment relative to delivery, which indicates a general tendency on the part of the consumer against choosing prepaid payments, especially for large amounts.

⁵⁰ Cross-subsidisation means that price structures are unequally distributed between different user groups or products.

⁵¹ Consumer organisations might not be in favour of direct pricing, while service providers are afraid of losing customers ("cream-skimming" by competitors) if they are the first to move (Van Hove, 2004).

5.4 Security and risk in e-payments⁵²

Payment security is a multilateral issue that has to be negotiated between all partners along the clearing and settlement chains. It has various aspects – technical, business, legal and also socio-psychological. The threats faced vary with the profile and creativity of the attacker, who normally searches for “weak spots”.

However, an e-payment system offering 100% security is impossible – or at least, unaffordable. The more complex a scheme is, the more costly and difficult it is to keep it secure. Users and processors must understand, accept and apply security procedures (relevance of “human behaviour”). Allocating acceptable distributions of risk/liabilities and also of costs for protection and prevention measures between stakeholders is difficult.

5.4.1 Examples of current security challenges facing e-payments

Trust in retail payments is currently being challenged by an ever increasing number of cases of *identity theft* in more and more countries worldwide. Identity theft can be defined as the misuse of personal data or documents in order to impersonate another individual to commit illicit activities, e.g. to abuse the victim’s banking facilities or other assets. E-payment schemes can also be affected by this phenomenon. Such cases are very common in the United States (with more than 1 million cases reported, and very high growth rates), Canada, Australia and South Africa. In the EU, the problem is most prominent in the United Kingdom, whereas other countries seem to be (so far) less affected. However, very little data is available on such cases. Especially affected are popular transaction types such as card transactions at automated teller machines (ATMs), online banking transactions or the use of credit card numbers for internet payments.

Attackers use fraudulent e-mails and internet sites to lure consumers into revealing personal and/or financial information. This type of attack is called *phishing*. The most important defence against this kind of attack is well-informed and sceptical users of the systems who use computer systems with updated security patches.

Another popular form of attacks is the unnoticed duplication of electronic data from a payment card (*skimming*). A small device is installed in front of the original card slot of an ATM, ready to copy the information from the magnetic stripe on a card inserted by an unsuspecting customer. Other methods include a camera, a secret observer or an invisible, fake touch pad to try to duplicate the keystrokes used to enter the password. With this combined information, thieves can easily create duplicate cards and withdraw money from the accounts in question. Instances of skimming can also occur at cash registers, e.g. by making payments at manipulated card terminals. The risk of such incidents can be reduced by increasing customer awareness, but even more effectively by technical security

⁵² Detailed information on the prevention of fraud and counterfeiting of non-cash payments and organised financial crime, including a study on the security of e-payments published by the Commission in September 2003, are available at http://europa.eu.int/comm/internal_market/payments/fraud/index_en.htm#preven. For a discussion on the risks of online transactions, see also Z. Jakubowicz, B. Hanssens and S. Henriksen, Is paying on the internet risky?, ePSO Discussion starter No 2, September 2003, www.e-pso.info

improvements – inter alia by the broad migration to chip cards that allow more sophisticated protection (e.g. against duplication) than cards with just a magnetic stripe.

Thieves and fraudsters often focus on payment situations with a relatively low level of available information and data that can be verified. Since there is for example usually less information available when spending money abroad, *cross-border transactions* may generally incur higher risks. The relatively high number of identity fraud cases across borders may be related to different checking rules and procedures, and to a lack of knowledge as to the counterpart's identity. Attackers can make use of reduced effectiveness of transaction filters and control systems, exploit the limits of online security checks, and sometimes also rely on delays or lack of coordination in legal prosecution. For globally focused transaction infrastructures such as credit card services, the internet and mobile networks, issues of payments security and risk reduction are not only a pan-European issue, but rather a global challenge. Payment service providers are addressing this challenge by the introduction of common industry standards (such as EMV, the chip-based security standard by MasterCard and Visa) and the mutual exchange of information. There are also public initiatives, bodies and structures to fight organised crime related to payment transactions at different regional levels.⁵³

The examples above show that security issues pose varying challenges, with a permanent need for adoption of new measures and communication between users and service providers. The introduction of surprise elements and context-sensitive data in the security processes may keep the systems more flexible and robust against large-scale attacks.

From the user's point of view, potential risks often remain hidden or unclear. Some e-payment-related transactions might at first sight not incur any (or only a limited) exposure to financial loss, e.g. owing to restricted amounts stored and spent. However, indirect costs may be much higher in case of attacks. The identification and legal proving of fraudulent transactions and the cleaning of records and issuing of new identity instruments, payment cards or network accounts can take considerable time, cause trouble and also incur direct costs. Therefore it is important that individual users develop a high and permanent awareness of security issues. This involves interest in initial security configurations of new devices; in keeping passwords secret; in protecting and encrypting sensitive data locally stored and while being transmitted; or by general alertness to the fact that the identity of senders and the integrity of messages received can easily be forged. The last aspect applies in particular to mobile messages, e-mails or internet websites.⁵⁴

⁵³ On a European level these include: the EU Action Plans to prevent fraud on non-cash means of payment (2001-2003, 2004-2007) by the Commission; the widened responsibilities of Europol (since 1999), the EU's own law enforcement agency; the set-up of Eurojust, a unit of national prosecutors, magistrates and police officers (2001/2003); the Judiciary Network (EJN) (1998), providing contact points in the EU Member States to supply anti-crime professionals efficiently with information; and especially the European Forum on Organised Crime Prevention set up by the European Commission, which aims at mixing prevention and repression measures and involves external partners, the business community, researchers and civil society in general.

⁵⁴ The fast-growing popularity of new wireless transmission channels with less developed technical security features such as wireless LAN (WLAN) and Bluetooth could cause a temporary setback in the security of e-payment-related services. In some aspects (for example protection against mobile spies during online banking transactions, in combination with denial

5.4.2 Approaches for enhancing e-payment-related security and trust

The following paragraphs briefly depict some selected technical and organisational approaches designed to minimise different e-payment-related risks.

An increasing number of merchants rely on **scoring and rating schemes** to minimise losses from unpaid card transactions at the point of sale, but even more potential losses in online and distance selling. Based on their own customer data collection, as well as on external available information and rating schemes, the pattern of single transactions and data profile of customers is used as a decision support tool for selecting business transactions and acceptable ways of payment. The fewer data are available about a person and the more unusual a transaction pattern appears, the more precautions or additional manual checks the merchant will apply before accepting a deal. Such risk management solutions can significantly reduce losses related to fraud and returned payments, if implemented and run properly. This comes at the expense of setting up and calibrating the system, collecting and acquiring data, and conducting labour-intensive manual checking work. The existence of scoring and rating schemes is widely unnoticed by consumers, who might have less “ownership” and control over their personal data. They can be also affected by “discriminating” decisions based on outdated or incorrect data, e.g. owing to cases of identity fraud.

Trusted Third Parties (TTP) are an intermediary solution for the diverging interests of consumers and merchants, e.g. in cases where synchronisation of delivery and payment is not feasible and the risk perception on both market sides is significant. The TTP monitors and confirms that both counterparts have fulfilled their obligations before delivery and payment are finally and irrevocably effected. The main benefit of TTP solutions lies in the reduction of fraud, e.g. for new business relations. The fees for a TTP service do however increase transaction costs and need to be shared between all sides of the market.

On the public activities related to implementing **electronic identity systems**, which usually means the establishment of widely used **public key infrastructures** (PKI) and **electronic signatures**⁵⁵, some European countries have reported good progress. The most advanced projects exist in Estonia, Norway, Finland, Belgium, Slovenia and Italy, followed by projects in Spain, France and Austria (see also the Box below for some selected short descriptions). Such projects generally envisage a broad spectrum of usage and benefits with a high level of convenience for citizens and for the efficient provision of e-government services. It is often expected that private initiatives and applications should also be developed on the basis of the new infrastructure. This might also be interesting for offering payment-related services (e.g. if the electronic signature is used for payment authorisation or if the electronic identity card can also store e-money values). However, while centralised security structures have a high potential for economies of scale and scope, they also face specific challenges. The broader

of service attacks), the technology of new channels is lagging behind the standard security and protection features of personal computers connected to the internet via fixed lines.

⁵⁵ For a detailed description of PKI mechanisms and the functioning of electronic signatures, see the previous ECB issues paper. ECB, E-payments in Europe – the Eurosystem’s perspective, September 2002.

their spectrum of use for authentication of citizens and authorisation of (financial and other) transactions becomes, the higher are the incentives for forgery, theft and other forms of attacks.

Box: A review of public electronic identity projects in selected European countries⁵⁶

Estonia is the most advanced country, with some 650,000 national identity cards issued for a population of 1.4 million since 2002. The electronic ID card is mandatory for all Estonian residents. It is the main domestic identification document. Electronic signatures were introduced in 2003. The “Starter Kit” for persons who want to acquire the electronic ID card is available at a low price at many retail stores. The new services for citizens include online access to personal civil data, vehicle registration services, and electronic signatures for tax declarations. Local and private applications of the system include among others ticketing systems and electronic prescriptions in the medical sector.

By May 2004, the Population Register Centre in **Finland** had issued around 40,000 electronic identity cards with citizen certificates. Multi-application cards have been launched that allow access to services provided by governmental authorities, municipalities, banks, insurance companies, stores and other service providers in the private sector. The citizen certificate is also being implemented into pre-funded cards (Visa Electron), and a mobile certificate version is planned to follow.

In **Belgium**, the government conducted a pilot programme in 2003 with electronic identity cards issued to civil servants in eleven municipalities. The Ministry of Internal Affairs is the only certification authority. A private company authorised by the Ministry distributes the cards. Starting in 2004, the cards are to be introduced nationwide to all citizens, with the intention to replace all 10 million paper-based identity cards with electronic ones within five years. The card costs 10 euro, and is valid for five years. As of May 2004, some 56,000 cards had been issued.

Italy tried out a pilot phase of a national electronic identity project involving 83 out of a total of 8,102 national municipalities. In this phase, 100,000 electronic identity cards were issued to citizens. Between 2005 and 2009, electronic identity cards are planned to be introduced in all municipalities in Italy. The card can already be used at national level for citizen identification at polls and for checking fiscal positions, and at local level for school enrolment and payment of fees, as well as change of residence. Several services are being prepared at both national and local levels.

An increasing number of public services are also available electronically in **Germany**. The federal e-government project aims to make all appropriate administrative services available online by the end of 2008. This raises the questions of suitable identification, authorisation and payment procedures. The payment aspects were covered in a comprehensive analysis in 2004.⁵⁷ Work on electronic signatures is carried out by the Signature Alliance, a public-private initiative that is developing interoperability concepts and financing models.

⁵⁶ Source: Porvoo Group, 2004, www.electronic-identity.org. The Porvoo Group was established in the city of Porvoo, Finland, in 2002 during a conference held in conjunction with a public identity project (Smart Card Charter) under the eEurope programme. It consists of governmental representatives of a growing number of European countries (and also includes representatives from the private sector and the European Commission).

⁵⁷ E-government Manual, Module in sub-chapter IV B., “Secure payment procedures for e-government”, ibi Research, University of Regensburg. See http://www.bsi.bund.de/fachthem/egov/6_en.htm

Electronic identity projects by public authorities with broad scope of use for citizens are mostly still at an initial stage, and so is their potential use for or integration into electronic payment services. At the same time electronic identification may become a business area for established e-payment service providers. The latter can already be observed in some countries. Some banks have opened their customer identification systems for use by other e-commerce platforms and services. For instance, the Danish Bankers' Association offers secure personal identification based on their security system for internet banking.⁵⁸ In Finland and Estonia e-banking identities can be used for many different purposes, including e-government transactions.⁵⁹

Tools for prosecutors are also being developed, for instance in a project by the European Commission's Joint Research Centre (JRC) called EU Cyber Tools On-Line Search for Evidence (CTOSE). EU researchers together with European computer and security specialists are working on standardised procedures to identify, secure, integrate and present electronic evidence on online criminal offences that will stand up in court or tribunal proceedings throughout Europe.⁶⁰

RFID (Radio-frequency identification) can be used to track and tag goods, e.g. all articles being transported to or situated in stores. Its potential benefits for merchants are the enhanced possibility of preventing theft, but also of allowing automated, contactless billing and checkouts (billing by passing through a gate and paying by waving a contactless card in front of a reader, for example). However, the initial investments in technical equipment and processes are high, while acceptance on the part of consumers remains uncertain.

5.4.3 Other policy aspects of e-payments related to security

Security issues in e-payments may also matter for public authorities from a **trust and stability perspective**. A perceived or real lack of security of specific instruments, systems or means of payment may lead to a loss of confidence and consequently a user boycott. If there are market niches and payment situations where no alternative payment options are available, due to a monopolistic market situation, the loss of confidence can block all the trading transactions. However, if alternatives exist, users might be unwilling to revert to schemes that look very similar or are closely connected to the initial service that has already lost their confidence (spillover effects). Central banks address such systemic issues in their oversight policy (see also Chapter 6).

Privacy issues: The collection, exchange, combination and analysis of data for risk management purposes also leads to the availability of increasingly refined individual user profiles. This implies a great responsibility to keep these personal data well protected. There might be incentives to use

⁵⁸ PBS news and press releases, Electronic ID via the bank, June 2004. See http://www.pbs.dk/pbs/site/pbs_dk/en/content/om_pbs/nyheder/nyhed_040601.html

⁵⁹ In Finland the around 40,000 electronic identity cards compare to approximately 3.5 million digital identities used by online banking customers. According to figures provided by the Estonian branch of Nordea bank, roughly 750,000 Estonian citizens use internet banking. Nordea Estonia reports that, by March 2004, 261,000 Estonians had used e-banking identification to make their digital tax declarations, while only around 400 citizens used the certificate-based identity card.

customer or payment transaction-related data outside the initial business context, or sell them to interested third parties. As far as this would seriously affect the rights of individuals (e.g. lead to discrimination in other business sectors), such practices are contained by legal provisions for privacy.

Protection of minors: Some e-payment services offer the option to differentiate between users with certain characteristics, especially according to age groups. Such features enable access restrictions to certain offers and the checking of additional attributes/conditions while paying. For instance, the e-money chip card system GeldKarte in Germany has committed itself to introducing age-sensitive cards. This new feature could for example be used to prevent young people below the age of 16 from buying cigarettes at open-door vending machines, which is enforced by the German government by end of 2006. It could also be used for paying adult content on the internet or via mobile phones. Similarly, the Austrian paysafecard, a pre-funded scratch card, issues two types of cards, for adults and minors, in order to restrict the access of young people to adult content on the internet. The protection benefits of such additional features can be high, but only if the age check is reliable (especially at the time of issuance), and if minors do not have access to unrestricted alternatives (e.g. from 2007 onwards, public cigarette machines in Germany will no longer accept cash payments).

5.5 Prospects for a “domestic” e-payments market in the SEPA

In the EU there is still, to a large extent, fragmentation between national and cross-border payment markets. This especially affects retail payments within the single currency area. The long-term elimination of such border effects is a defined goal of the European authorities. In close cooperation with the banking and payments industries, they want to create an **integrated payments market** within Europe. In more detail:

- The European Commission wants to bring about a single payments area in the EU.⁶¹
- The ECB and the 12 national central banks of the euro area countries are especially interested in promoting progressive market integration within the common currency area. The Eurosystem has oversight responsibility over euro area payment systems and operates a common real-time gross settlement system (TARGET).
- The European Payments Council (EPC) is a pan-European banking body that aims at bringing about SEPA, the Single Euro Payments Area, by 2010. It sets the speed of progress in this direction and is the place where European banks make common decisions, e.g. on standards (on the latter, it builds upon the work of the European Committee for Banking Standards (ECBS)).

⁶⁰ See <http://cybersecurity.jrc.it>

⁶¹ See for example the European Commission’s Communication on “New Legal Framework for Payments”, 2003, available at www.europa.eu.int/eur-lex/en/com/cnc/2003/com2003_0718en01.pdf

- The EBA Clearing, a separate entity of the European Banking Association (EBA), is the operator of two important European clearing and settlement platforms (STEP2 and EURO1) and therefore an important executor of the banks' pan-European strategy.

In the retail payments area, transformation will have to take place from quite divergent starting points. The high charges for cross-border payments compared with national payments were one of the most obvious discrepancies regarding the existence of a true common payments area from the consumers' perspective. In December 2001, the European Parliament and the EU Council adopted a Regulation⁶² on cross-border payments in euro obliging payment service providers to charge equal fees for national and cross-border payments. Since this rule also applies to e-payments, it might pose an additional challenge to new schemes with pan-European ambitions (see also Section 6.1).

According to the ePSO survey results conducted by the Eurosystem, the market for innovative retail payments continues to be very dynamic. However, most services are still at an early stage of development and/or have a very **limited customer base**. Some schemes have closed down after the pilot phase or after a few years of operation. Among a set of 170 schemes assessed, the share of e-payment and related services that are offered to customers in more than one EU country is still limited (20% of schemes included in the survey). Where services are available cross-border, this is mostly the case in regional clusters with a common language and cultural background, or can be found in connection with credit card-based services.

The euro already plays a central role as a European e-payment **currency**. More than 80% of the e-payment services included in the survey offer denomination in euro. Even most of the providers outside the euro area (13 out of 25 EU countries) offer payments in euro: only 24% of their schemes are restricted to their home currency. E-payment providers aiming at worldwide use of their schemes for e-commerce transactions normally offer their services in all major currencies.

More than half of the system providers state that their services are open for **cross-border use**. In connection with a predominantly national customer base discussed above, this rather indicates that services are **accessible from abroad** (e.g. via the internet or roaming in mobile networks), and not so much that the schemes can be used for payment transfers between a payer and payee of different country origin.

To sum up, many services in the field of e-payments seem to be (still) restricted by national borders, despite their use of border-less communication technology and the growing popularity of the euro as a common currency. Nevertheless, they also seem to be ahead of the overall integration of the retail payment market.

It remains unclear what role innovative electronic payments will play in 2010 for "domestic" euro payments in the SEPA. If they continue basically to rely on the existing payment infrastructure and the banking networks, they cannot be expected to provide any better (or worse) pan-European solutions

⁶² EC/2560/2001 requires banks and e-payment service providers (including card schemes) to apply the same charges as for national payments for cross-border payments in euro up to EUR 12,500.

than those offered by the banks and cards industry. They could, however, make such traditional services more widely available, convenient and flexible to use. This might also help to increase market efficiency and enlarge the set of available options for facilitating cross-border transactions.

6. Regulatory framework

Innovative schemes offer new ways to use basic payment instruments and to access traditional and new means of payment, attempting to provide more convenience and choice in payment services. However, the prospect that at least some of these new services could be widely used, as well as the obstacles providers might face when offering their services across Europe, raise some policy questions. This chapter provides a short overview of important regulators, highlighting selected issues and developments in the regulatory environment with relevance to e-payments. In a second section, the Eurosystem's role and activities in this area are briefly outlined.

E-payment schemes have to respect a wide set of laws, rules and other regulations. The regulatory framework for electronic payments consists of rules and legislation partly set at the European level, and partly (and in a more detailed fashion) at national level.⁶³ Some of its main elements include rules on money laundering, supervision of commercial banks and e-money institutions by supervisory authorities, payment system oversight by central banks, consumer and data protection, cooperation and competition issues, as well as legal provisions and support for initiatives in the areas of e-government and e-commerce.

Box: Public authorities with an interest in e-payments

Stable and trusted payment services are regarded as being of crucial importance for the development of a stable economy. Besides the European Commission and government bodies (e.g. ministries of finance) and central banks (see next section), three other main groups of authorities may be active in setting the regulatory framework of payment systems in general and of e-payment business in particular: prudential supervisors, competition authorities and consumer protection authorities.

Prudential supervisors primarily address risks related to individual credit institutions (i.e. commercial banks and electronic money institutions in the EU). Commercial banks take deposits, grant credits and support the payment system. E-money institutions have the legal permission to provide electronic means of payment. Banking supervisors are in charge of ensuring the legality of such bank and ELMI operations and of assessing the credit institutions' ability to manage their business risks. Supervisors are authorised to take measures in cases of irregularities or non-compliance with banking laws and regulations. Their activities include licensing, monitoring, issuing principles and general instructions, and if necessary, closing of institutions. In many countries, the supervisory functions of banking, insurance and the securities business have been merged under the roof of one authority, owing to close interrelations between these areas of financial services.

⁶³ A list of references on e-payments-related rules and regulations can be found in the annex.

Competition authorities watch over the proper functioning of market mechanisms with respect to pricing, entry barriers and level playing-fields. They typically do this for all segments of the market, including payment services. Through antitrust measures, they ensure that markets remain contestable. In some cases, however, they may tolerate exceptions. In payment systems, competition authorities typically accept some forms of interbank cooperation, for example in the fields of standards and infrastructure.

Consumer protection authorities are also active in the field of financial services. They may, for example, check that cost, fees and processing times are not set by the payments industry to the detriment of consumers.

6.1 Current issues in the regulatory framework for e-payments

6.1.1 Regulation on cross-border payments in euro

European Parliament and Council Regulation (EC) No 2560/2001 on cross-border payments in euro⁶⁴ obliges banks and other electronic payment service providers to align fees for cross-border electronic transactions in euro to the levels of national fees within a Member State. This obligation affects cross-border cash withdrawals, card payments and other electronic payment transactions (since 2002) and cross-border credit transfers (since 2003), currently up to a maximum amount of EUR 12,500. It also applies to innovative e-payment services facilitating cross-border funds transfers in euro within the EU. Hence, all e-payment providers offering payment services in euro with payers and payees that can be situated in different EU countries have to ensure pricing structures according to the Regulation.

6.1.2 Interpretation and implementation of the E-money Directive

According to the E-money Directive, the issuance of e-money in the EU is limited to traditional credit institutions and to a new type of supervised undertaking called e-money institutions (ELMI).⁶⁵ Providers of pre-funded payment solutions offering services as covered in the Directive are subject to supervision from the prudential supervisors, if they are not being waived. Under the Directive, electronic money must be for example redeemable against central or commercial bank money at par value, and its issuers are required to meet capital and investment requirements and to implement safeguards against money laundering. The E-money Directive has been transposed into national laws⁶⁶; however, the national interpretation differs widely in several respects (see the Box below). This could partly be explained by different legal starting conditions when incorporating the ELMI Directive into already existing legal frameworks. From a European perspective, the differing legal

⁶⁴ See http://europa.eu.int/eur-lex/pri/en/oj/dat/2001/l_344/l_34420011228en00130016.pdf

⁶⁵ The common framework consists of two European Parliament and Council directives: first Directive 2000/46/EC on the taking up, pursuit and prudential supervision of the business of electronic money institutions (E-money Directive), and second Directive 2000/28/EC amending Directive 2000/12/EC relating to the taking up and pursuit of the business of credit institutions (Bank Directive).

⁶⁶ The transposition is still in progress in some of the ten new Member States.

interpretations and implementations of criteria according to which an undertaking is to be regulated as an ELMI and the different implementation of the waiver contained in the Directive have led to a rather confusing situation.

Box: E-money implementation⁶⁷

In some countries e-money **institutions** are defined as a subcategory of credit institutions (Austria, Germany, the Netherlands, Spain and Portugal). A second group of countries regards them rather as licensed payment service providers issuing payments instruments in the form of e-money (Ireland, Denmark, Sweden and the United Kingdom). In some countries waivers have been introduced; in others this option has not been implemented.

The **definitions** of e-money in local regulations and supervisory approaches vary considerably as well. Some countries have specified maximum amounts of e-money that may be stored on an electronic device. In some national laws specific clauses confirm that the funds that e-money issuers receive from the public in exchange for e-money values do not constitute a deposit. In other countries, however, e-money has been interpreted so widely that hardly any criteria for a consistent differentiation remain, especially in the context of the different definitions of ELMIs partly as credit institutions, partly as service providers.

The European Commission is aware of these differences in the implementation of the Directive.⁶⁸ It is addressing the specific controversy on the application of the Directive to prepaid payment services provided by mobile operators. In May 2004 the Commission published a consultation paper investigating how the E-money Directive is currently applied to mobile phone operators and whether changes to the Directive are needed.⁶⁹

The functional, contractual and technical relationships between the parties involved need to be further examined in order to understand the general structure of mobile phone services and to what types of constellations the current legal framework for payment services should be applied.

At the same time, the technical and organisational features of the e-money industry keep developing in new directions, while the rules and regulations applied should cover the same aspects for all types of providers offering similar functions (e.g. via other electronic distribution channels). However, as already discussed, mobile phone operators are not restricted to offering pre-funded payment services to third parties, but can also choose many different functional roles along value and transaction chains.⁷⁰

⁶⁷ Taken from 1.1a2, Association of E-money Institutions in the Netherlands, The Electronic Money Directive: Recapitulation and outlook, Working paper, November 2003 and 1.1a2, Electronic Money and E-money Institutions, Amsterdam, 15 November 2002.

⁶⁸ See for instance table on “National rules related to the right to provide payment services”, in European Commission, Comparative tables on national rules: Answers to questionnaires on national rules by competent authorities, September 2003, www.europa.eu.int/comm/internal_market/payments/framework/comparison_en.htm

⁶⁹ Available at http://europa.eu.int/comm/internal_market/bank/e-money/index_en.htm

⁷⁰ For details on different functional options for the mobile network operators in mobile payments, see Grete Øwre, “What are mobile payments?”, mimeo, forthcoming at www.e-pso.info

A review of the E-money Directive is foreseen for May 2005. It needs to address the most fundamental differences in the legal implementations at national level, and should also lead to clearer guidance on its application to non-bank industries offering electronic payment services on a pre-funded basis.

6.1.3 The “New Legal Framework for Payments” initiative by the Commission

The Commission is working on a comprehensive “New Legal Framework for Payments in the Internal Market”.⁷¹ The framework envisages a codification of various legal instruments in one coherent legal framework on payment services. The discussion on what types of services will be covered by the new framework is ongoing. This initiative does not exclusively affect e-payment services, but will probably have a fundamental impact on their future market structure (e.g. on competition and cooperation between providers operating with different business licences and legal obligations).

Accordingly, the ECB has stressed in its comments on the consultation⁷² that any additional legislative requirement related to payments should be assessed thoroughly with respect to its necessity, and its potential impact on the market structure. The new framework needs to be defined broadly enough to cover later technological developments and address the question of new market entrants coming from other industries. At the same time, it should not allow contradictory national interpretations that might hinder pan-European developments, or that could imply uneven regulatory obligations of different provider groups offering similar services across Europe.

The Commission also intends to incorporate the Financial Action Task Force on Money Laundering (FATF) Special Recommendation VII (SR VII) on wire transfers into Community law. SR VII introduces obligations for financial institutions and money remitters regarding information about the identity of the originator accompanying the transfer. The aim is to assist authorities in combating terrorism by ensuring that basic information is immediately available.

6.2 The Eurosystem’s approach and activities

According to the Treaty establishing the European Community and the Statute of the ESCB and of the ECB, promoting the smooth operation of payment systems is one of the core tasks of central banks. The Eurosystem sees its role in the field of retail payments as that of a catalyst⁷³ and an overseer. Both functions aim at promoting the security and efficiency of electronic payment systems and payment instruments. Part of the central banks’ major tasks include ensuring the soundness of the financial industry, safeguarding public confidence in the currency and in the monetary order, and of supporting

⁷¹ See http://europa.eu.int/comm/internal_market/payments/framework/index_en.htm

⁷² The Eurosystem’s response to the European Commission’s Consultation on the New Legal Framework can be found at www.ecb.int/pub/pdf/other/commentsnewlegalframeworkpayments2004en.pdf

⁷³ By acting as a catalyst for developments in payment systems and instruments, the ECB aims to provide a forum for cooperation between the stakeholders, and to provide analyses and statistics to monitor the work of the market.

the policies of the European Community, especially with regard to the integration of the euro area market.

Owing to the fact that the new e-payment schemes are low in both volume and value and hardly interoperable⁷⁴, the Eurosystem uses a “soft” approach in its role of a catalyst. It endeavours, however, to improve both coordination and transparency in the market. It collects and disseminates statistics, monitors the market initiatives looking for standards and allowing full automation through the payment cycle. It promotes the existence of a solid legal environment for the provision of new payment services. The Eurosystem also monitors and documents the progress made by the banking sector in achieving the Single Euro Payments Area.⁷⁵ The electronic Payment Systems Observatory website (www.e-pso.info) was set up to facilitate discussions on innovations and changes in the retail payment area and to contribute to the achievement of a common payment market in the SEPA.

The **oversight** function of the Eurosystem looks at systems primarily from a safety perspective, but also in terms of aspects of efficiency. It addresses threats and weaknesses that have been identified by setting requirements and checking compliance with them. With regard to retail payments, in June 2003 the ECB published the Oversight Standards for euro retail payment systems.⁷⁶ These draw on the Eurosystem’s awareness that retail payments significantly contribute to the broader effectiveness and stability of the financial system, in particular strengthening consumer confidence and improving the functioning of commerce. The efficient and safe transfer of means of payment in retail transactions can moreover be regarded as an essential function of the currency, with a direct impact on the trust that people have in it. For these reasons, the efficiency and safety of retail payments matter to the Eurosystem.

Box: Oversight Standards of the Eurosystem for retail payments

The Oversight Standards for euro retail payment systems (“Retail Standards”) adopted in June 2003 aim at ensuring a harmonised and systematic oversight of retail payment systems in the euro area. They draw on the Core Principles for Systemically Important Payment Systems (“Core Principles”)⁷⁷ which apply to large-value payment systems. The standards adopted for retail payments contain indicators for categorising systems into systemically important retail payment systems, retail systems of prominent importance, and other retail payment systems. All Core Principles will be applied to systemically important retail payment systems, whereas only a selection of six Core Principles will be applied to systems of prominent importance. Other retail payment systems will have to comply with any other applicable standards (e.g. Eurosystem standards for e-money

⁷⁴ Here we are referring to *direct interoperability*. Interoperability allows a participant of one e-payment scheme to make a payment or receive a payment from a participant of another e-payment scheme. This can be accomplished if both scheme providers belong to a common clearing and settlement system. E-payment schemes usually ensure indirect interoperability through the use of traditional payment instruments (i.e. credit cards), they mainly do not provide direct interoperability still. For details see Kenneth N. Kuttner and James J. McAndrews: Personal online payments in FRBNY Economic Policy Review, December 2001.

⁷⁵ The Eurosystem’s SEPA reports can be found at www.ecb.int/pub/pub/paym/html/index.en.html.

⁷⁶ Available at www.ecb.int/pub/pub/paym/html/index.en.html.

⁷⁷ Bank for International Settlements, Core Principles for Systemically Important Payment Systems, CPSS Publications No 43, January 2001, www.bis.org/publ/cpss43.htm

schemes or nationally adopted standards). The Eurosystem has categorised all retail payment systems in the euro area and is currently assessing all systems against the relevant standards, with the aim of enhancing the stability and soundness of retail payment systems. The standards address legal safety, financial risk management, security and operational reliability, efficiency, access criteria and system governance.

New e-payment schemes belong to the category of “other retail systems”, as they are low in volume and value. Therefore minor e-payment schemes have to comply with some applicable standards, but neither with the Core Principles in their entirety nor with a subset of them. However, some functional elements of e-payment services may attract the specific attention of the overseers, since they are considered as core elements with respect to safety. Such elements are the issuance of means of payment and the functioning of settlement services for (payment) claims arising from the delivery of goods and services. In this context, in May 2003 the Eurosystem published its expectations concerning the technical security approaches adopted by e-money schemes in the Electronic Money Systems Security Objectives report (EMSSO). Due to the early development phase of innovative e-payment schemes (including electronic money) and their little penetration in the market, the oversight activities of the Eurosystem in this field have been limited. However, should the use of innovative e-payment services move beyond its early development phase, an adjustment of the current central bank oversight approach might become necessary.

7. Conclusion and outlook

E-payment providers face many different challenges to develop their services. The growing familiarity of consumers with online media might in the long run substantially favour innovative e-payment schemes (i.e. via a building of trust in e-services, and a growing “next generation” of users). Gaining and balancing the varying interests of both sides in a two-sided market (payer and payee) can increase the challenges, but also provides business opportunities in terms of niche markets and added value. The strategic balancing of cooperation and competition within and across industries was identified as another fundamental issue. One of the most challenging tasks for service development in the coming years in this respect is the development of flexible, interoperable solutions and common standards. Innovative schemes and technical progress may come at considerable cost, and their investments do not always pay off. In particular, they have to compete with established basic solutions that have achieved critical mass. Synergies for e-payments could potentially be exploited if electronic identity projects prove successful in some countries. Users and providers should be permanently aware of security risks and address them accordingly.

The process towards SEPA is driven by the banking industry in conjunction with European regulators. The Single Euro Payments Area by 2010 could further encourage the development and efficiency of new e-payment services. Providers have the opportunity to provide and expand their services to a pan-European customer base. In some insufficiently covered market niches, they can even take a leading position in cross-border transactions against traditional competitors. However, to achieve this they

need transparent and harmonised market conditions that in particular ensure connectivity to traditional payment infrastructures.

The European e-payments market is not yet one without frontiers. Consumers, merchants and providers alike still show a strong home bias in their activities. Nevertheless, a few innovative e-payment schemes already exist that can be used across borders and with different currencies. The regulatory framework for e-payments is further evolving. The Regulation on cross-border transfers in euro generally applies to e-payment schemes. The European Commission intends to harmonise the legal framework for payment services, while the E-money Directive is scheduled for review. One market observation in this context might be of specific relevance for the changing regulatory framework: it is becoming increasingly difficult to categorise the schemes, since formerly specific functions and distribution channels are blurring and merging to produce hybrid products, multi-channelling and new role-sharing models.

At a time when innovation in e-payments might continue to take many different forms and constellations, two aspects are of principal interest from a central bank perspective. First, the issuance of generally accepted means of payment needs to remain restricted to credit institutions. Second, cost-efficient and sound retail payment instruments are being made available to users for existing and emerging commercial transaction needs in the euro area, including the internet, mobile phones and other innovative distribution channels.

The ECB endeavours to improve the development and coordination of e-payments in the market, and to disseminate structural insights and statistics. With the aim of exchanging views and information, the ECB will continue to make use of the e-Payment Systems Observatory platform and to organise events on e-payment-related developments.

Annex 1 - Category sheets for payment concepts

Part 1: Basic payment instruments

1. (Electronic) credit transfers

Concept:	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. It is offered as a payment instrument by the banks (initiation on payer's side).
Means of payment:	Commercial bank money.
Context of usage:	A convenient way for effecting money transfers between accounts as well as between private persons (provided both have accounts and the payer knows the account details of the payee).
Penetration:	Credit transfers are one of the most widely used payment instruments in the EU, with an approximate share of 30% of all non-cash payments.
Innovative usage:	Online banking functions may be integrated into merchant platforms, and initiation methods could use mobile phones, etc. (see also Annex 1, Parts 2.3 and 2.4)

Part 1: Basic payment instruments

2. (Electronic) direct debits (excluding cards)

Concept:	Direct debits are preauthorised debits on the payer's bank account that are initiated by the beneficiary. They are offered as a payment instrument by the banks (initiation on payee's side).
Means of payment:	Commercial bank money.
Context of usage:	Direct debits are often used for recurrent payments, such as utility invoice payments (e.g. for water, electricity and telephone usage), or for one-off payments in connection with remote transactions (where there is no physical contact between the payer and beneficiary).
Penetration:	The second highest number of payments (one-quarter) in Europe is effected as direct debits.
Innovative usage:	Based on a common standard for Pan-European Direct Debit (PEDD) by the European Payments Council ⁷⁸ , a broad range of usage possibilities for cross-border transactions may become feasible, e.g. for online merchants that are currently restricted to accepting only national direct debit payments.

⁷⁸ According to EPC, PEDD will be a "scheme based on agreed rules for collecting payments in euro throughout the Single Euro Payments Area (SEPA) from bank accounts that are designated to support the direct debit instrument. As in many national schemes in operation today, instructions for the collection of funds from a debtor's bank account will be initiated by a creditor through its bank, on the basis of a commercial agreement between debtor and creditor and a mandate given by the debtor to the creditor authorising a single or series of regular collections from the debtors bank account. The new PEDD scheme will be able to handle all intra-EU direct debit transactions in euro both cross-border and national." European Payments Council, Communication on PEDD, June 2004, publicly available at www.ebaportal.info/_download/EPC_Communication_on_PEDD.pdf

Part 1: Basic payment instruments

3. (Electronic) credit card payments

Concept:	Credit card payments are debit instruments, i.e. they lead to debit transactions on the card account of the payer. They allow customers to make purchases and/or withdraw cash as credit from the issuing credit card company. The credit granted by the issuing credit card company 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 arrangements are sometimes called delayed debit cards, but - for the sake of simplicity - both variations are called credit cards in this paper.
Means of payment:	Commercial bank money (invoice amounts collected via direct debit or settled via credit transfers).
Context of usage:	<p>Credit cards were initially designed for payments at physical points of sale. But they were also used for remote payments (“card not present” transactions, e.g. via the telephone) even before they became popular for shopping on the internet. The basic form of usage on the internet is an (encrypted) transmission of the card number and validity date (plus potentially additional code numbers from the card). In order to improve the security of such basic internet-based credit card payments, providers are trying to develop different types of “secure” solutions. Parts of such solutions might, at least from the consumer’s perspective, also be assigned to the next group of “innovative” online services – although they are built on the card’s infrastructure on the merchant’s side, implying no changes for the user group of payees.⁷⁹</p> <p>Credit card transactions at the physical point of sale are also subject to transformation. The changeover to a new generation of chip cards based on the EMV standard is promoted in order to increase security.</p>
Penetration:	Between 5% and 6% of all non-cash transactions in the EU, with business-to-consumer remote transactions being extremely popular.
Innovative usage:	A plethora of card-based innovative schemes have been developed, which inter alia try to enhance the security of (online) transactions or to facilitate person-to-person transfers between credit card accounts. There are also systems available that constitute different combinations of credit card and electronic money schemes (see also Annex 1, Part 2.1).

⁷⁹ Both Visa and MasterCard have developed so-called 3-D solutions where the cardholder is identified via a personal code that is verified by the card issuer when using the card for payments over the internet. In order to increase cardholders’ trust in online card payments, one-off (“virtual”) credit card numbers are an alternative solution. They can be produced when cardholders connect to their bank server over the internet. Both solutions avoid disclosing genuine credit card numbers online. The merchant cannot distinguish between virtual and real credit card numbers.

Part 1: Basic payment instruments

4. (Electronic) debit card payments

Concept:	Debit card payments are debit instruments, i.e. they lead to debit transactions on the account of the payer.
Means of payment:	Commercial bank money (collected via a direct debit for each single payment transaction).
Context of usage:	At point of sale. They provide a convenient way to present the cardholder information needed to initiate a direct debit. This information is embedded in the magnetic stripe (or chip) on the card. A dedicated terminal is required to read the information on the debit card, and possibly to verify whether the debit card is still valid and whether the transaction would exceed any usage limits set for the card.
Penetration:	Debit cards are the most widely used instrument at points of sale. Around one-fifth of all payments are made using debit cards.
Innovative usage:	Some debit card schemes are being adopted for online payments. However, so far credit cards and direct debits have been more successful in new application areas.

Part 2: New e-payment-related services

1. Electronic money and pre-funded payment schemes

<p>Concepts:</p>	<p>Electronic purses (chip card and software-based schemes) Transfer of electronic money between e-purses of payer and payee. Access methods: chip card or software-based electronic purse “containing” stored values. Innovative feature: “Bearer” quality of values; advantages over notes and coin when small, exact amounts at unstaffed locations need to be paid, e.g. at vending, parking and ticketing machines. Examples: Proton, Chipknip, MINIPay, GeldKarte.</p>	<p>Disposable and virtual pre-funded cards Transfer of centrally stored anonymous claims that have been purchased in advance. This works similar to the top-up functions of a prepaid mobile telephone. Funding through cards that are sold at retailers, bank branches, etc., typically with predetermined nominal values, against cash or card payment. Issued either as scratch cards with an identifying number that needs to be revealed, or another means of submitting that number to the buyer (“virtual card” sent via SMS, handout of paper printout, etc.). The number either has to be entered into the issuer’s website to activate the anonymous “card account”, or can be used directly for paying at a content provider’s website. Innovative feature: Flexible use at various communication platforms, no special hardware or software requirements. This means of using funds is simple, transferable and anonymous. Examples: PaySafeCard, MicroMoney, SplashPlastic.</p>	<p>Pre-funded personalised online payments Transfer of rights to funds (similar to a credit transfer) that are stored on personalised online accounts (not including traditional bank deposits). Access methods: internet browser, e-mail or SMS. Use of internet auctions and online trading between private persons and between consumers and small merchants creates a need for fast and easy online person-to-person payments. The schemes operate like bank deposits, i.e. users open dedicated accounts with the payment service provider. Fund transfers can be initiated via e-mail or short mobile phone messages. Innovative feature: Usage for person-to-person payments, simple use of e-mail addresses or mobile phone numbers for opening accounts and for sending money; received amounts can be spent again at once (“real-time” quality), some schemes operate cross-border and allow currency conversion. Examples: PayPal⁸⁰, MoneyBookers, Crandy, PagoWind. .</p>
<p>Means of payment:</p>	<p>Owing to European banking legislation, pre-funded claims that are used as generally accepted means of payment have to be commercial bank money or e-money. This means that either a general banking or an e-money issuer’s license is required in order to offer such payment services.</p>		
<p>Context of usage:</p>	<p>The payer does not need to have or reveal a credit card, debit card or bank account number in order to pay; control of available funds via electronic purses, preferred usage for anonymous payments and small amounts, various value added services</p>		

⁸⁰ The most prominent system in this subcategory is PayPal, which is operating in the EU with a licence as an electronic money institution (supervised in the United Kingdom). PayPal started as an internet payment provider for online person-to-person payments in the United States. It became a publicly traded company in 2002 and was subsequently bought by eBay, a global online auction service.

	are feasible (e.g. differentiation between adult and younger users, in combination with loyalty schemes); usage for small amounts, etc.		
Deployment status and trends:	E-money in general is becoming more convenient: it is contactless, mobile and virtual (cards). Transmitting money is also becoming easy (using e-mail addresses and mobile phone numbers). Pre-funded schemes continue to function well in restricted areas or for closed user groups such as university campuses or companies. Such schemes can serve niche markets that are not completely or efficiently covered by other payment instruments.		
	Chip card e-money has been relatively successful in the Benelux countries, but the take-up in most other European countries has been slow. The Swedish card scheme closed down in 2004, and the Danish one is to follow end-2005. Investments in other countries have ceased. Software-based e-money is even less successful than chip card-based e-money (1% of outstanding value in euro area).	Disposable and virtual pre-funded cards are particularly common in euro area countries. Use with market segments and niche markets such as online entertainment is increasing (e.g. gaming, adult content). Its concept is essential for mobile telecommunications and its use is increasing, but the legal status if values are used for third-party payments is unclear (see next row).	Pre-funded personalised online payments are the newest group of schemes, depending on market niche with significant growth potential. It is offered in a growing number of European countries.
Observations:	<p>There are open regulatory issues owing to technological changes and different legal interpretations at national levels. According to Directive 2000/46/EC of the European Parliament and of the Council of 18 September 2000 on the taking up, pursuit and prudential supervision of the business of electronic money institutions (E-money Directive), issuers of e-money need to hold a banking licence, either as a credit institution or hold a specific license for e-money issuing institutions (ELMIs). In some EU countries small issuers can apply for a waiver if their activities do not exceed certain thresholds in volume and/or regional distribution.⁸¹ Until summer 2004, only very few fully fledged e-money licences had been granted within the euro area (the Netherlands), and only a handful in the non-euro EU and EEA countries (mainly in the United Kingdom and Norway). Most of the e-money issuers that were granted an e-money licence outside the euro area have stated that they wish to expand their services to several European countries. Their activities are, however, in most cases still concentrated on their home country.</p> <p>There is also some blurring with other payment instruments and services. For instance, payment made from an electronic money purse at the consumer's side can be transformed into a virtual credit card number for acceptance at the merchant's side (Moneta Online). Some e-money schemes (e.g. PayPal) seem to allow very fast and flexible funding from a bank or credit card account to the consumer's purse/e-money account, even "just in time" for each single payment transaction. At the same time, the payees may be confronted with the risk that the payer can revoke an e-money payment. Hence, such schemes are not necessarily pre-funded at the payer's side any longer, and nor does the payee automatically receive an irrevocable payment – which was supposed to be one of the advantages of pre-funded schemes.</p>		

⁸¹ For further information on the interpretation and implementation of the E-money Directive, see also Chapter 6, Regulatory framework.

Part 2: New e-payment-related services

2. Cumulative collection services

Concept:	Accumulation of several smaller payments of an individual payer into one single transaction that is settled periodically, for instance at the end of each month.
Means of payment:	Commercial bank money, but also e-money or “company money”.
Context of usage:	Comparable with the deferred payment procedures for settling a collection of several credit card transactions bundled at one invoice. Addresses the need to effect small-value payments on the internet at a cost that is bearable, with a flexible set of pricing options for paying content (pay per page view/click, per minute, per data volume, etc.). Two types of charge options can be distinguished. First, there are schemes in which transactions are settled periodically by means of existing payment instruments, e.g. through a direct debit from the customer’s bank account or via his/her credit card bill. Second, there are also schemes in which the transactions are added to the customer’s invoice by a company with which he/she already has a contractual relationship (e.g. a telephone company or internet service provider).
Deployment status and trends:	Offered in several European countries.
Observations:	Services built on top of basic payment instruments. Cooperation with other types of e-payment service providers may lead to integrated services (see also next section).

Part 2: New e-payment-related services

3. Payment portals and integrated solutions

Concept:	Combined services, allowing merchants to accept various payment options via one central payment service contractor, and allowing other businesses to integrate and automate subsequent processing steps (e.g. sale, payment and invoicing).
Means of payment:	Commercial bank money or all other types of claims.
Context of usage:	Central payment portal solutions with routing connection or payment websites directly integrated at the merchant's website that offer several payment options, often including access to bank accounts (payment instruments such as credit transfers or one-off direct debits) and card accounts. Access via internet browsers or mobile phones. After successful completion of the payment authorisation, the bank (or other payment service provider) confirms the payment to the merchant so that the purchase transaction can be completed. Then the customer is redirected to the merchant's website. Innovative features: integration of bank-based, credit card-based and other types of payment services at the merchant's websites. Examples: Bibit, Nordea Solo, mpay24, T-Pay. If invoices are transmitted electronically to the customer via a payment service provider which collects invoices from several beneficiaries for the customer, this service is called Electronic Bill Presentment and Payment (EBPP). The benefits for the companies include reduced billing (printing and postage) costs, and more precise payment information, facilitating easier reconciliation of payments. Also on offer are secure internet platforms for businesses (e.g. call centres, e-commerce shops) that need to integrate secure online payments into their sales applications or website (e.g. Ogone), or that want to have one solution platform for e-banking, e-invoicing (electronic receipt, archiving and paying of invoices), electronic signatures for signing contracts and authorising transactions (e.g. Isabel).
Deployment status and trends:	Such services are on offer to a varying extent in several European countries. The use of electronic invoicing is still growing relatively slowly, but with increasing momentum in the business-to-business sector. For retail transactions, it seems as if both companies that write large amounts of invoices and financial institutions are waiting for the market to reach critical mass before they enter it.
Observations:	Electronic identity projects and standards for internet and mobile banking are important cornerstones for the development of these services.

Part 2: New e-payment-related services

4. Mobile payments

Concept:	A large variety of mobile e-payment-related services have been developed or are conceptually feasible. ⁸² Mobile payment services can be funded from a prepaid airtime account or can be added to one's telephone bill (hence carried out directly by the mobile network operator). The mobile phone can furthermore be used to initiate debit payments from the mobile phone holder's credit card or directly from his/her bank account (hence the mobile networks have a role in messaging). Alternatively, transactions can also be effected on the basis of electronic money schemes (with electronic purses either integrated into mobile devices or their values stored separately, e.g. on a server or an interoperable chip).
Means of payment:	Mobile payments can rely on different ways of paying and therefore also on different claims. Mobile payment schemes either rely directly on commercial bank money, or at least need to have an interface to the banking sector in cases where mobile operators also act as settlement agents. The development of viable cooperation models between banks and mobile providers is therefore a major issue.
Context of usage:	Payments made via mobile phones can be conducted to pay for digital goods delivered over the mobile phone, for goods ordered via the internet, and for goods or services bought in the physical world. There are different technical solutions for mobile payments. For proximity payments, the payment message can also be transmitted contactless, e.g. via radio frequency (for instance in public transportation). For distance payments, the communication usually takes place with the help of SMS or automatic voice messages. So far, the market for mobile digital goods (ring tones, logos, games, etc.) is well-developed. The dominant payment solution for these services is premium-rate SMS. SMS are settled either over the telephone bill (post-paid) or via prepaid airtime. The market is at a less developed stage for more advanced types of mobile payment services, which are struggling to acquire the necessary number of active customers and attractive merchants, to define common standards and to address emerging security issues.
Deployment status and trends:	Mobile payment services are offered in many national markets, using different technical standards and different means of payment. There is so far little progress visible on the standardisation and interoperability of payment solutions between mobile network operators in the national markets, and even less at the European level. There are, however, national mobile payment solutions that aim at expanding their services to other countries. There is also an initiative to create a new European-wide mobile payment service.
Observations:	The application of the E-money Directive to certain business categories is controversial, for instance prepaid payment services by mobile operators for third-party offerings (see sub-section 6.1.2).

⁸² For a more detailed discussion, see Grete Øwre, "What are mobile payments?", mimeo, forthcoming at www.e-pso.info and Autorité de régulation des télécommunications, Etude relative aux moyens de paiements mobiles, May 2004, www.art-telecom.fr/publications/etudes/paie-mob/etude-paie-mob-0504.pdf

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- 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: ensuring the “free movement of information society services between Member States”. http://europa.eu.int/comm/internal_market/en/ecommerce/index.htm
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- Banking Directive (2000/12/EC, amended by 2000/28/EC) of September 2000: European passport for credit institutions to offer services and set up branches in other Member States. http://europa.eu.int/smartapi/cgi/sga_doc?smartapi!celexapi!prod!CELEXnumdoc&lg=en&numdoc=32000L0028&model=guichett
- E-signatures Directive: Directive 1999/93/EC on a Community framework for electronic signatures: acceptance of the legal validity of an electronic signature in all Member States, provision without national obstacles. http://europa.eu.int/eur-lex/pri/en/oj/dat/2000/l_013/l_01320000119en00120020.pdf
- Recommendation concerning transactions by electronic payment instruments and in particular the relationship between issuer and holder (97/489/EC): division of liability between the consumer, the merchant and payment service provider. Study on the implementation of Recommendation 97/489/EC concerning transactions carried out by electronic payment instruments and in particular the relationship between holder and issuer. http://europa.eu.int/comm/internal_market/payments/studies/recomm-1997-489_en.htm_en.htm