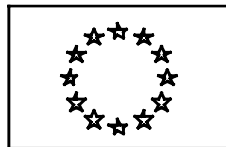


**Study on Electronic Payment Systems**  
**for the**  
**Committee on Economic and Monetary Affairs**  
**and Industrial Policy of the**  
**European Parliament**

**Volume I: Main Report**  
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**Institute for Prospective Technological Studies (IPTS)**  
**European Commission, Joint Research Centre,**  
**Seville, Spain**

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## Foreword

In August 1998 the President of the Economic and Monetary Affairs and Industrial Policy Committee of the European Parliament requested IPTS to undertake a study on Electronic Payment Systems for completion early in 1999.

I have been closely following the development of this study from the very beginning. With the presentation of the present report, I am confident that the options for electronic commerce and electronic payment systems highlighted in the study will contribute positively to the continuing discussions on the most favourable conditions for the deployment of electronic commerce and the adoption of adequate payment instruments. These conditions should clearly allow the EU to promote the rapid spread of the use of electronic money, whilst respecting consumer interests in privacy, safety and user-friendliness, and safeguarding both central bank control of the money supply and financial stability.

Alman Metten MEP  
Amsterdam, May 1999

The role of the Institute for Prospective Technology Studies (IPTS) is to observe and follow up technological change, in the broadest sense, in order to gain a better understanding of its links with society and the economy. IPTS carries out this task with scientific rigour in the fields of information technology, energy, environment and health. At the same time the Institute undertakes research to facilitate a better understanding of new technologies and their impact, and more generally of the relationship between the economy, technology, and society. The present work fits within the mandate of the IPTS to alert European policy makers to selected topics. It is also particularly timely. Overcoming potential barriers to the deployment of E-Commerce and ensuring the adoption of adequate means of payment are essential steps at the dawn of European Monetary Union and a truly single market.

**IPTS wishes to thank all those experts who responded to the successive calls for contributions to this study, and the participants in the study –workshop held in Amsterdam on 31<sup>st</sup> March, 1999.**

The quantity and quality of this input has enabled a document to be produced, which we trust will prove useful. In view of the complexity of the matter, we also hope this report will provide a sound basis for policy discussion on electronic payment systems and commerce across the EU.

IPTS, Seville, May 1999

## Executive summary

This study has been carried out on behalf of the European Parliament with the aim of producing an overview of currently available analyses on key policy questions about the deployment of electronic commerce and the introduction of new payment systems.

### Security issues and e-commerce

Initial projections on the growth of e-commerce were based largely on assumptions that technology would progress to serve demand, which itself would be based on increasing levels of security. However, security levels and regulation did not progress at a speed that would keep them ahead of the Internet's rapid proliferation. Among experts there is no clear consensus on the effects of security factors on the deployment of e-commerce. Beyond payment systems, there are other factors frequently considered to be important. These include cultural, generational, linguistic and computer-literacy barriers, as well as growth factors related to the penetration of Internet infrastructure, to telecommunication costs, the added value of on-line business solutions, to standardisation and finally to legal issues, in particular those related to consumer protection.

Nevertheless, the debate continues about the future demand for sophisticated security solutions, such as SET (Secure Electronic Transactions) and electronic money systems. The USA paradigm of a more advanced e-commerce situation suggests that legal consumer protection issues, rather than technical security solutions may be of key importance.

### EMU and prospects for cross-border e-commerce

Experts tend to agree that the introduction of the Euro will lead only to a moderate increase in the spread of cross-border payments and e-commerce in Europe. The advantages of eliminating exchange rate fees and the risks involved are strongly counterbalanced by the barriers mentioned above, particularly by the existing legal uncertainties for cross-border transactions and e-commerce.

### Standardisation

There is wide agreement that market forces should lead standardisation efforts. Regulators should limit themselves to promoting standardisation. Several competing payment instruments are expected to co-exist in the future, because users demand different payment instruments for different types of transaction. The potential of micro-payment systems for on-line transactions and whether there is a real business case for such systems, at least in the short term, is currently the subject of debate.

### Regulation, monetary policy and stability

Several positions on issuing electronic money are being considered. The option of allowing financial institutions apart from banks to issue electronic money is increasingly supported on the grounds that this solution is expected to favour innovation and competition. Conversely, this option is firmly opposed by most representatives of the banking industry. Their major concerns centre on the protection of consumers, the soundness of institutions issuing electronic money and the integrity of financial markets, as well as the potential risks of fraud and money laundering. Nevertheless, as long as authorities remain vigilant and able to respond flexibly to new developments, there are no grounds for particular concerns about the potential impacts of electronic money on monetary policy and stability, at least for the foreseeable future. Ultimately, the crucial issue is that prudent supervision by the monetary authorities should take place in a systematic, comprehensive and sustainable way.

# Introduction

## Scope of the study

The study aims to provide a **comprehensive panorama of the positions of all participants concerned with the EMU and the introduction of new payment systems within the EU**. To this end IPTS, in co-operation with the European Science and Technology Observatory (ESTO), has been examining key **policy statements and questions**, both with experts in Member States and on a global scale.

## Questions and policy statements from the European Parliament formulated for this study

### *1. Does the absence of a safe and widespread electronic payment system hamper the growth of e-commerce?*

E-commerce is growing fast. However, previous estimates of the rate of growth of e-commerce have been over-optimistic. Is this because these were based on questionable assumptions about consumer and company behaviour? Are existing, conventional methods of payment adequate for the purposes of e-commerce? What role does risk awareness of companies and customers play in acceptance levels for secured and unsecured methods of payment? What are the prevailing criteria for adopting various cost-effectiveness and safety measures currently achievable by available and emerging payment systems? Is the rapid spread of e-commerce largely dependent on unresolved safety and regulatory issues? Can any other important drivers or obstacles in the deployment of e-commerce be identified?

### *2. Will monetary union speed up cross-border e-commerce within the EU and worldwide?*

This question focuses more on **cross-border payments over the Internet**. What is known about the current size of cross-border payments? Has the lack of a common currency been a major constraint on the development of cross-border e-commerce? Will the introduction of the Euro lead to a surge in its development? In particular, for which types of products and services is cross-border e-commerce expected to increase?

### *3. What are the costs of non-standardisation of electronic payment systems?*

It should not be taken for granted that **standardising electronic payment systems is essential**. If electronic payment were to follow the "credit-card model" several payment systems might well co-exist. How likely is such a scenario and what costs would non-standardisation entail for consumers, firms and regulators?

#### ***4. Should markets or regulators impose future standards – if necessary – for electronic payment systems?***

**Standardisation might either evolve from market forces or be imposed by regulators.** Given existing market imperfections, there is no guarantee that market forces will produce the most efficient outcome. On the other hand, imposing standardisation by regulators runs the risk of stifling innovation in this field. Moreover, if international regulators fail to co-operate, it could lead to a fragmentation of markets. Are there any past examples of technological standardisation, which could serve as models for the development of interoperability standards for electronic payment systems both in Europe and on a global scale?

#### ***5. How should issuers of electronic money be regulated?***

It has been suggested that only financial institutions should be allowed to issue electronic money. However, there are alternative options for regulating issuers of electronic money, which would entail issuers having a different status to financial institutions. Which minimum rules should be imposed upon issuers of electronic money and who should monitor them?

#### ***6. How will electronic money affect monetary policy-making?***

**The widespread use of electronic money could affect the stability of money demand.** This would further diminish the relevance of monetary aggregates as guides for monetary policy-making. Another possible effect of the widespread use of electronic money is a reduced demand for central bank money by commercial banks. As a consequence, it would be harder for central banks to control the money market. Various solutions have been proposed to enable central banks to deal with these problems. If electronic money is only a substitute for “official” money, central banks could simply widen the definition of their monetary aggregates to include electronic money. As the most far-reaching way to secure their hold on the money market, the central banks could impose reserve requirements on electronic money balances. This raises several questions:

- **How likely is the widespread use of electronic money?**
- **Can e-money be considered as a new "type" of money?**
- **Will it be limited to small amounts?**
- Will it only be a substitute for “official” money?
- Over what volume would the replacement of “official” money by e-money represent a threat for monetary policy?
- Are the measures proposed to secure the central banks’ hold on the money market sufficient? What are the costs of these measures?
- If electronic money were to affect monetary policy-making, what kind of measures would allow central banks to keep control of the money market?

## List of Contributors

A large-scale consultation among nearly 500 experts and interested parties in the EU and worldwide was carried out by IPTS on the basis of the six questions posed by the Parliamentary Committee. Colleagues within the European Commission from Directorates-general XV, III, X, II, XIII and XXIV were contacted. DGXV co-ordinated an inter-service review of the study results.

### The following submitted detailed positions and analyses to IPTS:

**Central Banks:** European Central Bank, Bank of England, Bank of Finland, Deutsche Bundesbank, De Nederlandsche Bank, Riksbank Sweden, Danmarks Nationalbank, Banco de Portugal, US Federal Reserve System, Federal Reserve Bank of Atlanta, Banco Central de Reserva del Perú, Reserve Bank of Australia, Reserve Bank of New Zealand.

**Bank Associations/ International Organisations:** Fédération Bancaire de l'Union Européenne (FBE), Bank of International Settlements, APACS (UK), European Savings Banks Group, Swiss Bankers Association, UNCITRAL Secretariat (UNO), CEDI (Confédération Européenne des Indépendants).

**Private Banks:** Royal Bank of Scotland, Lloyds TSB Group (UK), Halifax (UK), Deutsche Bank (Germany), Sparkassen SIZ (Germany), Erste Bank (Austria), Alpha Credit Bank (GR), Leonia Bank (Finland), Cera Bank (Belgium), Den Danske Bank (Denmark), AIB Bank (Ireland), Rabobank (The Netherlands)

**Card Industry:** Europay, Interpay, VISA, SERMEPA/VISA (Spain), Cyber Cash, Sistema 4B, NTT

**Certification Agents:** Agencia de Certificación Electrónica (Spain).

**Technology/System Providers:** IBM (several contributions), Intuit, Groupe Bull, Hitachi, Meta Group (several contributions), Debis Systemhaus (several contributions), DEC, SUN Microsystems, Information Services International-Dentsu LTD (Jp).

**E-commerce/Retailers:** Bertelsmann AG, Svensk Handel, E-Commerce Europe (ECE), Lufthansa.

**Experts/Academia/representatives of DGs:** Anderson Ross, Duncan Goldie-Scot, E. Alyanakian, C. Kuner, H. Konstapel, S. Gazziano, R. Field, A. Prinz, I. Grigg, D. Bartmann, A. Weber, Scott Smith, D. Nolle, M. Bruestle, C. Centeno, E. Tranoy, F. Simon, B. Rivetti, J.C. Mizzi, D. Herson, P. Kersten, T. Vissol, M. Escher, G. Bannock, Anne & Lynn Wheeler, Man-Sze Li, L. Gramlich

## The contribution of ESTO (European Science & Technology Observatory)

IPTS was able to call upon the services of ESTO (the European Science & Technology Observatory) for certain aspects of the study. ESTO is an initiative of IPTS. It consists of 14 European organisations, which share the responsibility of providing timely access to information on the socio-economic implications of selected scientific and technological advances.

A study-specific network was therefore set up within ESTO. The participating experts and task allocations were the following:

- J. Leyten, M. van Staden STB, TNO, NL: Question No 1 + Country Report NL
- D. Birch, Hyperion, UK: Country Report UK
- K. Boehle, U. Riehm, M. Rader , ITAS, D: Question No 3 + Country Report D
- C. Goldfinger, P. Herbin, GEF, Brussels: Question No 4 + Country Report F
- M. Falch, CTI/DTU, Denmark: Question No 5 + Country Report DK
- J. Valls, A. Arbussà Reixach, UDG, Spain : Question No 6 + Country Report E
- A. Backlund, NUTEK, Sweden: Country Reports S + FIN
- P. Bucci, Rome, Italy: Country Report I

The question numbers above refer to the parliamentary questions listed in the outline of the study. Reports on the above tasks were submitted to IPTS between December 1998 and May 1999. Final versions of these contributions and an **EU-wide Country Synthesis Report**, issued by ITAS, will be published as independent documents complementing the current report.

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## EU activities in the field of Electronic Payment Systems<sup>1</sup>

Over the last two years the European Union and the European Commission have been developing intensive work programmes under the generic name of *Electronic Commerce*. An overview of the variety of subject matters covered by the EU programme, as well as within the work programmes of international bodies and international relations with major industrialised countries, is given in the tables annexed to this report. The annex also gives more details of the most relevant legislation and initiatives on payment systems.

Payment systems' include several different methods of payment, (e.g. by cash, personal/company/bank cheques, credit and debit cards, standing orders, direct debits, bank transfers, international money orders. The EU has responsibilities for all means of payment. The only sector where no initiative was taken is the area of cheques. However, payment systems also cover transfers and remote payments. An initial Communication of 1990, *Making Payments in the Internal Market*, has anticipated most of the barriers to a "free payment area" in the EU.

Since then, many of the objectives set out in the Communication have been achieved by EU legislation or by a Commission Recommendation.

In 1997 the *Directive on Cross-Border Transfers* (banking giros between Member States), and the *Recommendation on Instruments of Electronic Payments* was adopted. Furthermore, the so-called new means of payment, with a consumer protection approach saw the adoption and the proposal of several legal instruments: a Directive on Finality of payments and settlements, the Action Plan on Fraud and Counterfeiting, a draft Directive on e-money with a purely prudential approach, as well as a draft Directive on the distance selling of financial services.

Several other legislative developments are expected in 1999, in particular the publication of a new Commission Communication entitled *Making payments in the EMU*, which will give an overview of the remaining obstacles to free cross-border payments. These payments need to be as quick and secure as domestic payments, and to cost the same price, in whatever field of industry. Of course, this requirement addresses more than electronic payment methods and systems. Most of the payment systems in the wholesale sector, if not all, are already electronic. This is not the case in the retail sector, including the corporate sector. In some countries the use of cash, cheques, and bank giros by individuals and by companies can amount to a significant proportion of overall retail payments (see the Blue Book of the former EMI, now the ECB).

Further achievements expected in 1999 include progress in the use of e-money and distance selling of financial services; measures against fraud; a possible new draft directive on the finality of payments, a new competition notice and pilot actions on standardisation.

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<sup>1</sup> Contributed by DGXV on behalf of the Interservices Group on New Means of Payment (EC-ISGNMP), Brussels 28 January 1999

## Working definitions and terminology

The questions and statements formulated specially for this study by the European Parliament use a number of terms for which no generally accepted definitions exist as yet. In this context, the following “working definitions” were adopted during the present study and were found to be useful (without claiming to solve current definition problems encountered in legislative initiatives; see Chapters 5 and 6).

**‘Electronic payment systems’** refer to those where the processing of payment instructions is carried out by the banking system electronically. This is true of the majority of current EU payment systems, including systems used to handle retail payments (giro credits, most debit and credit card transactions and even some cheque processing). The main exceptions are in countries where cheques are still cleared physically.

**‘Electronic commerce’** (or e-commerce) refers to trade and business processes that take place electronically – typically over the Internet. As such it involves several steps: a means of doing a deal, the exchange of information, eventually the on-line or off-line delivery of the product (or service) purchased and the payment for that product. The payment could be made using “electronic money” or an “electronic access product” – both defined below - or indeed by some other method for exchanging value in a broader sense.

**‘Electronic money’** (or ‘e-money’) is a relatively new concept. Traditional payment systems (electronic or otherwise) are used to transfer funds or values held in accounts at banks (or possibly other types of financial organisations). In contrast, ‘electronic money’ refers to a stored value or pre-paid product. This allows a record of the funds or value available to consumers and to all interested economic parties to be held on an electronic device in their possession.<sup>2</sup> The definition covers both pre-paid cards, sometimes called ‘electronic purses’, and prepaid software products that use computer networks such as the Internet, sometimes called ‘digital cash’.

**‘Electronic access products’** differ from electronic money as just defined above. They allow consumers to use electronic means of communication to access otherwise conventional payment services. A good example is the combined use of a standard personal computer and of a computer network such as the Internet to make a credit card payment or to transmit instructions to a bank to transfer funds between bank accounts. Here, the underlying payment instrument (e.g. the credit card or giro transfer) is nothing new. What is new is the means of communication, i.e. using the Internet rather than making a personal visit to the bank, using written instructions (such as a cheque) or giving the instruction over the telephone (telephone banking).

**‘Payments on the Internet’** can therefore refer to either the particular type of electronic money that involves a software product (although at the moment there is no such product in general use) or to electronic access products (via a card reader and a computer), or to both of these. Systems are also emerging that will allow the use of electronic (prepaid) money to be used over a network, by allowing the cash balance of the prepaid card to be drawn in accordance with the value of the goods or services purchased. Internet payments systems cover transactions both wholesale (between companies) and retail (between consumers and companies). Methods of payments include: bank transfers, cheques, credit and debit cards, and prepaid debit cards.

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<sup>2</sup> Although the value will typically still be the liability of a bank or other type of financial organisation, and often will have been loaded onto the consumer’s device by withdrawing the value from a bank account.

# 1. Security and growth issues in e-commerce

## Does the lack of a secure and widespread electronic payment system hamper the growth of e-commerce?

IPTS collected a complete spectrum of possible responses (the allocation to the following three categories was in some cases the result of a particular interpretation by IPTS and is therefore subject to verification):

- **Yes:** *Riksbank Sweden, Danmarks Nationalbank (safety rather than the prevalence of electronic payment systems tends to hamper the growth of e-commerce); Banco Central De Reserva Del Peru, Swiss Bankers Association (SBA), Alpha Credit Bank (secure payments are vital...), Svensk Handel, K.H. Achinger DEBIS (yes, but only to some extent...), Sistema 4B, ACE (SET is needed...), E. Alyanakian, D. Bartmann-IBI,*
- **No:** *De Nederlandsche Bank, AIB Bank, Den Danske Bank, ESBG, Deutsche Bank, APACS, Royal Bank of Scotland, Rabobank (only a little influence...), R.L. Field, Ross Anderson, Bertelsmann, Intuit, EC-ISGNMP, Brokat.*

Experts believe that existing electronic payment systems are sufficiently operational to guarantee overall growth. Payments constitute only one of the links of the e-commerce value chain, and in general they are not the weak link.<sup>3</sup> However in combination with the rest of the chain, including the clearing services, they determine **security, trust and confidence**, which are seen as the most important pillars of e-commerce<sup>4</sup>.

- **Yes and no:** *Bank of Finland, Cera Bank<sup>5</sup>, NTT, R. Lowrie-IBM, P. Janson-IBM, A. Drapp-Hitachi, A. Prinz, G.P. Dwyer Jr.,*

In most cases, the answer "Yes" represents a conviction of the adequacy of existing payment instruments for medium- and high-value on-line transactions (>10 Euros). "No" represents awareness of the lack of payment instruments for micro-payments and peer-to-peer transactions (between households). Some experts believe that in addition to trust, concerns about authentication and non-repudiability are major issues.

Initial projections regarding the growth of e-commerce were based in large part on circular assumptions that technology would progress to serve demand, which itself would be based on increasing levels of security. In fact, security levels and regulation have not progressed at a speed that

<sup>3</sup> APACS

<sup>4</sup> Europay, VISA

<sup>5</sup> It does not hamper the success of well-known reputable institutions or the increasing success of certain new e-commerce companies which have become known worldwide. However, it does hamper the growth of other, less-known companies, because many users of the Internet do not trust the present non-secure payment systems.

would keep them just ahead of the Internet's proliferation. Thus, by late 1996 and early 1997, as large investments were being made to build out consumer Internet commerce infrastructure, the demand being driven by this investment ran up against a lower-than-expected level of security for payments<sup>6</sup>. This "hiccup" slowed the growth curve, at least to a point in late 1997 and early 1998 when a sufficient level of consumer experience was attained to demonstrate the available technology (SSL-encrypted transactions) was *good enough* to sustain consumer transactions until better technology arrived<sup>7</sup>. In addition, merchants and industry groups stepped into the void and began emphasising the security of major consumer web sites.

Although e-commerce appears to have grown more slowly than early optimistic estimates predicted, it is not clear whether growth rates are being significantly affected by the lack of new payment instruments<sup>8</sup>. Beyond payment systems, other factors are also frequently considered to be important for e-commerce. Some of those reported<sup>9</sup> to IPTS can be grouped as follows:

- Lack of computer literacy and infrastructure at both the supplier and consumer ends.
- The existence and the size of an electronic marketplace.
- Cultural, linguistic and generational barriers.
- The availability of venture capital.
- Telecommunication costs.
- The extent and quality of business solutions (goods and services) made available over the Internet, and the added value offered to the consumer.
- The contractual/legal framework.

A dynamic interaction exists between the factors mentioned above, the development of electronic payment systems and the growth of e-commerce. As the use and contents of the Internet develop, utilising it as a medium for commerce will become more financially interesting. At the same time, this will create stronger incentives for developing secure and user-friendly electronic payment systems. The "user-friendly" aspect also comprises the creation of common standards and interoperability between different systems, without which a critical mass of consumers is unlikely to be reached. Figures from recent Internet user surveys (shortly to be published in an ECB report on banking developments) estimate that only 7.4% of EU citizens are Internet users and therefore consumer penetration of e-commerce cannot be deep. Furthermore, it is widely accepted that the US e-commerce market is more developed than that in the EU<sup>10</sup>.

Particular reference needs to be made to special conditions in developing countries. Key issues reported are <sup>11</sup>the absence of appropriate consumer protection schemes, and slow deployment of electronic payment systems (current systems are basically paper-based).

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<sup>6</sup> S. Smith-CurrentAnalysis,

<sup>7</sup> S. Smith-CurrentAnalysis, D. Bartmann-IBI,

<sup>8</sup> US Federal Reserve System

<sup>9</sup> Bank of England, De Nederlandsche Bank, Banco Central de Reserva del Peru, Riksbank Sweden, US Federal Reserve System, APACS, Erste Bank, Alpha Credit Bank, Leonia Bank, Bertelsman, Intuit, K.H. Achinger DEBIS, META Group, Brokat, CEDI, E. Alyanakian, Lufthansa, E. Blot-Lefevre-ECE, Sun Microsystems (the vast majority of e-commerce-enabled sites have been ill-conceived), IC Focus

<sup>10</sup> Bank of England, EC-ISGNMP

<sup>11</sup> Banco Central de Reserva del Peru

From the point of view of the retail sector, the success of e-commerce in the USA shows that e-payment systems are not a prerequisite for e-commerce at all<sup>10</sup>. As long as customers accept (or get used to) giving their credit card numbers or using direct debit systems (such as in Germany), other e-payment systems are not necessarily needed.

“Business-to-Business” (B2B) e-commerce is considered<sup>11</sup> likely to grow, as large firms increasingly demand that their suppliers/customers adopt Electronic Data Interchange (EDI) and do business in this way. However, the high cost and complexity of EDI implementation remains a major reason for the low penetration of EDI today, especially among SMEs<sup>12</sup>. In future, it is anticipated that EDI standards will progressively converge and migrate to the Internet environment.

According to the EC-ISGNMP (Interservices Group on New Means of Payment of the EC) the lack of *de facto* standards at international and European levels has brought about multi-standard e-commerce platforms. In addition, the rigid stance of Member States on encryption mechanisms is an added barrier to the uptake of secure, cheap and easy-to-use security mechanisms.

Work analysing the impact of currently available electronic payment systems is being conducted in several institutions<sup>13</sup>. Novel systems of electronic payments<sup>14</sup> are also under development with the aim of encouraging the use of e-commerce.

Based on this analysis of the security issue, the next chapters (1.1 through 1.5) discuss questions related to the general growth of e-commerce are addressed, in particular:

- the adequacy of conventional payment system.
- the perception of risks associated with methods of payments.
- criteria for the cost-effectiveness of adopting achievable security levels
- unresolved issues related to security and regulation.

## 1.1 Growth of e-commerce and behaviour of consumers and firms

**E-commerce is growing fast, but previous estimates of its rate of growth have been over-optimistic. Is this because they were based on unsubstantiated assumptions about consumer and corporate behaviour?**

Although the development of e-commerce may not have met the most optimistic growth projections, several interested parties<sup>15</sup> agree that it increased rapidly in 1998, albeit from a low base. In particular, the Deutsche Bank estimates that e-commerce is currently growing very fast (300-600%). It is

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<sup>10</sup> Bertelsmann

<sup>11</sup> R. Lowrie-IBM

<sup>12</sup> IC Focus

<sup>13</sup> The Danish Ministry of Research and Information Technology is presently preparing an Action Plan on Electronic Commerce

<sup>14</sup> Europay International, together with its partner MasterCard International, is working intensively to develop an open industry standard based on chip card technology for making payments over the Internet, Swiss Bankers Association (SBA: -PayNet)

<sup>15</sup> US Federal Reserve System, Deutsche Bank, Royal Bank of Scotland

increasingly understood<sup>16</sup> that the explosive growth of Internet has created both opportunities and expectations for a similarly explosive growth in e-commerce, once secure payment systems are widely available. The emerging electronic marketplace offers unprecedented opportunities for access to global markets at a very low initial investment, especially for small businesses, but with SME markets initially enhanced on a local market basis first.

E-commerce has particularly taken off where the overall value chain is simplest<sup>17</sup>. The predominant areas are those of Business-to-Business (B2B) and of consumers buying goods over the Internet, where:

- consumers can easily locate providers through the Internet, usually through well-known brands or by using search engines;
- the plastic card medium is accepted and well understood by both parties;
- the plastic card mechanism provides not only the method of payment but also the guarantees to both parties which create the trust necessary for the transaction to proceed.

Many early estimates presumed that e-commerce would penetrate the more difficult, complex markets with the same speed as the simpler markets, but they were based on questionable assumptions about consumer and company behaviour. They also did not give sufficient consideration to the complexity of developing the technical and organisational infrastructure of e-commerce<sup>18</sup>. In addition, suppliers may not have had sufficient resources available to develop e-commerce systems for their products while simultaneously facing the major IT challenges of the Euro's introduction and the Year 2000 bug.

In e-commerce, the fundamental question is how to establish the business/customer relationship in a secure way. It is reported that only 10% of the holders of an e-mail address have made on-line shopping purchases. Most importantly, less than 1% make regular purchases<sup>19</sup>.

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<sup>16</sup> Europay

<sup>17</sup> APACS

<sup>18</sup> Deutsche Bundesbank, Bank of England, APACS, META Group

<sup>19</sup> Fintel

There are many uncertainties and potential risks that reduce willingness to engage in e-commerce and thus limit its projected expansion. Reported **issues and barriers** for the deployment of e-commerce follow below.

- **Newness.** Both B2B and B2C types of e-commerce are at an initial “discovery” phase<sup>20</sup>: e-commerce is still new. Much of the population of Europe is not yet accustomed to using electronic media or aware of the new possibilities offered by e-commerce<sup>21</sup>. The complexity of on-line transactions and the differences between these compared to consumers’ experiences at traditional points of sale hamper e-commerce. Many customers used to existing shopping methods may be reluctant to learn new ones, especially if they have little experience of computers. Personal advice and individual, customised service are still greatly valued, especially in the relationships between smaller firms and their clients. Such habits, part of the culture of different countries, are slow to change.
- **Mistrust.** E-commerce’s replacement of personal contacts by remote relationships leads to uncertainties about trusting<sup>22</sup> the business partner. The “trust ingredient” includes issues of how to prove the identity of the counter-party as well as how to ensure reliable payment and proper delivery of goods. Certainty over payments depends on mechanisms, which ensure the ability to meet liabilities. The rapid spread of e-commerce will depend on successful marketing and promotion of e-commerce facilities, raising the awareness of both firms and consumers<sup>23</sup>. (For questions about legal uncertainty in electronic marketplaces see also Chapter 1.5.)
- **Lack of interoperability among banks**<sup>24</sup>. The lack of integrated EDI in financial services is an impediment<sup>25</sup>. Financial institutions need to show commitment to integrating e-commerce facilities into their existing payment services.
- **Privacy concerns**<sup>26</sup>. The risk of unauthorised collection of customer data e.g. by utilising Internet ‘cookies’, is a barrier.
- **‘Seeing is believing’.** Many products are by nature such, that seeing them in real before making a buying decision is desirable<sup>27</sup>. Examples of these could be clothes, fresh food, groceries etc.
- **Commercial logistics.** Barriers related to the logistics of trade have been widely overlooked<sup>28</sup>.
- **Value-Added Tax (VAT).** Confusion over VAT, the Single Market and the control function of Custom Authorities<sup>29</sup> is an impediment.

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<sup>20</sup> P. Janson-IBM, I. Grigg

<sup>21</sup> Bank of Finland, ESBG

<sup>22</sup> Bank of Finland, ESBG, APACS, Europay, VISA, R. L. Field, META Group (this is about 20% technology and 80% marketing to shape the customer’s expectations)

<sup>23</sup> Reserve Bank of Australia, META Groupe,

<sup>24</sup> According to the FBE, interoperability among banks depends on a judgement as to whether there is a business case. Institutions dedicated to gain revenues cannot be expected to show commitment to any service which is not regarded appropriate to generate income streams.

<sup>25</sup> Reserve Bank of Australia, D. Bartmann

<sup>26</sup> Bank of Finland

<sup>27</sup> Bank of Finland

<sup>28</sup> Svensk Handel; Fintel. An analysis has shown that Amazon.com cannot create a profit with the present average value per trade compared to the costs of preparing orders. In order to generate revenues, they need to either reduce the order preparation costs or find the means to increase the average size of orders (around 50 USD per order).

<sup>29</sup> Svensk Handel

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- **Intellectual Property Rights (IPRs).** IPR and copyright protection must be adapted to the dissemination of electronic media through the Internet. This requires technological and regulatory advances<sup>30</sup>.
  - **Restricted access to credit card processing by small companies.** Many small companies are barred from access to payment mechanisms due to their size, credit ratings, cost or recent establishment.
  - **Additional hard- and software costs**<sup>31</sup>. Along with telecommunication costs these still represent an obstacle, but are already being tackled with the price of a typical PC coming down from ECU 2000 to ECU 1000 over the last eighteen months, and telecoms costs continue to fall since deregulation. Cheaper net access (e.g., through digital TV set-top boxes) will also encourage the development of e-commerce, as will the trend towards providing the basic means of access virtually free of charge, recovering such cross-subsidies through the charges of use.
  - **Skills shortage in information technology.** Current big projects like the Euro and Y2K will continue to drain programming talent from e-commerce, at least for the next two years<sup>32</sup>.
  - **Lack of overall standards,** in particular for B2B transactions<sup>33</sup>.

**Security and trust** are essential in all steps of an electronic commercial transaction, from ordering, through delivery, to the payment of goods, but also for dealing with defective goods, incorrect delivery, and disputes which may occur in any business relation, whether electronic or traditional. Uncertainty over these elements continues to represent major obstacles to an extensive growth of e-commerce, especially for higher value transactions.

However, the above-mentioned factors are less problematic for small value transactions<sup>34</sup>, such as buying books or CDs, and for the trading of intangible goods, due to the lower financial risks involved and the verifiable quality of such goods. Consequently, these currently represent the main growth areas in e-commerce (see chapter 1.5 on emerging e-commerce regulation).

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<sup>30</sup> Fintel, C. Centeno-Crescendo

<sup>31</sup> CEDI, ESBG, Ross Anderson

<sup>32</sup> I. Grigg

<sup>33</sup> M.S. Manasse-DEC, R. Lowrie-IBM (B2B will grow as EDI standards become one standard, and incorporate the Internet environment)

<sup>34</sup> ESBG

## 1.2 E-commerce and conventional methods of payment

### Are existing conventional methods of payment adequate for the purposes of e-commerce?

**No**<sup>35</sup>. Traditional means of payments are not adequate for this type of economic activity. This is particularly true for small transactions (<10 Euros) and micro-payments (<1 Euro)<sup>36, 37</sup>.

**Yes**<sup>38</sup>. A wide variety of locally different payment solutions are available for e-commerce. A widespread international payment solution exists in the form of the credit-card model. Both credit and debit cards can be used remotely and are therefore potential means of making payments across the Internet. Owners of payment cards often indicate that making a card payment across the Internet is no less secure than any other form of remote payment.

**Yes**<sup>39</sup>, **provided certain conditions prevail**. a) the retailer and the consumer are located in the same country; b) the retailer is a known brand and the consumer is a recurring customer; c) it involves B2B e-commerce using EDI.

**Yes, but with additional security measures**<sup>40</sup>. Existing conventional methods of payment such as credit cards and home-banking can be adapted for the purpose of e-commerce. Indeed, some acquirers impose higher security requirements on Internet card use (such as encryption of the card number so that it is not accessible by the trader - or by any 'hackers') than, for example, on the use of cards over the telephone.

Currently, most purchases over the Internet involving U.S. residents are reportedly made by credit card. Several companies, however, are continuing to work on the further development of these payment methods to obtain especially tailored for e-commerce<sup>41</sup>.

**Small (<10 Euros), micro (<1 Euro) and peer-to-peer transactions** appear to be constrained by the lack of a widespread medium of exchange. Instantly verifiable electronic payment solutions **with low transaction costs** are clearly needed. To this end, there are a number of proposed solutions, in

<sup>35</sup> Riksbank Sweden, Svensk Handel, Erste Bank (conventional methods refer primarily to persons, they do not support user groups for private PCs), Leonia Bank (e-commerce demands not met in terms of finality and real-time aspects), M.S.

Manasse-DEC (outside North America and Western Europe credit/debit cards haven't achieved significant penetration)

<sup>36</sup> Sun Microsystems, A. Drapp - Hitachi, G.P. Dwyer Jr. Minoru Saito

<sup>37</sup> According to G. Bannock, an approach which seems to work satisfactorily for making small payments (e.g. <1 Euro) for discreet pieces of information is the payment of an opening balance (say 20 Euros) via credit card, which then gets used up over time. Once the balance is at zero, a fresh charge is made to the credit card.

<sup>38</sup> Danmarks Nationalbank, De Nederlandsche Bank, ESBG, Royal Bank of Scotland, R. L. Field, Ross Anderson, Bertelsmann, R. Holkema, G. Bannock

<sup>39</sup> CartaGo

<sup>40</sup> Deutsche Bundesbank, Bank of England, Deutsche Bank, Den Danske Bank, APACS, Europay, VISA, Interpay, ACE, H.B. Beykirch-Sparkassen IZ, R. Sorieul-UNCITRAL, E. Blot-Lefevre-ECE, C. Senteno-Crescendo

<sup>41</sup> US Federal Reserve System

particular in Europe. Current standardisation and regulatory initiatives may lead to operational schemes<sup>42</sup> (see Chapters 3-5).

**On medium and large value on-line transactions (>10 Euros)** many experts agree that the basic electronic payment systems are already established. Any future changes in the short to medium term will essentially be evolutionary, in particular as far as security features are concerned. Consumers will continue to use credit cards while businesses will continue send money to each other via SWIFT. Some kind of electronic cheque system may also be added..

The **credit/debit card industry**<sup>43</sup> points out that its services have simplified transactions for both merchants and customers. In the past traders were hesitant to accept non-cash payment from consumers whom they did not know, so both parties often negotiated over how payment was to be made. This time-consuming process has been eliminated by the conventional payment card technology currently available. Merchants now accept payment cards from complete strangers without worrying about whether the funds will be delivered into their accounts, and cardholders can use their cards internationally instead of needing to obtain local currency or letters of credit. In this way the big card industries have taken advantage of their role of trusted intermediaries<sup>44</sup> to develop global network infrastructures, unique in size, to deal with transactions. According to reports, this has significantly facilitated commerce, benefiting both consumers and traders.

With the growth of the Internet and its transformation into a commercial trading environment, the card industry has been exploring the opportunities of playing a similar role in the future. Pioneering work in the U.S. found that the existing credit card infrastructure was able to solve a significant portion of the problems encountered on-line.

**According to US experts**<sup>45</sup>, the two main strengths of the existing credit card infrastructure and operating system are (i) its universality; and (ii) its function as an overseer of transactional integrity, coupled with strong legal consumer protections. This second point should not be overlooked, as no other electronic payment system has as yet provided it. Furthermore, US experts believe that credit cards inspire both parties with enough confidence for the fundamental online problem to be overcome: how to get one side to part with something of value without first having received, inspected and confirmed what his counterpart is offering in exchange.

The solution consists of either (a) simultaneous final transfers, or (b) non-simultaneous transfers subject to agreed monitoring of the transaction. Because of the overarching authority of the credit card associations and their banks within the credit card infrastructure, neither party wants to be viewed as too problematic. Accordingly, both recognise that transaction disputes using credit cards are generally self-limiting, and therefore more acceptable from a trust point of view.

Results from experiments by leading technology companies (including Microsoft, IBM and Netscape) to increase on-line security are already available from the major global card companies, VISA and MasterCard. According to VISA, the definition of an open protocol for making secure payments on

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<sup>42</sup> According to the Rabobank, the banks are demanding that new forms of payment must be suitable for insertion in the existing payment structure of over-the-counter payments by debit and credit cards. According to PaySys, the practice of payment systems shows that an account-based open electronic payment system (accounts at different institutions) will generate costs of at least approx. 8 to 10 Euro cent (high volumes after reaching critical mass). So there is obviously no business case for micropayments (<1Euro) in an account-based open system (e.g. between independent cross-border or intranational billing server). Micropayments will only have a chance in closed systems (all accounts at one institution) or as peer-to-peer-transactions (without clearing and settlement and shadow accounts) or aggregated to one amount (microbilling).

<sup>43</sup> VISA

<sup>44</sup> According to Groupe BULL, the intermediation platform can be operated by other players as well, such as telcos, ISPs and banks

<sup>45</sup> R.L. Field

the Internet, called "Secure Electronic Transactions" (SET<sup>46</sup>) represents a key breakthrough. SET's strength lies in the fact that, unlike other encryption technologies, it provides both **encryption and authentication**<sup>47</sup>.

Increasingly, encryption is cited as a critical element in secure electronic payments. One typical perception is that, non-authorised persons can easily intercept payment details. However, experts<sup>48</sup> say that the most significant types of fraud relate to hacker attacks, which penetrate firewalls protecting customer databases on traders' servers. Consequently, not only the encryption of payment details but also the firewall architectures of all transaction parties, including the merchants themselves, are crucial elements. Recent data<sup>49</sup> shows that although only 2% of VISA International's credit card business is in Internet transactions, 50% of its disputes and frauds uncovered relate to that area. According to VISA, disputes over transactions are more common than outright fraud. A common case is when customers deny having ordered goods or services from sites, especially so-called 'brown-wrapper' sites -- those, which, at the customers' request, disguise their identity on credit card statements. Other common consumer complaints include the wrong goods being delivered, late delivery and extra charges.

Experts mostly agree that in addition to encryption, **trust** in the identity of the parties involved in a transaction is essential. To this end, **mutual on-line authentication** is necessary so that:

- cardholders can ensure that a merchant who accepts their particular payment card is a *bona fide* trader;
- merchants can verify whether the customer has a valid card payment account.

Generally speaking, this mutual on-line authentication of the parties to a transaction could reliably be achieved by digital signatures. Indirectly, these also enable a check to be made on the integrity of the information being transferred and establish that a commitment has been by the parties (sometimes called non-repudiation). However, digital signatures do not automatically generate trust between the parties, nor can they guarantee payment. Nonetheless, they do have the potential to add a significant element of confidence to the electronic payment process.

Current debates on the legal background of digital signatures show the extreme complexity of the issue<sup>50</sup>. The level of security offered by digital signatures depends on certification procedures and corresponding infrastructures, which can be very costly and time-consuming, thus slowing down the

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<sup>46</sup> On February 1, 1996, MasterCard International and Visa International, along with others in the industry, announced the development of a single technical specification for safeguarding payment card purchases made over open networks. This specification is called the SET Secure Electronic Transaction™ specification., also known as the SET™ specification. It includes digital certificates - a way of verifying that it is the actual cardholder making the purchase - and will provide financial institutions, merchants, and vendors with a new and safe way of getting the most from the emerging electronic commerce marketplace. On December 19, 1997 SET Secure Electronic Transaction LLC (commonly referred to as "SETCo"), was formed by Visa and MasterCard to implement the recently published SET™ Secure Electronic Transaction 1.0 specification. In addition, a memorandum of understanding has been signed which provides for the addition of American Express and JCB Credit Card Company as co-owners of SETCo. Final agreement on the governing terms of SETCo needs to be complete before JCB and American Express become full members. To this end, final legal agreement is expected. Until that time, MasterCard and Visa are the sole owners and decision makers for SETCo. Further detailed information on SET is available at <http://www.setco.org>

<sup>47</sup> According to the FBE, in respect to SET and the authentication provided, it has to be made clear that this authentication concerns only the card and not the holder. This is especially relevant because ascertaining the identity of the parties involved is essential. In addition merchants have to verify not only that the consumer is who he claims to be but also a valid payment card account holder.

<sup>48</sup> C. Centeno-Crescendo

<sup>49</sup> David Legard: Half of Visa's disputes and fraud result from Internet commerce, InfoWorld Electric, 24 March 1999,

<sup>50</sup> Copenhagen Hearing (April 1998), proposed Directive COM(1998)297final.

transaction process. Nevertheless, for authentication purposes VISA and SET rely on digital signatures.

Many experts in the card industry are optimistic about the future of SET or SET-like standardisation. After the roll-out of the SET payment system in America and in most European countries and an intensified promotion of this system by banks and credit card organisations, public confidence in safe payment systems is predicted to grow<sup>51</sup>.

Nevertheless, there is also substantial scepticism about SET<sup>52, 53, 54</sup>. In its introductory phase, not much value was added (the merchants already had access to credit card numbers for MOTO<sup>55</sup> and wanted this to continue, as they used the numbers as marketing database keys). The upshot is that SET has not been implemented<sup>56</sup>. Furthermore, some participants believe that SET is failing simply because "successful" shopping experiences already exist, and security (128 bit SSL) is perceived as good enough<sup>57</sup> already.

In the U.S., federal law provides consumers with strong legal protection in the event of fraudulent use of a credit card. Accordingly, it is felt<sup>58</sup> that consumers there have no real or direct need for new systems which provide greater non-repudiation security (e.g. SET). Indeed, US consumers may be sceptical about using digital signature arrangements or e-cash systems that promise transaction non-repudiation, since they may have significantly less legal protection in the event of fraud when using unregulated systems.

According to the EC-ISGNM, specialists should be asked more specific questions. For instance, in the trade in the distribution sector, **the merchant fee** levied on the trader by the acquiring bank has a deterrent impact in some cases; i.e., some merchants refuse to accept card schemes when high

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<sup>51</sup> Interpay, Den Danske Bank, Alpha Credit Bank, Lufthansa

<sup>52</sup> for example according to the Erste Bank solutions like SET are at present too complex to be easily installed and understood by the broad majority of private users; according to Sistema 4B, solutions such as SET are expensive and do not meet all users' needs

<sup>53</sup> According to Anne & Lynn Wheeler, experts in the USA currently see several deficiencies with regard to SET, which has led to the work in ANSI X9 on the X9.59 payment standard (and Account Authority Digital Signatures, AADS). Further work has indicated that X9.59 coupled with the appropriate chipcard can not only reduce the cost of electronic commerce but also the point-of-sale costs (using a single, common transaction standard and infrastructure). Furthermore this represents an incremental evaluation of the existing business processes. A new work item in X9 will look at the feasibility of retrofitting AADS authentication to all kinds of existing financial transactions. There is also work regarding the parameterised risk management for AADS-based transactions; i.e. to take into account the assurance levels of the various transaction components, along with the value of the transaction and other factors when evaluating authorisation of the transaction and the associated risk. A standardised parameterised risk model for electronic payments is less likely to have unanticipated system risks and fraudulent methods. Pointers to information on X9.59 and AADS can be found at: <http://www.garlic.com/~lynn/>

<sup>54</sup> According to A. Drapp-Hitachi, SET is expensive for merchants to implement, thus there needs to be a financial incentive. Receiving and registering SET certificates on the consumer side has been shown to be problematic. Consumers have been reluctant to register for SET certificates for a variety of reasons. These include: a) time-consuming for the consumer: it is much simpler and convenient just to enter a credit card number in a web form and transmit it over SSL. b) Lack of computer literacy: registering a SET certificate may be beyond the abilities of some users. More appropriately, it is beyond the comfort zone of some consumers. However, if acquirers were to implement a stronger pricing policy, SET could become the dominant method for credit card transactions. An appropriate policy would be to offer a merchant fee for SET-based transactions that is similar or equal to present card transactions. If the trader could save several percent on the merchant fees, there would be a strong financial incentive to implement SET. Furthermore, if some of those savings were passed on to the consumer, and consumers were given a discount if they used SET, there would be a strong consumer-driven demand to register and use SET.

<sup>55</sup> Mail Order, Telephone Order

<sup>56</sup> Ross Anderson

<sup>57</sup> R. Bass- Intuit

<sup>58</sup> R. F. Field

merchant fees are levied. With the use of the Internet, will card operators<sup>59</sup> be in a position to levy the same level of fees on merchants, given the fact that electronic transactions are much more cost-efficient and, on top of that, given the fact that exchange risks have disappeared in the Euro-zone?

In conclusion, more efficient forms of online payment are likely to evolve, but at this point few if any experts can predict what they might be. It is instructive that most of the new products introduced to date have failed to prove themselves in the market.

### 1.3 Awareness of risks in payment methods

**What is the role played by company and customer awareness of risks in the acceptance of both secured and unsecured methods of payment?**

**Security, legal certainty and trust** are important elements, influencing the acceptance of e-commerce by both individuals and businesses. Furthermore, sociological and cost factors play a significant role<sup>60</sup>.

Several reports on awareness of risks are related to the non-transparent legal background for both companies and consumers. In this context, e-commerce reluctance appears to be more pronounced in firms than in customers<sup>61</sup>. The main reason for firms to be reluctant may be insecurity caused by the lack of legal rules determining when a transaction is legally binding. For customers, in addition to this, the security of on-line payment methods may be decisive. An important issue is credit card acceptance by retailers in Europe. The credit cards were offered to merchants originally on the grounds, that authorised transactions would be honoured. Now the system is established, banks in some countries charge traders for fraudulent transactions, which causes tensions<sup>62</sup>. Some large retailers still refuse to take credit cards because of the terms of business (in the UK, Marks and Spencer and the John Lewis partnership). The result has been a move towards debit cards - which use the same infrastructure but have different contractual terms.

In general, there seems to be no consensus on whether companies and customers clearly distinguish between secured and unsecured methods of payment and whether they would not accept the latter because of the risks involved.

Some parties believe that companies and customers clearly distinguish<sup>63</sup> between secured and unsecured methods. However, others maintain<sup>64</sup> that only companies clearly distinguish between secured and unsecured methods. Customers' awareness of risks on the other hand is most probably based on perception rather than on facts, and is therefore less analytical. If both partners in e-commerce (banks and merchants) are reliable and offer convenient payment schemes, customers will make use of them.

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<sup>59</sup> According to FBE, card operators will not be generally in a position to reduce fees because of the huge investments needed.

<sup>60</sup> ESBG

<sup>61</sup> A. Prinz, C. Centeno-Crescendo

<sup>62</sup> Ross Anderson

<sup>63</sup> Deutsche Bundesbank

<sup>64</sup> Deutsche Bank, Ross Anderson, C. Centeno-Crescendo

There is also an opinion<sup>65</sup> from the US that sellers have traditionally shown themselves to be willing to risk using somewhat insecure payments systems in many instances, so long as their resulting losses can be compensated for in other ways.

**The general public remains unaware of the risk issue<sup>66</sup>.** The main concern of the average consumer seems to be confidentiality about credit card numbers exchanged on the Internet. Some experts<sup>67</sup> share the view that the perceived lack of security in on-line electronic payments is largely exaggerated and not justified at all by the actual threat. The average consumer does not yet realise that the risk of compromising his card number is far greater in conventional face-to-face transactions than on the Internet. This is partly the result of ignorance and unfamiliarity, as well as a mistaken belief in the security of traditional payment systems<sup>68</sup>. In this respect, the difficulty of generalising about the security aspects of all systems should be stressed. There is a wide variety of payment systems with different security features and thus with varying security levels<sup>69</sup>.

Many other issues affect the security of electronic payments perhaps even more importantly: e.g. the physical, procedural and personnel security procedures operated at the ends of any telecommunications link (whether via a PC, smart card or mobile phone). It is also fairly well known that most security failures are caused by "insider" threats rather than by external hackers (or crackers). Confidence in the reliable operation of the terminal equipment(s) is essential.

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<sup>65</sup> R.L. Field

<sup>66</sup> Erste Bank

<sup>67</sup> David Herson, Fintel

<sup>68</sup> There are numerous well-documented cases about the vulnerability of conventional security systems such as the ATMs

<sup>69</sup> ECB

## 1.4 Cost-effectiveness criteria for the adoption of achievable security levels

### What are the criteria for the adoption of various levels of cost-effectiveness and security currently achievable by payment systems?

**Adequate and reliable security never comes cheap**<sup>70</sup>. Highly secure procedures are frequently time-consuming and sometimes complex. At the other extreme, a false show of security is potentially more damaging than no security at all.

Besides cost, other reported<sup>71</sup> criteria for the adoption of payment systems are related to legal certainty over the **authenticity** of transactions, data integrity and data confidence, and anonymity.

The security level of electronic payment systems depends on the level of cryptographic technology and the cost of developing it. An extremely secure system could be created but might give rise to low-performance transactions and high costs for development, communication, and equipment. As a result, such a system would be rarely used. On the other hand, by reducing the security level somewhat, it would be possible to develop a low-cost, high-performance system, but users might be nervous about the security of the system and hesitate to use it. Consequently, the security level of electronic payment systems will need to be a trade-off between the security demands of users and the cost of realising these.

As far as the lack of payment instruments for medium and large value on-line transactions (>10 Euros) is concerned, systems with scalable security requirements and correspondingly variable transaction costs could be designed<sup>72</sup>. A requirement for structured levels of security could be extended globally to all types of mass electronic payment systems<sup>73</sup>.

Today there are several achievable levels of security and cost-effectiveness for electronic payment systems:

- no security
- simple security (e. g SSL - Secure Socket Layer)
- EDIFACT<sup>74</sup>
- SET.

On the question of how much security is enough, several answers maintain: "at least 128-bit encryption without key escrow is critical<sup>75</sup>".

<sup>70</sup> David Herson

<sup>71</sup> Deutsche Bundesbank, ESBG

<sup>72</sup> G.P. Dwyer Jr.

<sup>73</sup> Erste Bank

<sup>74</sup> According to IC Focus, the cost-effectiveness of using EDIFACT to provide application-level security is yet to be proven. In this respect, it is felt that yet there are real implementation experiences with the latest version of the EDIFACT syntax (Version 4), which incorporates security figures.

<sup>75</sup> R. Bass-Intuit

Encryption can solve problems related to confidentiality issues of sensitive information, but not issues related to user authentication. Technically this can be solved by smart cards based on RSA<sup>76</sup> but from the legal point of view there are major barriers to be tackled. According to some parties<sup>77, 78</sup> in this respect a major question centres on the feasibility of the conception of a European Authority for registering the different security levels and mechanisms. It could classify these in terms of merchant and consumer guarantees that would be recognisable by different providers of payment point access.

In conclusion, despite the substantial experience gained through security implementations conducted to date, it is still difficult to ascertain the current and future security demands by users<sup>79</sup> and their willingness to pay for increased security. In this respect the major challenge appears to be<sup>80</sup> :

- assessing the real risk that each technology option carries;
- selecting the appropriate technology options;
- designating who will bear the costs in case of fraud.

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<sup>76</sup> RSA (Rivest-Shamir-Adelman) is the most commonly used public key algorithm

<sup>77</sup> Groupe BULL

<sup>78</sup> FBE strongly questions the feasibility of establishing such an authority at EU level

<sup>79</sup> NTT

<sup>80</sup> C. Centeno-Crescendo

## 1.5 Unresolved security and regulatory issues

### Does the rapid spread of e-commerce depend largely on unresolved security and regulatory issues?

**No<sup>81</sup>, there are other barriers.** It is a psychological issue<sup>82</sup>. The major impediment is within trading companies and their service providers<sup>83</sup>.

**Yes<sup>84</sup>, in particular in the EU.** Inconsistent and unrealistic national laws on cryptography technologies and content regulations are definite barriers to EC<sup>85</sup>.

**Partly.** EU consumers using remote banking services enjoy less legal protection than their US counterparts<sup>86</sup>.

**Legal certainty in electronic marketplaces<sup>87, 88</sup>,** particularly in a cross-border and cross-jurisdictional environment, is not yet sufficiently established either within the European Union or on a global scale. It concerns the validity and recognition of electronic contracts, the rules for the involvement of trusted third parties and the question of applicable legislation in electronic cross-border transactions.

There might be a more rapid spread of e-commerce if safe and regulated payment systems were available on a national and international level<sup>89</sup>. In particular, customer confidence could be built most rapidly if customer liability were limited, as is the case in the USA. In fact the USA's main advantage over the EU is the EFT Act and Regulation E, which limit customer credit card losses to \$50. Here there is a much stronger case for government action. It is suggested<sup>90</sup> that the EU needs a directive comparable to Regulation E, otherwise it will be at a competitive disadvantage, and the growth of e-commerce here will be hampered in comparison to the USA.

An important short-term legal and regulator barrier is the **lack of recognition of electronic contracts<sup>91</sup>**. This relates to the 'ease of adoption' issue – if customers can adopt and use a service or

<sup>81</sup> Sun Microsystems

<sup>82</sup> ACE,

<sup>83</sup> I. Grigg

<sup>84</sup> ESBG, Deutsche Bank, A. Prinz, C. Centeno-Crescendo, A. Weber

<sup>85</sup> META Group (there are many known cases where companies hesitate to do cross-border business in Europe, and avoid France and Germany completely because of unworkable laws).

<sup>86</sup> DGXXIV

<sup>87</sup> According to the Danmarks Nationalbank the Danish legislation on retail payment systems limits the liability for holders of electronic payment devices, thus ensuring confidence for holders of electronic payment devices. However, until recently, it was illegal for issuers of payment systems to charge working expenses on acceptors of payments via the Internet. *Ceteris paribus* this disincentive for issuers has hampered the development of electronic commerce via the Internet.

<sup>88</sup> Many experts and players suggest that the EU should analyse the US situation more closely

<sup>89</sup> Deutsche Bundesbank

<sup>90</sup> Ross Anderson

<sup>91</sup> R. Bass-Intuit

technology by clicking a button 'I Accept' on a web page, many more will adopt it than if paper signatures are still required. Contract terms should mostly emerge from the market, but EU efforts analogous to the US Uniform Commercial Code (UCC) are important. However, this should not preempt market-testing of business practices, for example by imposing excessive consumer protection costs that slow adoption and growth. Since e-commerce is global, and the US market undeniably is ahead of the European one, EU initiatives here should maintain compatibility with US frameworks.

Another key unresolved regulatory issue is on the related issues of **encryption and trust**. The relationship to trust is simply that if signature keys are escrowed (and it is hard to separate encryption and signature keys legally), then signatures cannot be relied upon. This is less of a short-term inhibitor, except perhaps in France, with its more rigid encryption regime, but will be important in the future as certificate infrastructures develop. Another class of regulatory barriers is national requirements that increase the costs of selling electronically on a pan-European basis, such as taxes, licences, etc.

On the other hand, some parties report that regulation over-emphasising the security of the system would hamper the growth of e-commerce<sup>92</sup>. An example is the very early legislative intervention in Germany, where the sixth amendment of the Kreditwesengesetz (German Law on credit matters) on the one hand is reported<sup>93</sup> to be hindering market adoption and innovation. In this context, it is believed<sup>94</sup> that legislation on digital signatures should be designed to further the growth of international e-commerce, regulating the use of digital signatures only when this is strictly necessary<sup>95</sup>. This will strongly support the roll-out of SET, the growth of public trust in electronic payment systems and the growth of e-commerce<sup>96</sup>.

Other reported regulatory barriers refer to intellectual property rights and to VAT export/import conditions.

For consumers and companies, the main policy implications can be summarised as follows:

- they seem to need more security, in both technical and legal terms
- they seem to need more transparency and information about the real risks connected with on-line transactions.

In conclusion, a legal EU-wide framework needs to be established. Accordingly the EC is currently proposing a Directive on certain legal aspects of e-commerce in the internal market<sup>97</sup>.

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<sup>92</sup> NTT, EC-ISGNM

<sup>93</sup> Deutsche Bank

<sup>94</sup> VISA, C. Centeno-Crescendo

<sup>95</sup> For example according to the Erste Bank, Digital Signature implementations should only address the high end e-business but not affect the broad ATM and EFTPOS credit or debit systems.

<sup>96</sup> Interpay

<sup>97</sup> E-commerce: Commission proposes a legal framework. See: <http://europa.eu.int/comm/dg15/en/media/eleccomm/999.htm>

## 2. Monetary Union and Cross-Border Electronic Commerce

### Will monetary union speed up cross-border e-commerce within the EU and worldwide?

Before this question is answered, priority is given to views from abroad.

**From the U.S. perspective**, the introduction of a single currency through the EMU may have a positive impact on the growth of e-commerce. In particular, more cross-border payments can be expected, as in the United States and Canada where nowadays a single currency is possible. The retail purchasing experience is about the same size as a face-to-face credit card transaction, while utility payments tend to be somewhat larger in Europe<sup>98</sup>.

Doubt is cast on the perception that the lack of common currencies has posed a significant barrier to the expansion of cross-border e-commerce. The existence of multiple currencies may make product comparisons more difficult, but the currency conversion itself is simplified through the use of credit or debit cards to pay for goods and services<sup>99</sup>.

According to another U.S. point of view<sup>100</sup>, the crucial issue is the lack of common, harmonised regulations, which hampers cross-border commerce. Until recently, most merchants in the U.S. would not accept orders from outside the country. European traders have, by the nature of their market, been more progressive in the acceptance of cross-border payments. In this light, the introduction of the Euro should greatly enhance cross-border payments. It will probably take several years to have its full effect on cross-border payments within Europe, as well as on international purchases from Europe by consumers in other regions of the world. However, the ability to trade in a smaller number of currencies eliminates a large drag of the settlement of payments, and will create more efficient and transparent pricing. Both small consumer payments and large corporate transactions should be facilitated by the introduction of the Euro.

**The Japanese viewpoint** is that it is preferable for only one currency to be used for payment in e-commerce. However, the *status quo* of many different nations in respect of their own sovereignty makes it unlikely that they will easily accept that only one currency can be used for payment. In this light, the development of the Euro concept is a remarkable effort, because it tries to reduce such barriers<sup>101</sup>.

A further surmise<sup>102</sup> is that monetary union will initially slow down e-commerce due to the costs of system modifications, but that it will immediately enable some applications and ultimately speed up

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<sup>98</sup> Cybercash

<sup>99</sup> US Federal Reserve System

<sup>100</sup> S. Smith-CurrentAnalysis

<sup>101</sup> NTT

<sup>102</sup> R.L. Field

cross-border commerce generally. Of course, this is subject to many other considerations, including legal and jurisdictional harmonisation, consistent tax policies, etc.

At present, the majority of cross-border Internet transactions are with the US, where most on-line companies are based. This is believed to be the case at least in the UK and probably for the rest of Europe as well.

Some views state that the EMU will contribute greatly to an increase in cross-border e-commerce. However, in general, expectations tend to be rather modest. EMU may have a certain impact on the growth of e-commerce to the extent that the Internet and other electronic communication channels help individuals and businesses in their search for new trade partners abroad and support them in price comparisons. However, the effect of EMU on e-commerce is not believed to go beyond the "normal" growth effect of EMU<sup>103</sup>. The ability to compare prices across borders and the elimination of currency risks will induce more and more market participants to expand their economic activities beyond national borders.

The third stage<sup>104</sup> of EMU will certainly have a positive effect on e-commerce and vice versa.

The overall growth potential of e-commerce appears to hinge to a greater degree on system-specific technological improvements, the depth and breadth of online product offerings, marketing efforts, and general consumer access and familiarity. Also, differences in shipping and handling costs and tax rates will continue to influence the pattern of cross-border e-commerce<sup>105</sup>. Some parties in the UK reported they would be surprised if there were a considerable increase in commerce following the introduction of the Euro, especially in the short term. As noted in the previous chapter, the infrastructure to support a surge in e-commerce is not in place in Europe and the time-lag involved in doing this will mean that the introduction of the Euro is unlikely to have an immediate effect. This applies in particular to the issue of standardisation of payment systems<sup>106</sup>. In this context, it is conceivable that the application of adequate security standards to cross border payments may help eliminate a number of current security concerns.

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<sup>103</sup> ESBG

<sup>104</sup> VISA, Interpay

<sup>105</sup> US Federal Reserve System

<sup>106</sup> Deutsche Bundesbank, Riksbank Sweden, US Federal Reserve System

## 2.1 Current size of cross-border payments, constraints and prospects for e-commerce in the EU

### What is known about the current size of cross-border payments?

In general, most experts agree that there is no exact information on low-value cross-border payments with respect to e-commerce.

According to some available quantitative estimation, cross-border payments represent a very small proportion of total (domestic plus cross-border) payments, probably under 2%. Even if the growth were rapid (which may not happen), cross-border payments would continue to constitute only a small proportion of total payments for some time<sup>107</sup>.

### Has the lack of a common currency been a major constraint on the development of cross-border e-commerce?

**No**<sup>108</sup>. The impact will not be significant. It has not been the case in traditional commerce and it will not be in e-commerce. Ironically, the biggest e-commerce growth is coming from the UK, which is not in the Euro zone.

### Will the introduction of the Euro consequently lead to a surge of such commerce?

The introduction of the Euro will probably lead to a **moderately wider spread of cross-border payments and e-commerce in Europe**<sup>109</sup>. This is because there will no longer be exchange rate risks from the beginning of 1999 and fees for the exchange of currencies will be cancelled in 2002. Furthermore, prices denominated in Euro will promote transparency of national markets and thus enhance competition between retailers. This European development may also support an increase of e-commerce worldwide.

- Respondents to the IPTS survey felt that it was hard to isolate this event from other events in the marketplace<sup>110</sup>. These may include a lowering of the prices for computers and Internet connections

<sup>107</sup> APACS, Royal Bank of Scotland, E. Alyanikian

<sup>108</sup> Banco Central De Reserva Del Peru, Deutsche Bank, Swiss Bankers Association, Royal Bank of Scotland, Rabobank, H.B. Beykirch-Sparkassen IZ, AIB Bank, Alpha Credit Bank, C. Centeno - Crescendo, H. Konstapel, S. Gazziano-ENEA, Svensk Handel

<sup>109</sup> Deutsche Bundesbank, Deutsche Bank, Banco de Portugal, Banco Central De Reserva Del Peru, Europay, Sistema 4B, Swiss Bankers Association, Cera Bank, Den Danske Bank, Leonia Bank, APACS, Royal Bank of Scotland, Erste Bank, NTT, Intuit, E. Alyanikian, D. Bartmann-IBI, E. Blot-Lefevre-ECE (trans-border exchanges will develop immensely), Lufthansa, Svensk Handel

<sup>110</sup> De Nederlandsche Bank

(due to the liberalisation of markets and lower telecom fees). They may also be responsible for speeding up e-commerce by increasing the consumer base. Cross-border payments are likely to be an issue more for businesses than for consumers, since credit/debit cards are already widely used by consumers and function internationally<sup>111</sup>. Cross-border e-commerce within the EU is more likely to remain limited<sup>112</sup>.

Reported factors, barriers and perceptions likely to influence the development of cross-border e-commerce in synergy with the introduction of the Euro, are as follows:

- Within the EU the single currency will enhance the transparency of markets, eliminate conversion costs and exchange rate risks within Europe and facilitate cross-border price comparisons, acceptance, processing and clearing of transactions.<sup>113</sup> The potential markets and customer base for these services will increase, making it easier to achieve sufficiently large trade volumes<sup>114</sup>, and companies may more easily decide to enter the EU market. It therefore seems likely that the Euro will have some positive effect on e-commerce within the EU.<sup>115</sup> However according to opinions from the UK, the exchange rate risk will remain a feature of Internet transactions with the US, even following the introduction of the Euro.
- The actual implementation of the Euro is much easier in an electronic environment than in the physical world.<sup>116</sup>
- The fact that the Euro is not available in physical form until 2002 will have an additional advantage for e-commerce, where any currency is virtual.<sup>117</sup>
- An important issue will be the real cost of cross-border transactions for consumers. Broad acceptance depends on this cost being close to 0%.<sup>118</sup>
- In addition to the single currency, one important condition for a surge in e-commerce is the creation of common standards to enable interoperability between electronic payment systems developed in different countries.<sup>119</sup>
- The “confidence dilemma” is not solved by the introduction of a single currency, and arguably many significant problems in e-commerce are not due to the lack of a single currency. This makes it unlikely that its arrival will bring a major surge in e-commerce.<sup>120</sup>
- For consumers, cross-border trade indicates additional consumer protection risks compared to domestic trade, e.g. because of differences in consumer protection legislation between countries.
- Electronic purses are expected to play an important role in supporting the 2002 cash changeover.<sup>121</sup>

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<sup>111</sup> R. Bass-Intuit, S. Gazziano-ENEA

<sup>112</sup> Danmarks Nationalbank, ESBG, Ross Anderson, Intuit

<sup>113</sup> Deutsche Bank

<sup>114</sup> Bank of Finland, ESBG

<sup>115</sup> Deutsche Bundesbank, Danmarks Nationalbank, Bank of Finland, Riksbank, Sweden, De Nederlandsche Bank, ESBG, Deutsche Bank, VISA, Interpay, Ross Anderson, Bank of Finland, APACS

<sup>116</sup> VISA

<sup>117</sup> Banco de Portugal, VISA

<sup>118</sup> K.H. Achinger-debis

<sup>119</sup> Riksbank, Sweden, ESBG

<sup>120</sup> Danmarks Nationalbank, Bank of Finland

<sup>121</sup> ESBG

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- There is no business case for cross-border low-value payments<sup>122</sup> with a card-based e-purse like GeldKarte or other accountable schemes. According to Paysys, the key question is "Why should bank issuers subsidise a cross-border e-purse-scheme for a long period against a competitor with 2,500 years of market dominance, which is unbeatable and empowered by the entrance of Euro cash? Without market regulation or compulsion, Euro conversion of cash in 2002 will weaken the card-based e-money like GeldKarte, Proton, etc. as a retail payment instrument?". Technical interoperability by CEPS (*Common Electronic Purse Standard*) is not a magic solution. Euro cash will prevail. The chances of e-money becoming a network currency are much higher because there is no competition in the Internet from traditional cash.

A recent survey by Price Waterhouse Coopers investigating the attitudes of European CEOs found 55% believed growth in cross-border e-commerce depended on global standards for privacy, security and authentication. Attitudes vary nationally, with 23% of UK CEOs believing that the Internet would account for 20% of revenue by 2004. This contrasts sharply with the 6% of German CEOs foreseeing this extent of e-commerce growth.

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<sup>122</sup> PaySys

## 2.2 Promising areas for e-commerce in products and services

### **For which types of products and services in particular do you expect cross-border e-commerce to increase?**

With many products or services the domestic market will continue to be the main source of trade for some time, because of logistics, brand awareness, after-sales service, national tastes and customs, etc.

Cross-border e-commerce is most likely to grow in product sectors where shipping costs are small compared to value, and in services where technology can substantially change the value proposition or economics, provided national regulations do not create barriers<sup>123</sup>. In the US, leading consumer sectors have included financial services (especially investment management/online trading), books, music and travel. In the business-to-business sector, the large-scale move towards e-commerce will start with companies moving their existing customers to electronic ordering. These may be in technology-related sectors – companies such as Cisco and Intel take billions of dollars a year in orders over their web-site. Such companies are then likely to use this infrastructure, and their cost advantages, to compete better with incumbents in other national markets.

In conclusion, cross-border e-commerce is expected to increase in the trade of the following types of products and services:

- non-physical goods such as software, information, music, etc.
- standardised consumer durable goods<sup>124, 125</sup>, such as books
- new types of services, such as telecommunications, Internet access, mobile services, etc.
- financial services such as loans, insurance, deposits and investment. Differences between Member States are significant in price and performance. With unified interest rates, the incentive may exist for some large players to make the necessary infrastructure investment (from multilingual call centres through relations with credit reference agencies, etc) to support pan-European operations. (Many of these players may be US firms like Citigroup);
- airline industry services<sup>126</sup>, the car rental, entertainment, hospitality and travel industries, and corporate procurement<sup>127</sup>. Here EMU will have significant impact on pricing policies, and the on-line acquisition of products is gaining significant momentum. Convenient on-line retrieval of best prices and other additional loyalty policies offer fertile ground for important e-commerce growth.

<sup>123</sup> R. Bass-Intuit,

<sup>124</sup> K.H Achinger-debis: in particular those with low logistics costs

<sup>125</sup> According to IC Focus, an increase in cross-border e-commerce is often linked to a new kind of third party service, the business model of which is driven by information brokering. For example, the success of Amazon.com and its added value for the consumer results from information brokering.

<sup>126</sup> According to Lufthansa, a major current issue for the air transportation industry consists in analysing the prospects of cross-border on-line sales.

<sup>127</sup> CartaGo

### 3. The cost of non-standardisation

#### What are the costs of non-standardisation of e-payment systems?

Throughout history, new technological developments have led to expanded forms of commerce. In turn, the new commercial needs have resulted in new forms of payment. Arguably, the invention of a trusted third party payment mechanism over 500 years ago was a more significant payment system development, compared to anything being seen today. However, it is important to note that the old forms of payment do not disappear but instead are enhanced by the new forms and enable a richer variety of commerce. Nowadays we see barter, cash, checks, wire transfers, credit cards, etc. Each has developed its niche, small or large, and the elimination of any form would itself hamper commerce<sup>128</sup>.

There has been a proliferation of electronic purses programs over the past few years, which has resulted in many non-interoperable proprietary systems. The costs of their non-standardisation can be compared to the costs of an inefficient Internal Market<sup>129</sup> and some participants are convinced that standardisation could lower them<sup>130</sup>. Experiences in Norway offer a good example highlighting this. Several systems co-existed in the 80s and the costs of terminals required to support the different standards sky-rocketed. At the time terminal prices in Norway were ten times more expensive than in France<sup>131</sup>.

The apparent need for scaleable solutions, international usage (the Euro), and for cost-effective ways of implementing programs, underlines the importance of global interoperability specifications. In this respect, several parties<sup>132</sup> stress that interoperability is far more important than standardisation. Many<sup>133</sup> feel that standardisation is a means of achieving interoperability. In addition, others perceive the necessity of distinguishing between technical interoperability and system interoperability<sup>134</sup>. Technical interoperability means that a card or chip can be read by a terminal of another payment system. Terminals of merchants who only accept Eurocard (and not Visa) can read the magnetic stripe of every Visa card. In this case there is technical but not system interoperability. To establish system interoperability in card payment systems there is a need for overhead systems, central rules and regulations, and a clearing and settlement mechanism (e.g. Europay or Visa International).

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<sup>128</sup> R.L. Field

<sup>129</sup> Europay

<sup>130</sup> Interpay

<sup>131</sup> CartaGO

<sup>132</sup> U.S. Federal Reserve, R. Bass-Intuit, C. Centeno-Crescendo

<sup>133</sup> IC Focus

<sup>134</sup> PaySys

### 3.1 The need for standardisation

The necessity for standardising electronic payment systems cannot be taken for granted.

Some advantages and disadvantages of standardisation<sup>135</sup>:

Pro

Technically efficient  
 Improved understanding  
 Common understanding  
 Lower risk of error  
 Lower cost

Con

Lowest common denominator  
 Difficult to change  
 Hard to innovate  
 Conflicts over access  
 Conflicts over control

Standardisation can apply to various aspects of the electronic payment process. Some may be essential, other may be desirable and some may be counterproductive:

- Process standardisation: this describes a model of responsibilities and liabilities of the various role players in the distributed process (payer, merchant, acquirer, issuer,...). Standardisation (*de jure*) or even regulation in this field is absolutely essential. For example, the credit card model has defined rules based on national structures<sup>136</sup>.
- Data standardisation: also essential, but could be slow to emerge spontaneously. A good example is the standard bank account numbering scheme IBAN, which is proving slow to be adopted. Not standardising data, which needs to be interchanged is often counterproductive.
- Standardisation to stimulate competition of technology providers.

Currently in e-commerce we are seeing a process of experimentation, as many existing forms of commerce seek to find their place on-line, creating new forms in the process. It is likely that different forms of online commerce will develop distinct approaches to payment. Despite the obvious incentives, the effect of arbitrarily standardising one form of payment at this stage, before the commerce applications are even known<sup>137</sup>, would seem to be unwise when viewed from a historical perspective. In the same context, a proactive view<sup>138</sup> is that standardisation is not only needed for

<sup>135</sup> Reserve Bank of New Zealand

<sup>136</sup> Fintel: e.g. merchant and acquirer must be in the same member state; this kind of industry *de facto* standardisation may affect the development of e-commerce.

<sup>137</sup> R.L. Field

<sup>138</sup> According to H. B. Beykirch-Sparkassen IZ and Andrew Drapp-Hitachi, the emerging International OTP Standard does this. The Open Trading Protocol was developed by a number of organisations, working co-operatively to make widespread Internet trading a convenient and secure reality. OTP is a protocol for the development of software products that will permit product interoperability for the electronic purchase that is independent of the chosen payment mechanism -- OTP encapsulates the payment with the offers/invoice/receipts for payment and delivery. It has brought together: a) Internet, b) electronic payment schemes, and c) interoperable trading for offer/invoice/payment and delivery receipt. Further information is available at <http://www.otp.org>. Continued development of the OTP protocol is now under the authority of the IETF (Internet Engineering Task Force), and it has been renamed IOTP (Internet Open Trading Protocol).

payment systems, but for the whole business case, starting with the negotiation of trading parameters, offer, order, payment and delivery.

Standardisation of payment systems is, per definition<sup>139, 140</sup> a desirable aim, because of economies of scale and transparency, among other things. In the case of conventional payment methods, there is evidence that standardisation and interoperability have given payments with cards a significant boost<sup>141</sup>. Following this line, once new payment systems are made available they will inevitably become standardised<sup>142</sup>, because externalities are so important.

Basically the dilemma is over when a standard should be adopted<sup>143</sup>. Extreme situations both of enormous cost or significant economic benefits are possible in the case of early standardisation:

- enormous costs can occur when standardisation is premature and insufficiently flexible,
- a number of benefits are possible if a product is standardised at an early stage of development, including:
  - ◆ reduced production costs
  - ◆ certainty for commercial operations and a stable basis for further developments
  - ◆ additional advantages to users through network externalities
  - ◆ beneficial competition effects for users, as producers must compete directly with prices and performance instead of with technical characteristics.

Some parties perceive that in order to increase efficiency the objective should be to have an adequate solution working quickly<sup>144</sup>. The reported reasons are complex and refer to the need to respond through interoperable solutions to fast-changing customer preferences.

On the other hand, a later standard benefits from more advanced technology. In addition, once a standard is adopted, the industry is likely to move to another standard only very reluctantly, as there are significant sunk costs related to the previous standard. Thus it is crucial whether the stage of current technological development is considered mature enough to justify a standard, as adopting a standard too early is likely to bind users and producers to inadequate technology in the long run. This would imply additional social costs.

In conclusion, the question of who should pay the extra cost to realise interoperability among non-standardised systems is difficult to answer and represents a key issue<sup>145</sup>.

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<sup>139</sup> Danmarks Nationalbank

<sup>140</sup> When studying the costs and benefits of standardisation, it is also important to point out that a technical specification needs to be distinguished from a standard

<sup>141</sup> CartaGO

<sup>142</sup> Ross Anderson

<sup>143</sup> Bank of Finland, APACS

<sup>144</sup> R. Bass-Intuit: in reality, it is typically unclear who the customer group is, and what the needs or priorities are.

<sup>145</sup> NTT

## 3.2 The co-existence of different payment systems

**If electronic payment follows the credit-card model, several payment systems might be expected to co-exist. How likely is such a scenario?**

The allusion to the "credit card model" elicited interesting interpretations.

There is a pronounced tendency to believe that the card industry, where many different competing products co-exist, each one with slightly different characteristics, represents an interesting solution<sup>146</sup>. In this respect, competition between the two global networks (Visa and Europay/Mastercard) is found to be beneficial<sup>147</sup> to consumers and retailers.

Some experts<sup>148</sup> see the credit card model as a single system consisting of several brands<sup>149</sup>. The messaging protocols, card formats etc for VISA and Mastercard are essentially identical. Processing is shared. Both cards can be used at almost all outlets that will take either of them, and acquiring banks process transactions of both brands.

However, there are different ways of looking at the credit card model. First, there is a view that the current situation suffers<sup>150</sup> from different regulatory conditions. Second, as far as future developments are concerned, other parties<sup>151</sup> claim that the credit card model is not the simplest one, because it involves not only banks but also credit card organisations. Basically, the credit card model creates "trust circles" i.e. it creates a network amongst the members of a circle where buyers, sellers and other third parties participate in raising the level of trust in the circle. Non-standardisation entails many circles in which buyers or sellers must become members if any buyer is to be able to buy from any seller. New membership in a circle incurs increased costs. Hence the minimal community cost is reached with only one trust circle for the whole community (meaning a standard one). Inevitably, competition is leading to more circles.

Most of the survey respondents expect that in future several competing electronic payment systems will co-exist<sup>152</sup>. This is because users want different types of payment instruments for different kinds of transactions. In the light of the needs of customers, retailers and banks, the demand for different instruments and their widespread acceptance is affected by factors such as:

- the regularity of the payment
- time of the payment (prepaid, pay now, postpaid)
- scalability
- security
- anonymity
- efficiency
- interoperability among banks and terminals
- the payment amount

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<sup>146</sup> E. Alyanakian

<sup>147</sup> APACS

<sup>148</sup> Ross Anderson

<sup>149</sup> According to PaySys, today there is no system interoperability between Eurocard/MasterCard and Visa although there are no basic technical restrictions.

<sup>150</sup> Deutsche Bank

<sup>151</sup> Fintel

<sup>152</sup> De Nederlandsche Bank, Riksbank Sweden, Cera Bank, Royal Bank of Scotland, Interpay, Intuit, P. Janson -IBM, C. Centeno-Crescendo, S. Smith-CurrentAnalysis, D. Bartmann-IBI, G.P Dwyer Jr., M. Escher, La Caixa

- the distance to the recipient of the payment (including cross-border capability)
- the need for payment records
- user-friendliness and retailer acceptance of electronic payment systems.

Although any standardisation by market participants other than voluntary is unnecessary, some initiatives of the European Commission may result in some Commission-funded standard-setting or trial projects which are more relevant from a political or a general perception point of view than from a market one<sup>153</sup>.

In order to be efficient, more effective standardisation will be needed within 5 - 10 years. In general it would be worth establishing frameworks rather than trying to specify every detail. In this respect, a certain potential for cost reduction coming along with standardisation is also expected<sup>154</sup>.

In the medium term, there is potential for a more segmented and diverse market for payment systems on the Internet, given the relatively low barriers to entry. However, conversely to trends of segmentation, significant market players such as VISA and Mastercard are working towards the consolidation of the credit card model and of related quasi standards<sup>155</sup>. Views differ on what will happen in the long run:

- it is not clear in which direction payment systems will head;<sup>156</sup> both segmentation and quasi-standardisation will tend to converge and co-exist.<sup>157</sup>

### 3.3 Cost for consumers, firms and regulators

#### **What costs does non-standardisation entail for consumers, companies and regulators?**

Recent studies in the USA estimate that the cost of using electronic payments is about one-third the cost of paper-based transactions. On this basis it is further calculated that the cost of a country's payment system may be equivalent to 3 % of its GDP<sup>158</sup>.

Many respondents<sup>159</sup> stated that it was difficult to estimate the costs of the non-standardisation of electronic payment systems. However, significant efforts were made to analyse and discuss the issue on qualitative terms.

According to the U.S. point of view,<sup>160</sup> it may be the lack of interoperability rather than of standardisation that imposes additional costs on various parties. These include operating costs due to

<sup>153</sup> De Nederlandsche Bank

<sup>154</sup> Deutsche Bank, Interpay

<sup>155</sup> D. Bartmann-IBI; La Caixa strongly believes that the credit card model will prevail in the private sector

<sup>156</sup> I. Grigg

<sup>157</sup> D. Bartmann-IBI

<sup>158</sup> see Daniel E. Nolle et al. *Technological Innovation in Banking and Payments: Industry trends and Implications for Banks*, Quarterly Journal, Vol. 17, No. 3, September 1998

<sup>159</sup> Danmarks Nationalbank, Interpay, A. Prinz, D. Bartmann

<sup>160</sup> US Federal Reserve System

low levels of usage and capital costs for additional hardware and software needed to accommodate multiple instruments.

It is widely agreed that there will be many different payment solutions, geared towards specific consumer and company situations. The back-office part of these solutions will very likely be based on the existing back-office arrangements of the financial sector and thus in most large countries will become part of the current standardised infrastructures for retail payments. The front-office part of these solutions (either smart-cards, software, etc) will vary widely; a large number of different payment products and brands will be introduced and then co-exist<sup>161</sup>.

If economic benefits outweigh the cost, some of the payment instruments may become interoperable and standardised, while others may remain tied to a single application domain. Integrated terminals and other system integration applications can typically be designed to accommodate multiple instruments at the point of sale, for example, thereby tending to lessen incremental costs arising from the existence of multiple instruments and standards. However, the need to facilitate payment for different types of transactions as well as to accommodate different consumer preferences may result in the creation of a variety of new instruments with distinct attributes that may not easily meet a fixed standard.<sup>162</sup>

Achieving sufficient economies of scale seems to be equally important for the service providers and the user society.

- **Costs and benefits to providers of payment systems and services:** in payment services the general situation is that new systems will have larger fixed costs but lower margins than older ones. Thus, the service providers are clearly interested in promoting new payment systems if the prospects for achieving a critical mass<sup>163</sup> of users are positive. In the contrary case, they have an incentive to stick to old methods, and are unwilling to invest into new technology unless guaranteed that the volumes achieved are sufficient to cover the costs. In this respect, the failure of DigiCash is the most prominent example reported as suitable for visualising the cost of non-standardisation.<sup>164</sup>
- Non-standard solutions invite regulations, incite consumer scepticism, require wasted investment and in the long term, are replaced by a standardised global process (the credit card model).
- On the other hand, non-standardisation creates increased competition between payment systems, which in turn contributes to the generation of innovation. In many cases, these benefits may exceed the cost of non-standardisation, which can be, among others, the duplication of infrastructure facilities and software development efforts by competitors<sup>165</sup>.
- **Cost and benefits to consumers and companies:** the costs of non-standardisation may become exceedingly heavy if different systems co-exist for the same type of transactions and are not interoperable with each other. If, due to lack of standards, several incompatible systems emerge, the result may be that none of them is able to obtain a sufficiently large customer base to justify the investment costs. Thus it reduces the incentives for development and innovation.

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<sup>161</sup> De Nederlandsche Bank

<sup>162</sup> US Federal Reserve System

<sup>163</sup> Danmarks Nationalbank, Riksbank Sweden, Bank of Finland,

<sup>164</sup> S. Smith CurrentAnalysis, Cybercash

<sup>165</sup> G.P. Dwyer Jr.

- **Standardisation and interoperability are crucial factors in achieving a critical mass of users.** Non- standardisation would imply continued use of less cost-effective payment methods instead of socially more efficient electronic payment methods<sup>166</sup>.

Both consumers and firms have independent decisions to make on whether or not to make use of the services of payment systems providers and banks. Firms that need to buy two types of equipment in order to serve a single geographic market may delay their use of this equipment until the providers of these services have established an interoperability agreement. Similarly, a consumer who is too confused by different payment products and mechanisms may simply choose not to use all the different products from different institutions but choose a preferred bank for his payments. Consequently consumers and firms make their own cost/benefit analysis on whether or not to use non-standardised products. If, as a result, the demand for certain products is low, the providers may decide to change this by entering agreements on the use of common standards and interoperability. Furthermore, from the consumers' point of view, the confidence in new systems, (e.g. e-money,) will diminish if some schemes disappear in competition, especially if consumers lose some of their money because of a lack of protective legislation.

It is likely that there will be competition between different electronic payment systems on a domestic and cross-border level. In this respect most parties tend to agree<sup>167</sup> that non-standardisation will entail costs for the participants due to the lack of flexibility, efficiency, competition and innovation. Furthermore, there is apparent consensus that current developments indicate that at least with electronic purses in Europe, common standards are being created at present so that systems will be interoperable in the medium and long term.

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<sup>166</sup> According to the Bank of Finland, the costs of non-standardisation can have several causes. The most important are barriers to the development of electronic payment systems (for example due to non-standardisation)

<sup>167</sup> Deutsche Bundesbank

## 4. Regulation versus Standardisation

### 4.1 Market forces, achievements and options for co-operation with the regulator

**Should markets or regulators impose future standards – if necessary – for electronic payment systems?**

**Standardisation might either evolve from market forces or be imposed by regulators. Given existing market imperfections<sup>168</sup>, there is no guarantee that market forces will produce the most efficient outcome. On the other hand, imposing standardisation by regulators runs the risk of stifling innovation in this field. Moreover, if international regulators fail to co-operate, it could lead to a fragmentation of markets.**

The importance of common standards for electronic payments has already been emphasised.

On the international electronic markets there is a need for global solutions. However, international regulators, including the European Commission<sup>169</sup>, have not considered it necessary to impose standardisation on other payment methods: either cross-border<sup>170</sup> or purely national systems. This lack of international standardisation does not allow connectivity among different national payment systems. Naturally, this could create some delays in the processing of certain types of cross-border payments<sup>171</sup>. In future, the extent of international standardisation will depend on the **amount of trade across borders**, and the Internet is likely to increase that trade if anything. This will give private agents an incentive to standardise across borders. These agents will not have an incentive to protect a local market, whereas a government might well<sup>172</sup>.

There is wide agreement that imposing standards by regulation might not be the best way to follow: a market approach to standardisation seems to be more appropriate<sup>173</sup>. Vocal supporters of the market approach to standardisation go a step further and see it as a purely commercial issue<sup>174</sup> which should be left to the discretion of the system's operators, and say that regulators' involvement should be minimised.

There are interesting analyses which go beyond the innovation issue, and highlight competitiveness dangers which could emerge as a result of too strong a regulatory pressure in Europe. These analyses

<sup>168</sup> G.P. Dwyer Jr. notes "there are government imperfections as well"

<sup>169</sup> EC-ISGNMP

<sup>170</sup> According to the Deutsche Bank, cross-border issues are difficult for regulators to resolve at operational level

<sup>171</sup> Banco Central De Reserva Del Peru

<sup>172</sup> G.P. Dwyer Jr.

<sup>173</sup> Deutsche Bundesbank, Danmarks Nationalbank, De Nederlandsche Bank, Riksbank Sweden, ESBG, Swiss Bankers Association, Den Danske Bank, APACS, Interpay, Intuit, D. Bartmann-IBI, G.P. Dwyer Jr., Lufthansa, Svensk Handel

<sup>174</sup> Cera Bank, ESBG, Royal Bank of Scotland, NTT, P. Janson-IBM, Brokat

anticipate that the different national approaches would not permit significant progress, leading sooner or later to US market-led standards being adopted in Europe. Possibly, this would be to the detriment of European producers and consumers - or of the interoperability of different standards being adopted in Europe and in the US (and probably the rest of the world). In the context of the globalisation of payment systems, such an outcome would be harmful to all parties<sup>175</sup>.

Central Banks understand, in general, that their monitoring role is to watch for evidence of market failure. Regulation on this field could prove to be ineffectual because of more rapid market developments than regulators can keep pace with. Premature regulation or standardisation is likely to interfere with the long-term development of payment products that genuinely meet the needs of commerce.

**Cooperation between markets and regulators** is considered<sup>176</sup> possible and desirable if this is limited to the development work for standardisation and to process-interventions stimulating market participants to agree on standards. One preferred option would be cooperation to establish non-mandatory guidelines in the way UN-EDIFACT works<sup>177, 178</sup>.

However, it is also suggested that when it comes to payment schemes, standardisation processes are more complex and go far beyond questions of pure technical considerations. In this light, the role of the regulators could be to specify the overall requirements for e-money schemes. Furthermore, an overseeing function of the regulator may also have the secondary effect of promoting the products, since users will sense that they have been vetted for fairness by a neutral, respected body, and will be more inclined to trust them.

Referring to Germany, history shows that negotiation processes in banking used to be difficult and slow, even on the national level<sup>179</sup>. Moreover, national solutions are clearly insufficient considering the nature of world-wide e-commerce and the increasing number of cross border-transactions. For this reason it can be expected that negotiation problems may well multiply when players and monetary policies from several countries are involved.

In the USA<sup>180</sup>, there is advanced experience with the deployment of credit cards, traveller's checks, etc.. The applied models are instructive, as they were developed and standardised privately, then regulated as necessary to ensure suitable user protection, industry safety and soundness, etc.. It is important to note that the U.S. payment companies, banks and technology firms are already falling back on practices used to establish the automated clearing house (ACH) system 20 years ago<sup>181</sup>. After some initial attempts by private interests to dictate the structure of new payment systems, it was realised that the business processes surrounding these new payment types were largely the same as those for existing systems. Thus, major players in the U.S. payments market have formed groups such as the Banking Industry Technology Secretariat (BITS). New technology issues are addressed under existing structures, such as the National Automated Clearing House Association (NACHA), which houses the Bill Payment Council, the Internet Council, and the Cross-Border Council, to name a few. Likewise, it is advisable that similar cross-border and European organisations be chosen as the forums

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<sup>175</sup> APACS

<sup>176</sup> Deutsche Bundesbank, De Nederlandsche Bank, Bank of Finland, Leonia Bank, Europay, R. L. Field, A. Prinz, Brokat, E. Blot-Lefevre-ECE, K.H Achinger-debis (regulation should support market-driven initiatives i.e. SET, EMV, CEPS), Minoru Saito

<sup>177</sup> Den Danske Bank

<sup>178</sup> According to IC Focus, the essence of UN/EDIFACT is the provisioning of standardised data interchange formats and of message structures. In this respect, it is felt that a clear distinction needs to be drawn between technical guidelines and technical specifications.

<sup>179</sup> D. Bartmann-IBI

<sup>180</sup> R.L. Field

<sup>181</sup> S. Scott-CurrentAnalysis

in which issues of new payment forms and systems are managed. Such arrangements have to date been sufficient to sort out emerging issues of standardisation and regulation.

The need for pan-European standardisation of formats used in Automated Clearing Houses has also been reported<sup>182</sup> to IPTS.

Regarding e-money schemes the U.S. point of view is clearly based on the consideration that at the early stage of development of many electronic money products, especially in the USA, it makes little sense for regulators to impose common standards or to require interoperability.

The issue of co-operation between markets and regulators is extremely complex and deserves further consideration. There are interesting views, in particular on:

- **The role of the regulator in the further deployment of the credit card model.** According to the view<sup>183</sup> about the cost of non-standardisation due to **trust circles** (see Chapter 3.2) the regulator should assist the parties concerned to overcome commercial rivalry in order to force the best solutions at community level. Solutions could be offered with the introduction of new payment instruments. More straightforward payments methods could be devised by the banks themselves. A good example is the Electronic Check being developed in the USA by a consortium of major banks called FSTC (Financial System Technology Consortium).
- **Digital signatures**, which represent<sup>184</sup> a very suitable example with which to illustrate the difficulty of regulating existing payment instruments. According to VISA, a player with key interests depending on currently stalled authentication standard setting procedures, it is extremely difficult to reach a balance between mandatory requirements and open standards. Legislation should regulate the use of digital signatures only when this is strictly necessary. In this respect, the focus of future debates will be on the following open questions:
  - Can industry introduce digital signatures without regulation?
  - In which cases are regulatory standards for digital signatures absolutely necessary?
  - What are the prospects for international co-operation, regarding:
    - ◆ the regulation of digital signatures?
    - ◆ the operation of global electronic markets based on private certification?

Examples of successful standardisation efforts at industry level are numerous:

- Message standardisation by SWIFT.
- On an international level interoperability agreements and technical standards have similarly evolved for automated teller machine transactions (ATM) and for electronic funds transfers at the point of sale (EFTPOS<sup>185</sup>). Also in this context, regulators (in this case the European Commission) have limited themselves to the process level of intervention by stimulating providers to realise interoperability (Recommendation, 1987). Another example would be the agreement on the international bank account number (IBAN).

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<sup>182</sup> Den Danske Bank

<sup>183</sup> Fintel

<sup>184</sup> VISA

<sup>185</sup> Reserve Bank of New Zealand: the original EFTPOS developments demonstrated that competing alternatives can sometimes delay progress because retailers - and others - do not want to have to deal with a number of incompatible systems

- **The credit-card model**<sup>186</sup> proved actually to be very efficient in achieving the establishment of common industry standards. In this context, ISO 7816 and 8583 have greatly improved card acceptance and the use of cards for payments across the globe. Credit cards associations were the first to succeed in creating a such truly global payment instruments. This was achieved largely through cooperation between a large number of credit institutions in independent umbrella organisations which developed common operating regulations, technical standards, promoted the organisation's brand and other centralised functions. Good examples for recent international industry payment standards is SET (Secure Electronic Transaction), EMV<sup>187</sup> and CEPS<sup>188</sup>.
- In some markets, e.g. Germany, banking competitors have come together to agree a framework of communications technology – the Home Banking Computer Interface (HBCI). The first HBCI based services are already available in Germany. In this example of 'co-opetition', competing banks have jointly agreed the principles of the standard (including security levels), and will continue to compete in terms of the services which they develop and offer in accordance with the standard. Importantly, the standard has evolved with the close involvement of the financial institutions themselves.
- Similarly the Open Financial Exchange<sup>189</sup> (OFX), an international specification for the online financial services industry, has evolved from a number of separate IT industry initiatives, and now has the backing of an increasing number of international banks and financial institutions who are represented on the OFX Steering Committee. It seems likely, for the short to medium term at least, that differing standards in online banking will co-exist<sup>190</sup>. Certainly market forces should allow financial institutions to choose the technology they use to implement online services. Whilst the option still remains for banks to adopt a proprietary banking communications standard, in OFX there is now a standard which offers support for the widest range of online financial services, and which meets the requirements of international markets.

With respect to e-money, unlike the general perception in the USA about the current "too early" stage of development, the banking industry in Europe is emphasising its firm commitment to support the necessary standardisation developments. However, this is the result of long development efforts. The lack of standardisation meant that over 20 distinct and incompatible electronic purse projects were implemented in Europe during the last few years. Obviously the market was unable to promote a standard and the major card systems decided at the outset to wage a battle for positions rather than

<sup>186</sup> Deutsche Bundesbank, Danmarks Nationalbank, Bank of Finland, De Nederlandsche Bank, Riksbank Sweden, APACS, Europay, VISA, Interpay

<sup>187</sup> Specification created by Europay-Mastercard-VISA in July 1996. EMV defined functions corresponding to credit and debit applications in chip cards. EMV has realized three different standards versions: the first one on 30 June 1994; the second in July 1995 and the third one in July 1996. Further information available at: <http://www.visa.es/ingles/pys/nt/tibc.html>

<sup>188</sup> According to VISA and EUROPAY, CEPS (Common Electronic Purse Specifications) constitutes a common initiative of the two main international payment card schemes in Europe (Europay and Visa). Two of the main national purse operators in Europe (GeldKarte in Germany and Sermepa of Spain) are also associated. CEPS is supported by the most important European purse supplier (Proton World). CEPS defines the requirements needed by an organisation to implement a globally interoperable electronic purse program. It requires compatibility with the EMV specifications for chip cards and defines the card application, the card-to-terminal interface, the terminal application for point-of-sale and load transactions, data elements and recommended message formats for transaction processing. It also provides functional requirements for the various electronic purse scheme participants and uses public key cryptography for enhanced security. Further information is available at <http://www.visa.es/ingles/pys/nt/tibc.html>

<sup>189</sup> Open Financial Exchange (OFX) is a unified specification for the electronic exchange of financial data between financial institutions, business and consumers via the Internet. Created by CheckFree, Intuit and Microsoft in early 1997, OFX supports a wide range of financial activities including consumer and small business banking; consumer and small business bill payment; bill presentation and investments, including stocks, bonds and mutual funds. Other financial services, including financial planning and insurance, will be added in the future and will be incorporated into the specification. More information is available at <http://www.ofx.net>.

<sup>190</sup> Intuit

create a standard, which would develop the product itself<sup>191</sup>. The initiative taken by certain companies, among which is Sistema 4B, together with the impulse given by the European Committee for Banking Standards (ECBS), is making it possible to create a standard accepted by the majority of European means of payment institutions. In this respect, it is reported<sup>192</sup> that the work done and progress achieved in 1998 by ECBS on the standardisation of electronic purse systems shows that there is a consensus within the banking industry about the importance of standardisation of electronic payment systems. Clearly this standard is not by itself sufficient. The development of operational and implementation rules is necessary. The CEPS group (Common Electronic Purse Specification) is complementing the work of ECBS in order to cover the whole of the standard.

CEPS has been developed by VISA Int., Europay Int., ZKA and Visa España/SERMEPA for safe credit card payments in the Internet.

According to VISA, CEPS can already be considered as the accepted purse standard. A high number of European and non-European financial institutions have announced plans to migrate to CEPS, in total accounting for 90% of the electronic purse cards world-wide. CEPS complies with the ECBS standards but is not restricted to the financial industries. Other industries may also use CEPS as a basis for their payment product for low values.

Europay has recently submitted proposals for a purse standard to the European Committee for Banking Standards (ECBS). The aim is to reach an industry wide agreement on a common technical platform enabling the application of euro cross-border purses for roll-out by 2002. Europay is confident that agreement will be reached on a standard for purse interoperability before the end of 1999 and estimates that the standard could have a global reach, giving a significant advantage to the European chip industry.

There are critical views<sup>193</sup> according to which CEPS will only establish technical interoperability between the existing national e-purse schemes, but not system interoperability. Even if all cards and all terminals in Europe are based on CEPS, there will still be no cross-border e-purse scheme. System interoperability would be the next step to establishing an open system between different issuers and acquirers in different countries. This is not only a difficult undertaking, but also very expensive<sup>194</sup>.

Given the reach and range of the standardisation problem, it is suggested<sup>195</sup> that a multinational consortium which comprises banks and technology vendors, the ECB, and Central Banks in the EU, could form an appropriate institutional forum to tackle the whole diversity of the complex technological, legal and monetary issues.

A point of view from a developing country<sup>196</sup> is that the global economy definitely demands the introduction of world-wide standards in electronic payment systems. Regulators and marketers are called upon to establish and strengthen long-term cooperation with international organisations such as the IMF, World Bank, and the BIS.

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<sup>191</sup> Sistema 4B

<sup>192</sup> ESBG

<sup>193</sup> PaySys

<sup>194</sup> According to PaySys there is a need for an overall system consisting of brands, rules & regulations, contracts with merchants, interchange fees between acquirer and issuer, clearing and settlement system, etc. In the credit card world of Visa and Europay the marginal cost of system interoperability is (based on PaySys research results) at least approx. 25 to 35 Euro cent per electronic transaction. Accordingly, on a world scale the impact on still non-existent business case of national e-purse schemes is evidently on the negative side. Cardholders on holiday will certainly not be willing to pay a 25 Euro-cent fee for a cross-border transaction to buy - for example - a newspaper at the beach kiosk by using an e-purse.

<sup>195</sup> D. Bartmann-IBI

<sup>196</sup> Banco Central De Reserva Del Peru

## 4.2 Past successful models for current action<sup>197</sup>

**Are there any past examples of technological standardisation, which could serve as models for the development of interoperability standards for electronic payment systems both in Europe and on a global scale?**

This question was generally perceived as very difficult to answer. Looking into the past, payment systems can be compared to different kinds of other networks, especially in public infrastructure:

- GSM - a good example, according to most experts
- railways (defining the gauge), aerospace, telephones, electricity
- the Internet Engineering Task Force
- SGML (the basis for HTML and XML)
- free video-recording standards (VHS, Video 2000)
- MPEG2 (standard for multi-media digital encoding).

Arguably the timing of coordinated European intervention within the mobile phone market through the European Telecommunications Standardisation Institute (ETSI) enabled the industry to identify market imperfections via trailblazing providers supplying innovator consumers. It may also have enabled ETSI to learn with the market, to understand what level of intervention and coordinated standardisation would best serve the interests of a fledgling market which had already proved its growth potential.

The following negative examples highlight<sup>198</sup> the poor record on standardisation of governments:

- the difficult discussions over cryptography and digital signature policy.
- The conflict between phone company standards and computer company standards. Historically, governments have backed the former (such as X.400) while the market has favoured the latter (such as SMTP). The main reason for this is that phone company standards evolve on a 15 year cycle, versus the computer industry's 15 months. Governments can cope with the phone companies' pace but not that of computer companies.

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<sup>197</sup> Information sources: a useful listing of standards and specifications, guidance material for electronic payment, electronic commerce, etc., are available on the EC's I\*M Europe server <http://www2.echo.lu/oii>

<sup>198</sup> Ross Anderson

## 5. Regulatory options for electronic money

### How should the issuers of electronic money be regulated?

Regulation is necessary in all areas where legal certainty is required. The difficulty of introducing an appropriate regulatory regime for the issuance of electronic money should not be underestimated. All parties agree that this is a very complex area and it is essential that detailed opinion is canvassed widely before decisions are made.

At first, an important element in the discussion is whether the regulatory strategy takes a fundamental approach or is based on partial regulation of issues.

An example of the fundamental approach can be found in the United States and countries such as Canada, Australia, and Norway. In these countries the provision of payment services is seen as a business activity which can be executed by non-banks and which can be regulated separately. In most European countries, the provision of payment services is not regulated as a separate business process, but seen as part of banking or left unregulated.

In this respect, it is interesting to examine the need for a strategic plan at EU level to provide a clear and integral vision on how to regulate the internal market for provision of payment services and payments products to the public. For the time being, some players view the current framework as a partial regulation of issues<sup>199, 200</sup>:

- Recommendation to stimulate interoperability (1987)
- Recommendation for contract terms of electronic payment cards (1988, updated 1997)
- Directive on cross-border payments (1997)
- Directive on settlement finality (1998)
- Action plan against fraud (1998)
- Directive on electronic money institutions (1998).

It is also worth further studying the feasibility of establishing an integrated strategy on how to regulate the internal market for provision of payment services and payments products to the public at EU level.

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<sup>199</sup> Swiss Bankers Association

<sup>200</sup> According to De Nederlandsche Bank, the EU market for provision of payment instruments is unevenly regulated. Issuers of private label cards will be subject to different legislation in different countries. In Germany (for deferred payment >4 weeks) and France these issuers would have to be banks, but not in Belgium and the Netherlands. Similarly credit-card organisations might be supervised in one country and left unsupervised in another. It appears rather strange that such diversity of regulation should apply to essentially the same business process: making payments. It seems equally interesting, that the Commission is making an enormous effort to regulate pre-paid payment instruments, which will in the foreseeable future consist of 0,00001 - 0,05 % of the number of all payments effected, yet meanwhile, the regulation of the provision of payment services such as direct debits, in payments and credit-transfers (60 % of payments market) is left to the discretion of national authorities.

## 5.1 Non-Banks versus Banks

**It has been suggested that only financial institutions should be allowed to issue electronic money. However, there are alternative options for the regulation of issuers of electronic money, according to which issuers may have a different status from financial institutions.**

Implications to monetary policy-making issues should first be carefully considered before discussing who should be able to issue electronic money<sup>201</sup>.

The fixed costs of e-money schemes are high. On the other hand, the margins of handling payments must be relatively small, especially as there are other payment methods - cash and debit and credit cards - which can substitute e-money. This and the presence of large network externalities - which indicates that the customers prefer large schemes to small ones - indicate that successful electronic money schemes must be large<sup>202</sup>. This implies that establishing a successful new e-money scheme can most likely be done only by institutions of a certain calibre in terms of financial strength and supervision<sup>203</sup>.

The argument that the supervisory regime applied to banks is too heavy and complicated to be applied to the institutions specialised in e-money is commonly used, but it lacks the reasoning concerning which parts of the regime are actually unnecessary and unsuitable to apply to specialised e-money issuers<sup>204</sup>. Thus, it is often claimed that a limited prudential control should be sufficient to ensure the soundness of e-money issuing activities. In this respect, the main point of controversy is the question of which types of entities are allowed to issue electronic money. The discussion is often presented as opposing 'banks' (credit institutions) to 'non-banks' (companies which intend to issue e-money).

"Issuance" of electronic money is composed of many discrete functions, not all of which are as yet recognisable as separate<sup>205</sup>. At one time, the banking industries were perceived to have a secure franchise in the payment system. Non-banks performed some functions, but they were seen as being on the fringes, and inconsequential. With new technologies, there are perceptions, that non-bank players can readily perform pieces of the payment function. This could foster competition, innovation, and eventually the overall efficiency of payments.

Limiting electronic money issuance to banks has a number of consequences. It protects an industry that historically has been a critical economic engine. It places new payment services within a heavily regulated, understood, and controllable context. It utilises the existing public trust in financial institutions as a springboard to the acceptance of new products and services. In doing all these things, it also promotes the economic *status quo* and limits innovation to products and services that protect

<sup>201</sup> VISA

<sup>202</sup> According to PaySys local e-purses could be successful. Today the vast majority of cash payments are still in a local environment. These e-purses can be more successful than e-purses with national or international acceptance because local product needs will have to be considered. Cardholders may have a higher affinity to their local card and to spending money locally.

<sup>203</sup> Bank of Finland, VISA, D. Bartmann-IBI

<sup>204</sup> ECB

<sup>205</sup> R.L. Field

and promote banking industry interests. Along this line, there are also bold opinions<sup>206</sup> about the inadequacy of banks to operate electronic money systems. First of all, banks are concerned with banking, which is to say the taking of deposits from the public, and the making of loans to the public. By their nature, these loans are risky, and thus the nature of banking is very much the balancing of risks against liabilities. This characteristic is directly contrary to the spirit of new payment systems, which by means of 100% reserves and real time gross settlement (RTGS), strive to eliminate risk from the system. This contrast becomes apparent when examining balance sheets. In contrast to banks, the balance sheets of a payment system are simple, complete in picture and easy to overview.

There is significant support<sup>207, 208</sup> for regulatory options allowing issuers of electronic money to have a different status from traditional credit institutions. For example, the risks presented by this activity can be considered as having a different character compared to those encountered in general banking business. In this light, the regime for regulating credit institutions is not necessarily the most appropriate for other issuers of electronic money.

In this respect, the US Federal Reserve does not currently impose regulations specifically directed at issuers of electronic money. However, it considers that it may be the case in Europe as in the United States that a less rigorous approach to the regulation of electronic money instruments and respective issuers is appropriate at the moment. Continued innovation and experimentation may suffer from the premature imposition of comprehensive rules and regulations.

The position of the European Central Bank<sup>209</sup>, as reflected in the Report on Electronic Money (ECB, August 1998), is that the issuers of e-money should fulfil the minimum requirements presented in the Report, irrespective of their institutional form. The most straightforward solution for achieving this would be to limit the issuance of electronic money to credit institutions as defined in Article 1 of the First Banking Co-ordination Directive (Directive 77/780/EEC). Since not all e-money issuers would fall under the current definition of credit institution, the ECB would welcome the amendment of the definition to include all e-money issuers. This would provide a level playing field, particularly as it would ensure that all issuers of e-money would be subject to an appropriate form of prudential supervision and would fall within the range of institutions potentially subject to ECB reserve requirements.

Several Central Banks and other parties concerned support the ECB position<sup>210</sup>. According to the French Central Bank, restricting the issuing field to financial institutions should not hamper the development of technological initiative. Customers and traders are primarily looking for universal payment means, not for incompatible private initiatives.

Finally, the regulatory option - that issuers of electronic money could have a different status from traditional credit institutions - is reported to have raised concerns<sup>211</sup> in the European Banking industry, a part of which believes that this regulatory option will have significant effects on the financial marketplace in Europe. These concerns refer to the protection of consumers, the soundness of issuers and integrity of financial markets and also include aspects related to potential risks of fraud and money-laundering.

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<sup>206</sup> I. Grigg

<sup>207</sup> Danmarks Nationalbank, Banco de Portugal (provided that non-banks and banks are subject to the same regulations), Riksbank Sweden, Svensk Handel, Reserve Bank of Australia, Reserve Bank of New Zealand, NTT, C. Kuner,

<sup>208</sup> <http://europa.eu.int/comm/dg15/en/index.htm>: E-money: Commission proposes clear regulatory framework.

<sup>209</sup> ECB.

<sup>210</sup> Deutsche Bundesbank, Banque de France, Europay, AIB Bank, APACS, Alpha Credit Bank, Interpay, Royal Bank of Scotland, Den Danske Bank, ESBG, Cybercash, Ross Anderson, CartaGo, P. Janson-IBM, D. Bartmann-IBI, La Caixa, L. Gramlich

<sup>211</sup> ESBG in association with the European Banking Federation and European Association of Co-operative Banks, Royal Bank of Scotland

## 5.2 Applicable minimum rules

### **What rules should be imposed upon issuers of electronic money and who should monitor them?**

Depending on the definitions applied, electronic money stored on a pre-paid card can be or not a deposit. In this respect non-bank issuers in the EU will have to be prohibited from operating current/depository accounts<sup>212</sup>. The regulatory options for electronic money will depend very much on the final definitions that will be used to determine if an electronic money scheme is subject to the regulation<sup>213</sup>. If these definitions are too broad, the regulation might become over-comprehensive, leading to the need to supervise even the smallest multi-purpose pre-paid schemes as well as pre-paid limited-purpose schemes. Consequently all kinds of current payment solutions, such as payment on public transport, and gift vouchers, etc, will have to be supervised, whereas in the paper world these have been unsupervised until now. The administrative burden of regulation may in that case be very high. In practical terms, e-money regulation should not apply to limited purpose applications (pre-payment for a narrow range of goods, such as public transport), and to small-scale multi-purpose applications.

There is broad agreement<sup>214</sup> that payment systems, which might pose risks to the financial system or to the public's confidence in money, must be subjected to regulation and prudential supervision. The basis for this agreement are the recommendations and rules pointed out by the European Central Bank in its Report on E-Money of 1998, according to which, issuers of e-money should be supervised by the banking supervisory authorities and e-money systems should be overseen by Central Banks.

Several parties<sup>215</sup> consider that provisions to enforce conformity, e.g. via a level playing field, should be substantial to make absolutely sure that competition is not distorted

Issuers of electronic money do not "play the same game" as credit institutions, nor do they impose similar systemic risks. The main focus for regulators, at least from a supervisory point of view, should be the risks inherent in such schemes, in particular operational and liquidity risks. Currently, credit institutions issuing electronic money are not faced with harmonised regulation on liquidity risks stemming from this activity, nor do the present draft directives suggest such regulation. However, for issuers of electronic money other than credit institutions, the draft directives suggest regulation (in particular limitations on investments) which takes special account of liquidity risks, thus suggesting a more appropriate regulation. The aim is to introduce a proper regime as regards liquidity risks stemming from electronic money activity, and this should not be hampered by the creation of a level playing field, which should remain at most a secondary aim.

<sup>212</sup> a deposit-taking activity is prohibited to undertakings other than credit institutions, pursuant to Article 3 of Directive 89/646/EEC

<sup>213</sup> De Nederlandsche Bank

<sup>214</sup> Deutsche Bundesbank, Danmarks Nationalbank, Banco de Portugal, Banco Central De Reserva Del Peru, Riksbank Sweden, APACS, Deutsche Bank,

<sup>215</sup> Danmarks Nationalbank, Banco de Portugal, VISA, Interpay

According to the Riksbank in Sweden, electronic money systems are still in an early stage of development. It is important to maintain a delicate balance between the need of regulation and the goal of not imposing too heavy a regulatory burden on market players. The latter situation could lead to decreased incentives for technological development and innovation.

Regarding the recent proposal for a EC Directive, the following additional requirements are perceived to be necessary for regulating non-bank issuers of electronic money:

- **Redeemability.** The regulatory options allowing issuers of electronic money to have a different status from traditional credit institutions should be supplemented by **redeemability**<sup>216, 217</sup> as a minimum requirement. According to this all issuers of e-money would be legally obliged to redeem e-money in central bank money at the request of the e-money owners. Redeemability is important for ensuring that e-money will remain at par with the official currency. Without redeemability there is a threat that the value of e-money issued by some ELMI<sup>218</sup> will be discounted if there are suspicions in the market about the financial strength of the issuer. For customers it is also important to be able to get their money back e.g. when moving away from the e-money service area. Thus, redeemability is essential in helping to guarantee customer confidence. It will also reduce the risk of too much e-money being issued.
- **Restriction.** Companies issuing e-money should not be allowed to extend their business beyond closely related activities. If such additional business activities were to be permitted then supervision and controls would need to be appropriately scaled<sup>219</sup>. Controlling and supervising e-money in order to secure that the e-money float is invested in a proper way is difficult if the companies are very large and complex. The risks inherent in the other business areas can jeopardise the e-money float. In this respect, the administrative burden of the proposed directive may therefore be greatly underestimated. However, if large companies want to issue e-money, they have an option to establish a subsidiary for this purpose.
- **Factual disclosure.** All public disclosure by issuers should be factual. Issuers should be subject to normal remedy under law (they get no special dispensation, nor they are subject to special requirements). In addition to these minimum and sufficient requirements, the following recommendations on actions and obligations are expressed<sup>220</sup>, to be taken into consideration by issuers:
  - Reserves are escrowed with third parties that specialise in safe-keeping of funds.
  - Reputable parties, such as internationally known partnerships in law or accounting, are to be placed in charge of major escrowed reserves.
  - The total reserves should be publicly stated over the Internet by means of account balances.
  - The total float of a currency should be publicly stated over the Internet.
  - Individual accounts that are used for escrow, monetary creation, and internal treasury functions, should be publicly scrutinisable over the Internet.

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<sup>216</sup> Bank of Finland, Banco de Portugal,

<sup>217</sup> the issuance of electronic money should be limited to credit institutions and redeemability should be a minimum requirement: Deutsche Bundesbank, La Caixa

<sup>218</sup> Electronic Money Institutions

<sup>219</sup> Bank of Finland, APACS

<sup>220</sup> I. Grigg

- A clear process for dispute resolution should be described for the consumer. This would rarely involve resorting to the courts as neither issuer nor consumer can afford such activities in the low-margin business of payment systems.

Further reported observations on potential regulatory options and impacts are as follows:

- Due to the asymmetry of information, customers are usually unable to assess correctly the issuers' creditworthiness<sup>221</sup>. This calls for transparency measures.
- According to French experts<sup>222</sup>, instead of slowing the development of effective e-money systems, restricting e-money issuance activity to the banking sector can in fact speed up customer confidence and acceptance regarding the new payment instrument. This will also have positive effects on innovation, and reduce the banks' risks of damaging their reputations.
- The setting of lower capital requirements to an ELMI creates an uneven playing field<sup>223</sup>. This could force larger institutions to circumvent their own regulatory regime through subsidiary ELMIs.
- There is concern<sup>224</sup> about the definition and the real meaning of the term "electronic money"
- A problematic aspect for future standardisation on international level could occur if exceptions were allowed over the issuing of national electronic purses with national approval by central banks<sup>225</sup>.

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<sup>221</sup> Banco de Portugal

<sup>222</sup> Charles Goldfinger and Philippe Herbin: *How to Regulate Issuers of E-money*, Issue Paper prepared on behalf of IPTS, January 1999

<sup>223</sup> APACS

<sup>224</sup> APACS, PaySys

<sup>225</sup> Deutsche Bank

## 6. Implications of e- money on monetary policy

### How will electronic money affect monetary policy-making?

Electronic money systems share many characteristics with physical money (ie banknotes and coins), notably being non-interest bearing and “ready to use”.

However, since notes and coins have little significance for monetary policy, the question of how the e-money will affect monetary policy relates to the question of how different e-money is from other existing forms of payment, especially bank/credit cards. If the characteristics are similar, it is probable that the effects of e-money on monetary policy will be quite close to those caused by the development and increase of card payments. E-money can be claimed to have many characteristics like those of bank/credit card systems. These systems employ accounts which keep track of customer balances. In e-money systems such accounts can be kept on a card, but for security reasons the systems usually keep ‘shadow accounts’ at a central site. For some forms of electronic money aiming at enabling anonymous payments there is no shadow account kept at a bank but only pool accounts with no customer-related information<sup>226</sup>. Also, if required, there is a possibility of paying interest on the e-money balances. The banks will need central bank money to settle inter-bank e-money flows in the e-money environment as well. Therefore, electronic money should be included in monetary aggregates. However, the situation is currently complicated as there is no clear definition of e-money, and the systems are small without proper requirements for statistics<sup>227</sup>.

In this light, there is also a perception<sup>228</sup> that it may be premature to try to solve problems that so far exist only in theory, such as the relevance of monetary aggregates. For the moment it may be better to observe the direction that new payment products are taking, and to act when each issue becomes significant and once clearer information is available.

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<sup>226</sup> M. Escher, see also "Aktuelle Rechtsfragen bei Zahlungen im Internet", in: *Rechtsgeschaeft im Netz - Electronic Commerce*, publ. Lehmann, 1999.

<sup>227</sup> Bank of Finland

<sup>228</sup> R. L. Field

## 6.1 Likely effects of the widespread use of electronic money

**The widespread use of electronic money could affect the stability of money demand. This would further diminish the relevance of monetary aggregates as guides for monetary policy-making. Another possible effect of the widespread use of electronic money is a smaller demand for central bank money by commercial banks. As a consequence, it would be harder for central banks to steer the money market.**

Though electronic money is based on new technologies, the payment scheme itself would not be unique from the viewpoint of monetary policy. However, the circulation rate of electronic money might be very rapid due to its automated payment mechanisms<sup>229</sup>. Therefore it would at least be necessary to observe the circulation rate of real money more frequently.

The two main effects of electronic money on monetary policy-making are that:

- it diminishes the seigniorage income<sup>230</sup> of the central bank and that
- it may complicate the quality of information for central banks (monetary aggregates).

The widespread use of electronic money could affect the stability of money demand in as far as the speed of money is affected. This is however by no means a new phenomenon. As a consequence of innovation<sup>231</sup> monetary aggregates have become less stable over a period of 10-20 years in financial markets. In this light, it is conceivable that technical problems and difficulties will continue to arise<sup>232</sup>. According to another point of view<sup>233</sup>, lesser demands being made on central bank money are evidence of increasing efficiency in the financial system, and if this is attributed to electronic money in any way, then it should be seen as an additional benefit.

However, as long as electronic money systems function in the way they currently do, they pose no special threat for monetary policy<sup>234</sup>. Banks still have to settle their transactions in central bank money, which allows central banks to steer the money market.

The most important, yet least likely<sup>235</sup> effect of electronic money would be that it might completely replace cash in society, thereby eliminating the income of the central bank. This might create a situation in which central banks became financially dependent on the government. In theory this would create the possibility of the government using its power over the central bank to influence its monetary policy.

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<sup>229</sup> NTT

<sup>230</sup> In this respect it should be made clear that central banks are not profit-maximising institutions

<sup>231</sup> Riksbank Sweden

<sup>232</sup> Swiss Bankers Association

<sup>233</sup> I. Grigg

<sup>234</sup> Bank of Finland, De Nederlandsche Bank, Riksbank Sweden, Reserve Bank of New Zealand, Europay, Swiss Bankers Association, NTT, Ross Anderson

<sup>235</sup> Bank of Finland, De Nederlandsche Bank

## 6.2 Proposed solutions for central banks

**There have been several solutions proposed for how central banks should cope with these problems.**

It is widely believed that electronic money will not have an effect on the ability of the central bank to steer the monetary market, as several instruments for them to continue to do so are available to them. The whole process of rapid financial development, not only the introduction of e-money *per se*, should be considered relevant when analysing stability trends in monetary aggregates.

However, this trend does not necessarily imply that monetary policy is becoming more ineffectual, unless it is based on monetary aggregates as intermediate targets. The conclusion central banks might want to draw from this development is that monetary policy ought to be based on direct inflation targeting, with monetary targets being used as one of many other indicators.

One of the monetary policy concerns related to electronic-money is the risk of over-issue, which could lead to unconstrained money supply and thereby endanger price stability. This risk can be limited by a “redeemability” requirement, imposing a requirement on issuers to possess central bank money (see chapter 5; also ECB Report August 1998). Redeemability implies that issuers must be in a position to convert electronic money into central bank money at the request of the holder.

It is also argued that a requirement of redeemability is necessary in order to preserve the unit-of-account function of money. Without redeemability a situation could arise in which the retailer only accepts electronic value below par, e.g. if the soundness of the issuer is at stake. In such circumstances, the medium-of-exchange and store-of-value functions of money would no longer be consistent with the simultaneous unit-of-account function of money. Hence, the argument to impose a legal requirement that electronic money should be redeemable at par.

### 6.2.1 Widening the definition of monetary aggregates

**If electronic money is only a substitute for traditional forms of money, central banks could simply widen the definition of their monetary aggregates to include electronic money.**

Widening the definition of monetary aggregates is an obvious solution. Certainly, as these aggregates are used as indicators, central banks might want to widen their definition of them to include e-money and banks should be compelled to report the amounts issued<sup>236</sup>.

As far as strategy aspects are concerned, e-money involves the matter of defining money<sup>237</sup> (if non-banks issue e-money, the definition of money as "short-term liabilities of the banking sector to non-banks" becomes questionable). It also involves the matter of statistical coverage, and of the indicator quality of monetary aggregates and their controllability. As far as implementation aspects are concerned, the substitution of currency in circulation by e-money could reduce the central bank's balance sheet volume, thus reducing the potential for sterilizing operations. The leverage for setting money market conditions would become weaker.

From the point of view of a private bank<sup>238</sup>, it is strongly felt that central banks should widen their definition of the make-up of monetary targets to include e-money. Without this measure, in time the central banks will inevitably start to lose influence over the regulation of the whole money economy.

### 6.2.2 Imposing reserve requirements

**As the most far-reaching way to secure its hold on the money market, the central bank could impose reserve requirements on electronic money balances.**

For controlling the money market, the crucial point is that there is some interest-elastic demand for central bank money, so that the central bank can influence interest rates by controlling the supply of central bank money. So long as such money is considered 'special' and is demanded for settlement purposes, for example, it is not clear that the size of the central bank balance sheet matters. But if it does, as the statement suggests, it can be expanded in other ways: by reserve requirements<sup>239</sup> or central bank debt certificates.

<sup>236</sup> Riksbank Sweden, Banco de Portugal, US Federal Reserve, Interpay, G.P. Dwyer Jr

<sup>237</sup> Deutsche Bundesbank

<sup>238</sup> Royal Bank of Scotland

<sup>239</sup> Banco de Portugal

According to the U.S. Federal Reserve, there could be an effect on monetary policy implementation, if electronic money substituted importantly for demand deposits. At present, the Board of Governors has not considered the issue of their reservability because electronic money balances have not risen to a significant level. If mainly banks issued electronic money balances, and the Board elected to treat these balances as reservable on the same basis as demand deposits, there would be little effect on required reserves and hence little effect on monetary policy implementation. On the other hand, if non-banks issued electronic money balances, or if electronic balances were not required to be reserved, the substitution of electronic money for demand deposits would reduce required reserve balances. Required reserve balances have already fallen sharply in the United States over the past few years because of reserve avoidance activity unrelated to electronic money, and further reductions could lead to more volatility in overnight interest rates. Whether such an increase in volatility actually would occur and whether it would have any significantly adverse effect on financial markets and the economy are unknown.

Reserve requirements are not required for monetary policy reasons<sup>240</sup>. If reserve requirements were in place, they ought not to include e-money, unless e-money is seen as a development which central banks would want to stop. This is because e-money products do not currently offer interest rates and can, at least in that sense, be seen as substitutes for cash. Reserve requirements on e-money that do not apply for cash (M0) would be equivalent to the taxation of one payment instrument but not that of its close substitute.

## 6.3 Open key questions

### 6.3.1 How likely is the widespread use of electronic money?

A few years ago predictions were being made that electronic money would have a significant impact and result in widespread replacement of cash. It is now clear that these predictions were over-optimistic. Electronic money is only slowly gaining acceptance.

Central Banks have been monitoring the recent evolution of e-money systems<sup>241</sup>. The current figures of the "prepaid card loading amount" are reported to have stagnated for quite some time, although the number of distributed debit cards containing a micro-processor is very high for some countries in the EU. The volume of network money issued by banks is generally very low and appears to be limited by the current lack of applications<sup>242</sup>.

E-money on stored-value cards could gain importance, especially in the use of vending machines, parking lots and public transportation<sup>243</sup>. Network money will continue to grow in proportion with use of the Internet, the number of PCs and the volume of e-commerce.

Over the next ten years e-money will be all-pervasive and become an important part of money supply<sup>244</sup>. The chances of e-money coming into widespread use in the shorter term are generally

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<sup>240</sup> Riksbank Sweden

<sup>241</sup> Deutsche BundesBank, Riksbank Sweden

<sup>242</sup> I. Grigg

<sup>243</sup> Interpay

perceived as particularly hard to estimate<sup>245</sup>. It is very difficult to make any other kind of predictions than qualified guesses depending on the likely evolution of many variables, which in themselves are again hard to predict. Some of these variables have already been discussed in this note: the growth of Internet use and e-commerce, the outcome of the standardisation process and the rapidity with which a critical mass of consumers and sellers can be achieved.

Due to the characteristics shared with physical money it can be expected that electronic money will at most replace physical money<sup>246</sup>. Such a trend would probably require electronic money being able to act as a unit of account, a store of value and a means of payment on a par with physical money. This again requires issuers of electronic money to achieve and maintain levels of credibility close to that of the central bank, which is the issuer of physical money.

Of interest in this respect are projections within the emerging e-money industry which state that the widespread adoption of e-money depends to a large extent on the way in which systems are marketed<sup>247</sup>. For example, DigiCash™ has been a relatively promising electronic money pilot concept, but its wide adoption was undermined by the limited availability of services for which DigiCash™ could be used. The recent collapse of DigiCash has been attributed to the fact that patents were closely guarded by the holding company, and licences were not issued to propagate services more widely.

In general, it can be concluded that the **use of e-money will mainly depend on its attractiveness<sup>248</sup> to retailers and customers.**

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<sup>244</sup> Royal Bank of Scotland

<sup>245</sup> Deutsche Bundesbank, Deutsche Bank

<sup>246</sup> Danmarks Nationalbank

<sup>247</sup> Intuit

<sup>248</sup> i.e. costs, opportunity costs for cash handling, financial integrity of the issuer, solid and transparent legal framework, technical security, interest paid on loaded amounts, redeemability in reserve money, coverage by deposit-insurance scheme, etc.

### **6.3.2 Can e-money be considered as a new type of money? Will it only be a substitute for “official” money?**

Answers to this question vary from country to country. In Germany, the issuing of electronic money has led to an adjustment of the Kreditwesengesetz (German Law on Credit Matters). Thus for Germany e-money must indeed be regarded as **a new type of money**<sup>249</sup>. Other countries sharing this view are Sweden and USA<sup>250</sup>. According to the Federal Reserve, electronic currency issued by banks and other private firms, rather than by governments and central banks, might seem to be a particularly new and distinctive form of money. Such electronic money, however, would not be so different from private liabilities such as travellers checks and demand deposits, which themselves are substitutes for traditional currency.

In this respect, advanced technology players<sup>251</sup> consider that e-money does not replace “official” money. Instead it is a sophisticated accounting system, tracking where the funds remain on deposit in the banking system. (In this way it is also suggested that the central bank will have the infrastructure to record and control the money supply).

In some ways e-money systems resemble and in other ways differ from both cash and access products (payment instruments linked to the user’s bank account):

- As cash, e-money systems can be used anonymously; they do not require contact between seller and bank at the time of the transaction (off-line). They are not linked to the user’s bank account and are (at least currently) used for low-value transactions.
- They are similar to access products in as much as they offer a certain degree of audit trail, they can be used for distance payments, and they do not, in most cases, allow for transferability of payments (closed loop system).

Whereas e-money on stored value cards seems to have a great potential to substitute cash, e-money in the form of network money is more convenient for payments to distant recipients, i.e. mainly sight (current account) deposits will be replaced. Technological progress, on the other hand, will blur the lines between both forms of e-money and also facilitate their integration.

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<sup>249</sup> Deutsche Bundesbank, Riksbank Sweden

<sup>250</sup> Riksbank Sweden, US Fedearal Reserve

<sup>251</sup> Cybercash

### **6.3.3 Will e-money be limited to small amounts?**

This is currently the case. E-money systems will probably be limited to **small value payments**<sup>252</sup>, if they continue to be structured in the way they are today. However, it is not possible right now to make exact predictions. It depends mainly on the perceived degree of security<sup>253</sup> (hardware-related and software-related integrity of the e-money system) and the attractiveness of alternative payments via the secured transaction of credit card numbers on the Internet, or the costs of using correspondent banking - e. g. in case of cross-border transactions.

In general there is no limit<sup>254</sup>. Companies are starting talking about using the Internet for some high-value payments in the future. In fact, the more compelling applications for e-money are aimed at medium amounts: ones where the values at stake justify the additional expense, but where cost is still an overall constraint. Small amounts make little sense at the moment, as all systems so far proposed impose large set-up costs for users and providers. Large amounts are also unlikely to be in the vanguard before such amounts can be trusted to as yet untested technology. In any case, individual higher limits should be subject to explicit single allowances and adequate individual acceptance of related risk exposure<sup>255</sup>.

For the sake of discussion, medium amounts are proposed<sup>256</sup> to be from 100 Euros to 10,000 Euros.

### **6.3.4 Would the replacement of “official” money by e-money represent a threat for monetary policy, and if so over what volume?**

It is the opinion of most Central Banks that electronic money will not affect monetary policy-making in any significant way, given its present and most likely future form and prevalence.

A widespread use of e-money would certainly lead to diminished seignorage income. However, central banks' main objectives are often expressed in terms of “promoting a safe and efficient payment system”. The maximisation or the preservation of seignorage income is not a goal in itself. In as much as e-money instruments can come to realise the efficiency gains promised (lower transaction costs for banks and sellers deriving from decreased cash management, convenience gains for users), this ought to be considered.

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<sup>252</sup> Riksbank Sweden, Interpay, Cybercash

<sup>253</sup> Deutsche Bundesbank, Riksbank Sweden

<sup>254</sup> Deutsche Bank, Royal Bank of Scotland, CartaGo, I. Grigg, E. Alyanikian, A. Weber, R. Lowrie-IBM

<sup>255</sup> Erste Bank

<sup>256</sup> I. Grigg

A certain threshold at which the substitution of reserve money would pose a "threat" to monetary policy does not exist<sup>257</sup>. Of course, the effect of e-money on monetary policy and on seignorage revenues is likely to be negligible during its initial stages.

At the strategic level, changes in the information content of monetary aggregates cannot be excluded; however they should not be dramatic, at least in a situation when e-money grows gradually.

### **6.3.5 Are the measures proposed to secure the central banks' hold on the money market sufficient, and what do these measures cost?**

The costs of the measures applicable are lower than those for monitoring real money<sup>258</sup>. According to the Deutsche Bundesbank, at the operational level, the measures proposed to secure the central banks' hold on the money market should be sufficient. A reserve requirement or coverage requirement should be able to ensure the central bank's ability to control the money market rate. It would be almost nil, as since January 1, 1999 the reserve requirement balances are remunerated at the money market interest rate. Furthermore, issuers always hold working balances to honour the e-money returned by the retailers.

The point to make here is probably that substituting e-money for notes involves a loss of seignorage - the central bank loses non-interest-bearing liabilities (notes) and interest-bearing assets (e.g. money market paper). This loss can only be avoided if:

- (a) the central bank itself issues the e-money, or
- (b) it substitutes in its own balance sheet **non-interest-bearing** reserve requirements.

Both seignorage and non-interest-bearing reserves are forms of taxation.

Seignorage provides a major incentive to substitute e-money for notes; the issuers and users of e-money can share the seignorage between them. But if the tax has to be made up in other ways (because lower central bank profits are paid over to governments) that is a loss to payers of the relevant other taxes. In a world of free capital movements the tax implicit in non-remunerated reserve requirements can be avoided by going off shore - and the ECB has of course decided to remunerate required reserves. If the central bank has to expand its balance sheet by increasing remunerated reserves (or debt certificates with a market interest rate) it does not, by and large, recoup the loss of seignorage (the extra assets and liabilities are both interest-bearing).

One opinion<sup>259</sup> maintains that there is nothing central banks can do which will secure a "hold" on electronic money. The best they can do is to ensure that their own companies do not have free access and do not participate in the supply of such technologies. This opinion is based on "sufficient" empirical evidence with new Internet money schemes indicating that success will be of an international nature. The choice of jurisdiction appears to have only an indirect effect

<sup>257</sup> Deutsche Bundesbank

<sup>258</sup> Deutsche Bank

<sup>259</sup> I. Grigg

on the success of schemes. Although there is user popularity for local jurisdiction, this by no means limits the user base of any scheme that has demonstrated even marginal success. According to this opinion, “Internet money” is something that appears to not respond well to regulation, and any premature regulatory or jurisdictional pressure could have undesirable effects.

**6.3.6 If electronic money were to affect monetary policy-making, what measures would allow central banks to keep control of the money market?**

If electronic money becomes an important form of exchange, then it will include many of the features that are present with other parts of the financial system. For example, capital markets will exist with loan and equity instruments managed with the technology of Internet money. Central banks will be at liberty to conduct open market operations within their state currencies. That is, treasury issues of debt interest rate policy, or exchange rate policy, as desired. Overnight rates can be set for Internet funds on short-term deposit, just as they are with account money<sup>260</sup>.

As outlined previously, according to the U.S. Federal Reserve it is unknown whether the issuance of electronic money could provoke an increase in interest rate volatility with adverse effect on financial markets and the economy. However, if interest rate volatility were to increase substantially, the Federal Reserve considers taking a number of steps to help contain the increase, though at the same time it also considers that some of the options might require legislation.

A certain risk for monetary policy is seen in network money<sup>261</sup>. In the event the issuers of network money are operating from an offshore-financial centre and the volume reaches a substantial amount, that could have a serious impact on monetary policy. In this case, the statistical reporting obligation could not be implemented, the indicator quality of monetary aggregates would weaken, and monetary expansion would be possible without central banks having direct control over it.

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<sup>260</sup> I. Grigg

<sup>261</sup> Deutsche Bundesbank

## 7. Conclusions and recommendations

1. There is wide consensus among experts on the effects of several factors to the deployment of e-commerce which are not directly related to the security of electronic payment systems. The most important include, among others, cultural, generational, linguistic and computer literacy barriers, as well as growth factors related to the penetration of internet infrastructure, to telecommunication costs, to the added value of on-line business solutions, to standardisation and finally to legal issues, in particular regarding consumer protection.
2. Experts appear to be deeply divided about the effects of the security of electronic payment systems on the growth of e-commerce, about the need for sophisticated security solutions, such as SET (Secure Electronic Transactions) and about the future prospects regarding the consumers' preferences and demand for on-line micro-payment systems.
3. Trust and confidence among the parties to a transaction appear to be commonly acceptable key requirements for the growth of e-commerce. However, the understanding of the underlying factors to the generation of trust and confidence varies widely and there is a clear need for analytical field research in this area.
4. Regarding consumer protection issues in relation to e-commerce, banking and payment systems, there is a strong need for better understanding of the effects of implementing existing provisions at EU level. In addition, comparative studies with the situation in the USA are needed to highlight increasing claims about a "effective" consumer protection in the USA by legal means, which allows e-commerce to grow substantially with conventional payment systems and makes the need for advanced technical security solutions less evident.
5. In the EU, there is presently a clear preference towards increased security through technical means, e.g. software and hardware solutions which are currently proliferating. The EU Member States still differ very much as to the legal provision applicable and the main type of infrastructure used for payments. In this respect, experts generally identify a pronounced need for systematic action for the completion of the internal market through the targeted development of EU-wide measures and standards.
6. On EMU and the current prospects for cross-border e-commerce, experts tend to agree that the introduction of the Euro will only lead to a moderately wider spread of cross-border payments and e-commerce in Europe. The advantages of the elimination of exchange rate fees and risks are strongly counterbalanced by intrinsic barriers related to e-commerce development and to the existing legal uncertainties in cross-border jurisdiction.
7. On standardisation, experts agree that, government should not undertake this. It might be stimulated, but regulators should not intervene with respect to the content. Here, the role of the regulator is perceived to be particularly difficult. In this light, a key issue appears to be in the promotion of existing initiatives, such as the HBCI in Germany (Home Banking Computer Interface) or the OPT at international level (Open Trading Protocol), leading to the establishment of an inter-banking and e-commerce framework across the EU.
8. Monetary policy and stability concerns are not particularly alarming, at least for the foreseeable future and as long as reporting by the issuers of electronic payment systems to monetary authorities takes place in a systematic and comprehensive way. Here, the applied definitions of electronic payment systems are a key issue, as practically these determine the amount of supervision work by monetary authorities and thus the overall sustainability of the systems. Another issue is the regulatory option that some business processes do not by definition have to

be carried out by banks. This is seen by many players as a positive step forward. However, in the case of the issuance of electronic money the banking world remains rather sceptical. Their concerns refer to the protection of consumers, the soundness of issuers and integrity of financial markets and also include aspects related to potential risk of fraud and money laundering. On the other hand, the supporters of the issuance of e-money by non-banks expect this solution to favour innovation and competition.

9. Finally, the study's results confirm that experts perceive a general need for a systematic, structured and transparent information exchange among key experts and players at EU level. To this end, the current *ad-hoc* exercise could provide a starting point for a European Information System on Electronic Payment Systems and Commerce, which could be operated under the auspices of the European Parliament. The basic operating concept for this Information System would centre on a periodic and balanced updating of the key policy questions to be addressed to experts and interested parties, in order to produce several types of deliverables including newsletters, reports, executive notes and case studies.

## **Annexes**

## **Annex 1**

### **Personal Communications to IPTS** (in chronological order)

Patrice Peyret, Sun Microsystems, Palo Alto, 21 December 1998

M. S. Manasse, DEC, 22 December 1998

H. Kenens, Cera Bank, Belgium, 25 December 1998

Mark Zalewski, Director Global Business Development, Cybercash, USA, 29 December 1998

H. Konstapel, Konstapel Consulting BV, 29 December 1998

Hans-Bernhard Beykirch, SIZ Informatikzentrum der Sparkassenorganisation GmbH, Bonn, 5 January 1999

Edmond Alyanakian, BBS, Oslo, 6 January 1999

David Jessop, Royal Bank of Scotland, 7 January 1999

Ross Anderson, University of Cambridge, 8 January 1999

Walter Skoeldefors, Svensk Handel, Sweden, 8 January 1999

H. Schuld, e-business solutions - Global SmartCard Solutions - EMEA Sales Manager, IBM Germany, 12 January 1999

Eric Blot-Lefevre, President, E-commerce Europe, Paris, 14 January 1999

Marylin Choy, Deputy General Manager, Banco Central de Del Peru, Lima, 14 January 1999

Hans-Juergen Friedrich, Bundesbankdirektor, Leiter der Hauptabteilung Zahlungsverkehr, Kontenführung, Deutsche Bundesbank, 19 January 1999

Jill Paterson, Senior Analyst, Market Infrastructure Division, Bank of England, 12 January 1999 and 1 April 1999

Christoph Baert, EU Affairs Adviser, Europay, Waterloo, 18 January 1999

S. Gazziano, Robotics and Technology Division, ENEA, Rome, 18 January 1999

P. Janson, Manager IT Solutions, IBM Zurich Research Laboratory, Zurich, 18 January 1999

Richard Lowrie, IBM Global Services, Consulting Group, Banking, Finance & Securities, e-business South Bank, UK, 18 January 1999

Richard L. Field, Law Office of Richard Field, Cliffside Park, NJ, 19 January 1999

Alfred Schmauss, Vice President for Payment Systems, Erste Bank der Oesterreichischen Sparkassen AG., Wien, 19 January 1999

Enrique Rodriguez Bonachera and Jose M. Perez Soria, New Technologies Manager, Sermepa, 19 January 1999 and 29 March 1999

Karl-Heinz Achinger, Chairman, Debis Systemhaus, Deutschland, 20 January 1999

S. Dewal, O. Witmann and D. Woelfing, debis Systemhaus - Finanzdienstleistungen, Düsseldorf, 20 January 1999

Jeffrey Mann and Alexander Kopriwa, Program Directors (Europe), Advanced Information Management Strategies, META Group, 20 January 1999

Carlos Gomez, Director of Technology, Sistema 4B, S.A, Madrid, 20 January 1999

J. M.Vale, Head Payments Policy, Reserve Bank of Australia, 20 January 1999

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Chris De Noose, Karoline von Richthofen: Observations of the European Savings Banks Group (ESBG) on the "Study on Electronic Payment Systems on behalf of the European Parliament", Brussels 21 January 1999

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Andrew Drapp, Hitachi Ltd, Japan, 27 January 1999 and 14 April 1999

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Claude Boule, Groupe Bull - European Affairs, Louveciennes, 7 February 1999  
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Hans-Dieter Schaefer, Generalsekretar, CEDI (Confédération Européenne Des Indépendants), Bexbach, 12 February 1999

Jon Prideaux, Visa Europe Office, 16 February 1999

Alan Greenspan, Chairman, Board of Governors of the Federal Reserve System: Staff Response to European Parliament Questions on Electronic Payment Systems. Washington DC, 17 February 1999

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## Annex 2

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**Annex 4**  
**Contributed by DGXV, European Commission (in French)**

**Activités UE et hors UE dans le domaine  
de la société de l'information  
et du commerce électronique**

*Mise à jour fin 1998*

**I – TABLEAU SYNTHÉTIQUE DES TRAVAUX DE L'UNION EUROPÉENNE**

Les DG- chefs de file	Les thèmes	Le calendrier prévisionnel
DG XV	<p><u>Suite de la communication “ une initiative européenne sur le commerce électronique”:</u></p> <ul style="list-style-type: none"> <li>- Proposition de directive “transparence”</li> <li>- Proposition de directive “accès conditionnel”</li> <li>- Communication sur les communications commerciales</li> <li>- Proposition de directive sur la signature digitale (avec la DG XIII)</li> <li>- Communication sur les marchés publics: suivi livre vert-programmes SIMAP</li> <li>- 2 propositions de directive sur les aspects prudentiels de la monnaie électronique</li> <li>- Communication « un cadre d'action pour lutter contre la fraude et la contrefaçon des moyens de paiement, autres que les espèces</li> <li>- Proposition de directive sur les contrats à distance de services financiers entre fournisseurs et consommateurs.</li> </ul>	<p><u>Poursuite du programme</u></p> <ul style="list-style-type: none"> <li>- adoption formelle : 20 juillet 98- date limite transposition: 5/8/ 99</li> <li>- adoption par la Commission le 9/11/98</li> <li>-adoptée le 4 mars 98- plusieurs réunions du groupe des experts en 99</li> <li>- adoptée par la Commission le 13 mai 98 - Plusieurs réunions au conseil en 99- Avis du Parlement en plénière le 11/1 99</li> <li>- adoptée le 11 mars 98-projet SIMAP en cours- proposition législative en été 99 incluant e-procurement</li> <li>- adoptées par la Commission le 29 Juillet 98- plusieurs réunions du groupe du Conseil en 99</li> <li>- adoptée par la Commission le 1/7/ 98- Adoption de la proposition de plan d'action au Conseil Justice/Aff int de novembre 98</li> <li>-adoption par la Commission le 14/10/98</li> </ul>

<p>DG XV</p>	<ul style="list-style-type: none"> <li>- Proposition de directive : droit d'auteur et droits voisins dans la société de l'information</li> <li>- Projet de directive sur le cadre réglementaire du E-commerce</li> <li>- Etude sur la protection des données à caractère personnel dans les services en ligne.</li> <li>- Projet dans le 5ème programme cadre RDT (avec DGs III et XIII)- intégration de « Privacy enhancing technologies » dans le programme sur les technologies pour la société de l'information</li> </ul>	<ul style="list-style-type: none"> <li>- Plusieurs réunions du groupe de travail au Conseil- travaux au Parlement en cours</li> <li>- adoptée par la Commission le 18/11/ 98- groupes au Conseil les 15/ 21 janvier et 12 et 19 février</li> <li>- disponible</li> <li>- en cours d'élaboration</li> </ul>
<p>DG III</p>	<ul style="list-style-type: none"> <li>- Programmes d'action R et D &gt; société de l'information et PME-PMI</li> </ul>	<ul style="list-style-type: none"> <li>- En cours dans le cadre du programme Esprit.</li> </ul>
<p>DG IV</p>	<ul style="list-style-type: none"> <li>- Etude: l'impact des nouvelles technologies de la communication sur la politique de la concurrence</li> </ul>	<ul style="list-style-type: none"> <li>- En cours</li> </ul>
<p>DG V</p>	<ul style="list-style-type: none"> <li>- Actions de sensibilisation des entreprises au commerce électronique, dans le cadre du FSE et sur le fondement de la communication « People first- the next steps »</li> </ul>	<ul style="list-style-type: none"> <li>- à préciser</li> </ul>
<p>DG X</p>	<ul style="list-style-type: none"> <li>-Mise en oeuvre de la directive TVSF</li> <li>- La protection des mineurs et de la dignité humaine dans les services audiovisuels et de l'information.</li> <li>- Instauration d'une infrastructure d'information concernant l'industrie et les marchés des secteurs audiovisuels et connexes</li> <li>- Livre vert sur la convergence « télécom-audiovisuel-informatique »- Adopté en novembre 97</li> <li>- Livre vert sur les aspects culturels des nouveaux services</li> </ul>	<ul style="list-style-type: none"> <li>- Réunions périodiques du comité de contact</li> <li>- recommandation adoptée le 28 mai 98 .</li> <li>- Adoption en décembre 1997.</li> <li>- Rapport sur les résultats des consultations en juillet 98- projet de communication en 99</li> <li>- fin 99</li> </ul>

<p>DG XIII</p>	<ul style="list-style-type: none"> <li>- Projet de charte internationale-communication « « the need for strengthened international coordination » &gt; adoptée par la Commission début février 98</li> <li>- Livre vert sur la convergence “ télécom et audiovisuel”-adopté en novembre 97</li> <li>- Proposition de directive sur la signature digitale avec la DGXV</li> <li>-Suivi du programme pluriannuel pour stimuler mise en place société information</li> <li>- Dans le cadre du Programme Info 2000: Travaux du LAB: E-commerce</li> <li>-Action plan on promoting safe use of the Internet</li> <li>- Forum de la société de l’information (en liaison avec la DG III) * “la société de l’information-challenges et opportunités”</li> <li>- Coordination des travaux sur le commerce électronique Commission/Etats Membres (Avec DGs XV ET I)</li> </ul>	<ul style="list-style-type: none"> <li>- Création d’un « global business dialogue » et d’un « steering committee » &gt; réunion le 13 ou 14/1/99- Projet de <u>conférence internationale</u> en juin 99 à Vienne</li> <li>- Rapport sur résultats des consultations en juillet 98- projet de communication en 99</li> <li>- Adoptée par la Commission le 13 mai 98- Avis du Parlement en plénière le 11/1/99</li> <li>- Adopté en décembre 1997 Internet working groupe le 4/ 2/99</li> <li>- Réunions périodiques</li> <li>- Adopté par le Conseil le 21/12/98-</li> <li>* groupes de travail</li> <li>- Groupe ad hoc au conseil</li> </ul>
<p>DG XXI</p>	<ul style="list-style-type: none"> <li>-Implications du commerce électronique sur les règles concernant la TVA</li> </ul>	<ul style="list-style-type: none"> <li>- Communication de la Commission adoptée le 17/6/98</li> </ul>
<p>DG XXIII</p>	<ul style="list-style-type: none"> <li>- Etude sur l’impact du commerce électronique sur les secteurs du commerce et du tourisme</li> <li>- Etude sur le contenu et l’utilisation des sites Internet par les entreprises européennes</li> </ul>	<ul style="list-style-type: none"> <li>- 99</li> <li>- 99</li> </ul>
<p>DG XXIV</p>	<ul style="list-style-type: none"> <li>- Projet de plan d’action sur la protection du consommateur dans la société de l’information</li> </ul>	<ul style="list-style-type: none"> <li>- 99</li> </ul>
<p>3<sup>ème</sup> PILIER</p>	<ul style="list-style-type: none"> <li>- Lutte contre la criminalité sur Internet (travaux du P.8) en liaison avec le G.7. Projet de plan d’action avec recommandations en vue d’élaborer <u>une convention d’assistance mutuelle</u> et d’améliorer la coopération judiciaire et policière. Priorité donnée à la fraude aux moyens de paiement.</li> <li>- Cryptographie- identification des exigences pour l’accès aux clés de cryptage</li> </ul>	<ul style="list-style-type: none"> <li>- Travaux réalisés avec les services de la Commission</li> <li>- Groupe de travail –coopération policière-( SG-TFJHA, DG XIII DG XV)</li> </ul>

**II – TABLEAU DES ACTIVITÉS DE CONCERTATION INTERNATIONALE**

Les organisations internationales	Les thèmes de discussion	Les principales DG concernées	Le calendrier Prévisionnel
OCDE	<p>- <u>Conseil Ministériel notamment sur la société de l'information</u></p> <p>- Comité PIIC ( politique de l'information, de l'informatique et des communications)- préparation de la conférence d'Ottawa</p> <p>* Groupe de travail: Politique des télécoms et des services de l'information « accès aux infrastructures de l'information et leur utilisation pour le commerce électronique »</p> <p>* Groupe de travail : Sécurité de l'information et protection de la vie privée-</p> <p>* Groupe : Economie de l'information</p> <p>- Accès conditionnel dans les services de radiodiffusion par satellite numérique</p>	<p>- DG I- XV- III- XIII- X-XXI-XXIV</p> <p>- DG I –XV- XIII – III- X</p> <p>- DG I – DG XV- DG XIII</p> <p>- DG XV-XIII</p> <p>- DG XIII- XV-I-III- XXIV</p> <p>-DG XV-XIII</p>	<p>- calendrier à venir</p> <p>- calendrier à venir</p> <p>//</p> <p>- mars 99</p> <p>- calendrier à déterminer</p>
OMC	<p>- Programme de travail (dont modes de fourniture des services- privacy)</p> <p>- CTS ( councils for trades in services)</p> <p>- Marchés publics- adaptation accord OMC aux nouvelles technologies (code ou contrats types)</p>	<p>- DGs I-III-XIII-XV- XXI</p> <p>- DGs I-III-XIII-XV</p> <p>- DG XV – III</p>	<p>- adopté en septembre 98</p> <p>- fevrier- mars- avril-mai 99</p> <p>-Travail du comité sur marchés publics ou groupe transparence</p>
G-7/G-8	<p>- Lyon group (G 8) : sous groupes sur les nouvelles technologies/computer crime (cyber crime).</p> <p>- Commerce électronique et PME/ PMI ( programme d'aides en 10 propositions: "a global market place for the SMES- appui du programme Esprit)</p>	<p>- DG I -3ème pilier - DG XIII – XV</p> <p>- DG III- XV- XIII- XXIII</p>	<p>-<u>Conférence</u> au Texas en 99</p>

<p>OMPI</p>	<p>- La propriété intellectuelle: * protection des interprétations et exécutions audiovisuelles. *Protection des bases de données</p> <p>- Procédure OMPI pour les noms de domaine- relations avec IPR y compris règlement des conflits ente marques et noms de domaine- y compris aspects "data protection"</p>	<p>- DG XV</p> <p>- DG XV</p>	<p>* Plusieurs réunions du Comité d'experts en 99 *Plusieurs réunions du Comité d'experts en 99</p> <p>- rapport final et recommandations &gt; 1/ 3/ 99</p>
<p>CONSEIL DE L'EUROPE</p>	<p>- Impact des nouvelles technologies de la communication sur les droits de l'homme et les valeurs démocratiques(MM-S-NT)</p> <p>- Criminalité dans le cyber espace (comité PC-CY –Justice et Police)- Projet de convention Internationale.</p> <p>- Pluralisme dans les nouveaux médias (groupe MM-S-PL) &gt; préparation d'une recommandation</p> <p>- Comité permanent sur la convention européenne sur TV transfrontière</p> <p>- Groupe spécialistes sur la protection juridique des services à accès conditionnel ( MM-S-CA)</p> <p>- Protection ayants droit domaine des média – groupe MM-S-PR</p> <p>- Protection des personnes à l'égard de la collecte et du traitement des données à caractère personnel dans les inforoutes ( groupe CJ-PD)</p> <p>- Conférence sur la liberté d'expression et la protection de la vie privée</p> <p>- Comité directeur sur les moyens de communication de masses (CDMM))</p>	<p>- DG I- 3ième pilier- (DG XV)</p> <p>- DG I – 3ème pilier- DG XV</p> <p>- DG XV</p> <p>- DG X – XV – XIII</p> <p>- DG XV</p> <p>- DG XV- XIII</p> <p>- DG XV</p> <p>- DG XV</p> <p>- DG XV- X- I</p>	<p>- 2/4 février- 7/9 avril - 3/5 novembre 99</p> <p>- Comité d'experts en 99</p> <p>- 24/26 février- 20/22 octobre 99</p> <p>- 22/23 mars- 30/ 9 et 1/10 - 16/17 décembre 99</p> <p>- 27/29 janvier - 21/23 avril- 27/29 octobre 99</p> <p>- 3/4 mars- 1/3 septembre- 8/10 novembre 99</p> <p>- adoption finale en début 99 par le comité des Ministres</p> <p>- 22/24 septembre 99</p> <p>- 1/4 ou 8/11 juin à Lisbonne- 7/10 décembre 99</p>
<p>UNCITRAL</p>	<p>- Commerce électronique: *droit des contrats –élaboration de règles types * signature digitale</p>	<p>- DG XV – XIII</p>	<p>- Réflexion en cours au sein d'un groupe de travail.</p>

**III – TABLEAU DES ACTIVITÉS DE CONCERTATION BILATÉRALE**

Etats	Thèmes de discussion	Les DG principalement concernées	Calendrier prévisionnel
<p><b>USA</b></p> <ul style="list-style-type: none"> <li>- Sommet US/EU</li> <li>- Transatlantic economic partnership (TEP)</li> <li>- Transatlantic business dialogue (TABD)</li> <li>- Information society dialogue</li> <li>- EU /US joint study</li> </ul>	<ul style="list-style-type: none"> <li>- Le commerce électronique (suivi des travaux après la déclaration US/UE)</li> <li>- programme à déterminer</li> <li>- <u>Elargissement des travaux: télécom, Internet et commerce électronique.</u> 4 priorités :                             <ul style="list-style-type: none"> <li>* protection des données</li> <li>* cryptage et signatures digitales</li> <li>* propriété intellectuelle</li> <li>* taxes</li> </ul> </li> <li>- Projet de programme de travail du groupe “télécom” : interopérabilité, responsabilité des transporteurs, convergence audio/télécom...</li> <li>- Commerce électronique</li> <li>- Commerce électronique: * relevé des données économiques</li> <li>* état et évolution des législations internes et internationales</li> </ul>	<ul style="list-style-type: none"> <li>- DG I – XV – XIII – III</li> <li>- DG I-XV.....</li> <li>- DG I – XV – XIII</li> <li>- DG I – XIII</li> <li>- DG I –XV –XIII-III</li> <li>-DG I –XV-XIII-III</li> </ul>	<ul style="list-style-type: none"> <li>- A préciser</li> <li>- A préciser</li> </ul>
<p><b>JAPON</b></p> <ul style="list-style-type: none"> <li>- Sommet UE/Japon</li> <li>-Poursuite du dialogue informel engagé avec la DG XV</li> <li>- Groupe de travail sur la société de l’information</li> </ul>	<ul style="list-style-type: none"> <li>- Commerce électronique</li> <li>- Commerce électronique</li> <li>- Commerce électronique (initiatives des industriels, contenu illégal et préjudiciable, protection des données, signature digitale, cryptage)</li> </ul>	<ul style="list-style-type: none"> <li>- DG I / XV</li> <li>- DG I – XV</li> <li>- DG I – III</li> </ul>	<ul style="list-style-type: none"> <li>- Rencontres informelles régulières</li> <li>-A préciser</li> </ul>

#### IV. TRAVAUX DE L'UNION EUROPÉENNE CONCERNANT PLUS PARTICULIÈREMENT LES SYSTÈMES DE PAIEMENT, DONT LES SYSTÈMES ÉLECTRONIQUES

##### **Communication intitulée « Une initiative européenne dans le commerce électronique » du 16 avril 1997 {COM(97)157 final}**

Objet : Ce document identifie les principaux domaines où une action doit être entreprise pour que l'Europe puisse tirer parti de cette nouvelle forme de commerce qui se développe rapidement. Quatre objectifs fondamentaux sont présentés :

- > offrir un accès généralisé et à un coût raisonnable aux infrastructures nécessaires pour le développement du commerce électronique.
- > établir un cadre juridique favorable fondé sur les principes du marché intérieur.
- > susciter la création d'un environnement commercial favorable en développant la formation et l'information.
- > Créer un cadre réglementaire cohérent au niveau mondial.

##### **\* Communication « Assurer la sécurité et la confiance dans la communication électronique- vers un cadre européen pour les signatures numériques et le chiffrement »- COM (97) 503 final du 8 octobre 1997.**

Objet: développer une politique européenne visant, en particulier, à établir un cadre commun pour les signatures numériques, à assurer le fonctionnement du marché intérieur pour les produits et services cryptographiques et à stimuler l'industrie européenne des services et produits cryptographiques.

##### **\* Proposition de directive sur les signatures numériques du 13 mai 1998- COM (98)29 final - suite de la communication du 8 octobre 1997 {COM (97) 503 final}**

Objet : mettre en place un cadre commun à ces techniques dans l'Union Européenne.

Calendrier : Adoption au Conseil attendue pour début 1999.

##### **\* Communication et recommandation concernant les opérations effectuées au moyen de paiement électronique, en particulier la relation entre émetteur et titulaire » du 9 juillet 1997- COM 97/353 et 97/489/ CE**

Objet : Etablissement dans les relations entre titulaires et émetteurs de cartes de paiement, d'un certain nombre de règles minimales en matière d'information et de responsabilités réciproques. Ces textes qui concernent tous les instruments de paiement électronique (instruments d'accès à un compte et instruments de monnaie électronique) et ils :

- définissent des obligations minimales de fourniture d'informations avant la conclusion d'un contrat et après chaque opération réalisée au moyen de ces instruments,

- définissent les droits et obligations respectifs des parties dans le cadre de l'utilisation des moyens de paiement (notamment, dans le cas de perte ou de vol de l'instrument),
- et recommandent aux Etats membres de mettre en place le cas échéant les mesures légales appropriées et de veiller à l'existence de moyens de recours et de réclamations à l'amiable en cas de litiges entre émetteurs et titulaires.

**\* Propositions de directives : - concernant l'accès à l'activité des institutions de monnaie électronique et son exercice, ainsi que la surveillance prudentielle de ces institutions.COM 98 / 461 final du 21 septembre- 98/O2/ 52 COD**

**- modifiant la directive 77/ 780/CEE visant à la coordination des dispositions législatives, réglementaires et administratives concernant l'accès à l'activité des établissements de crédit et son exercice- COM 98 / 461 final du 21 septembre – 98/ O2 / 53 COD**

Objet : permettre aux établissements non-bancaires d'émettre de la monnaie électronique sous certaines conditions, aboutissant ce faisant à la définition de « nouvelles » institutions, non bancaires, mais soumises à une certaine surveillance prudentielle du fait de leur activité d'émission de monnaie électronique. Pour ce faire, le premier texte assure une harmonisation minimale du régime prudentiel de ces établissements, à l'image des règles applicables au secteur bancaire.

Calendrier : Adoption par la Commission le 29 juillet. Transmission au Parlement et au Conseil le 21 septembre. Premier groupe de travail au Conseil le 19 octobre 98.

**\* Communication « un cadre d'action pour lutter contre la fraude et la contrefaçon des moyens de paiement autres que les espèces » du 1er juillet 1998 COM (1998) 395 final**

Objet : proposition d'un cadre d'action en deux volets :

- proposition d'action commune du Conseil, visant notamment à garantir que la fraude et la contrefaçon des moyens de paiement autres que les espèces soient érigées en infractions pénales dans tous les Etats membres ; et

- proposition d'une série d'actions préventives, en invitant toutes les parties intéressées (industrie des services financiers, autorités nationales, organisations des consommateurs, opérateurs des consommateurs, opérateurs de télécom, etc...) à soumettre leurs commentaires à la Commission avant le 31 décembre 1998.

**\* Suivi de la Communication « un cadre d'action pour lutter contre la fraude et la contrefaçon des moyens de paiement, autres que les espèces »- 1er juillet 98 COM (98) 395 final – Proposition d'action commune du Conseil**

Objet : Premier volet du cadre d'action: une proposition d'action commune du Conseil, visant notamment à garantir que la fraude et la contrefaçon des moyens de paiement autres que les espèces soient érigées en infractions pénales dans tous les Etats membres.

Calendrier : Adopté au Conseil Justice/Affaires Intérieures en novembre 98.

**\* Suivi de la Communication « un cadre d'action pour lutter contre la fraude et la contrefaçon des moyens de paiement, autres que les espèces » 1er juillet 98 COM (98) 395 final : Projet d'actions préventives**

Objet: Deuxième volet du cadre d'action: proposition d'une série d'actions préventives, en invitant toutes les parties intéressées (industrie des services financiers, autorités nationales, organisations des consommateurs, opérateurs de télécom, etc...) à soumettre leurs commentaires à la Commission.

Calendrier: Soumission des commentaires à la Commission avant le 31 décembre 1998.

**\*Directive sur la transparence réglementaire pour les services de la société de l'information 98/48/CE- (JO L-217 du 5/8/98 p 18)**

Objet: mise en place d'une procédure d'information et de consultation par laquelle les futurs projets de réglementations nationales visant spécifiquement les services de la société de l'information devront être notifiés à la Commission et aux autres Etats membres. L'examen de ces réglementations nationales, prévue pendant une période initiale de trois mois, devrait permettre de vérifier leur compatibilité avec le droit communautaire et l'éventuelle nécessité d'une action réglementaire au niveau communautaire.

Les services de l'information sont ainsi définis : ils sont fournis par voie électronique, à distance et à la demande individuelle d'un destinataire de services.

Délai de transposition: 5 août 1999

**\* Proposition de directive relative à certains aspects juridiques du commerce électronique dans le marché intérieur**

Objet: clarifier et/ou d'harmoniser au niveau communautaire certaines questions juridiques « horizontales » qui pourraient éventuellement concerner, par exemple, certains aspects du régime d'établissement (ex. définition du lieu d'établissement du fournisseur de services, le pays d'origine,...), certains aspects relatifs aux régimes de la responsabilité, des contrats, des communications commerciales (publicité, parrainage), des professions réglementées, le règlement extra-judiciaire des conflits, .....

Calendrier: Transmission au Parlement et au Conseil fin 1998.