

## Electronic banking from a prudential supervisory perspective

Recent developments in information and communications technology (ICT) and the rise in the volume of banking business transacted electronically are causing what will be a lasting impact on the business policies of financial institutions and on their risk situation.

The present article not only deals with developments in the banking sector but goes on to discuss, in particular, the way electronic banking influences the risks assumed by credit institutions and financial services institutions. The specific design of the technical security infrastructure is proving to be a key factor. The changed risk situation of the institutions active in this sector also has implications for the prudential supervisory approach, which will have to be adapted to new developments. Given the cross-border nature of electronic banking, banking supervisors cannot afford to restrict themselves to passing national rules and measures. Quite the opposite: it has become more important than ever before to intensify international coordination and cooperation among banking supervisory agencies. More generally, electronic banking – like other areas subject to prudential supervision – is undergoing trends which require supervisors to gear their work more towards qualitative aspects that take due account of the specific situation of each individual institution.

## Electronic banking as a segment of electronic commerce

*E-banking and  
e-commerce*

Electronic banking (referred to hereafter as "e-banking") is a key segment of electronic commerce ("e-commerce"), which, in turn, encompasses all types of business transacted through electronic networks. Electronic channels are used for both business-to-business and business-to-customer transactions, such as ordering goods, delivering software or paying for such transactions. E-banking is considered to be a segment of e-commerce to the extent that banks are involved in the conduct of business transactions via electronic media; other non-banking financial products and services (e.g. insurance), not to mention products and services from other sectors of business, may be sold electronically as well.<sup>1</sup>

In other words, e-banking is not a banking product; rather, it describes the way transactions are conducted. Nowadays, in fact, banks are involved in e-commerce in a variety of ways, including cooperation with Internet service providers (ISPs), the issuing of e-money or the execution of payments.

Since the current importance of e-commerce and its growth prospects have been exhaustively analysed in various studies (see, for example, the charts on page 45), they will not be discussed in this article. Nearly all research on this subject suggests that e-commerce will have a huge potential for growth in the coming years. Most of these forecasts, though, presuppose the existence of secure and efficient settlement systems.

The terms "PC banking", "online banking", "Internet banking", "telephone banking" or "mobile banking" refer to a multitude of ways in which customers can access their banks without having to be physically present at a bank branch. E-banking may be understood as a catch-all term which covers the different ways of transacting banking business electronically. At the moment, the attention of banking supervisors is focused on the increasing digitalisation of retail business. Wholesale services, most of which is being conducted electronically, is governed by other business and prudential requirements and will not be discussed in this article.

*Definition  
and types of  
e-banking*

"PC banking" is the term used for banking business transacted from a customer's PC. The exchange of data involved, for instance, in the transmission of orders for credit transfers to the bank is effected via phone lines (either analog – by modem – or using an ISDN adapter). Basically, there are two types of PC banking.

*PC banking*

The first type is online banking,<sup>2</sup> in which bank transactions are conducted within closed networks. The customer needs specialised software provided by his bank. This type of PC banking could already be found in Germany in the early eighties (known then as the

<sup>1</sup> Electronic money (e-money) is not discussed in this article. This topic was dealt with extensively in the Monthly Reports of June 1999, "Recent developments in electronic money", and March 1997, "Monetary policy and payment systems", as well as in a discussion paper of the Economic Research Group of the Deutsche Bundesbank (5/99), "Network money as a medium of exchange".

<sup>2</sup> Often, for simplicity the general public and some of the relevant literature use the term "online banking" to mean Internet banking as well. The term "online accounts" refers to accounts operated on the Internet as well as those operated in closed networks.

BTX system of the German Federal Post Office). The second type is Internet banking, which German banks have been offering since the mid-nineties, although the only product they were offering at the time was information. Unlike closed networks, Internet banking permits the customer to conduct transactions from any terminal with access to the Internet.

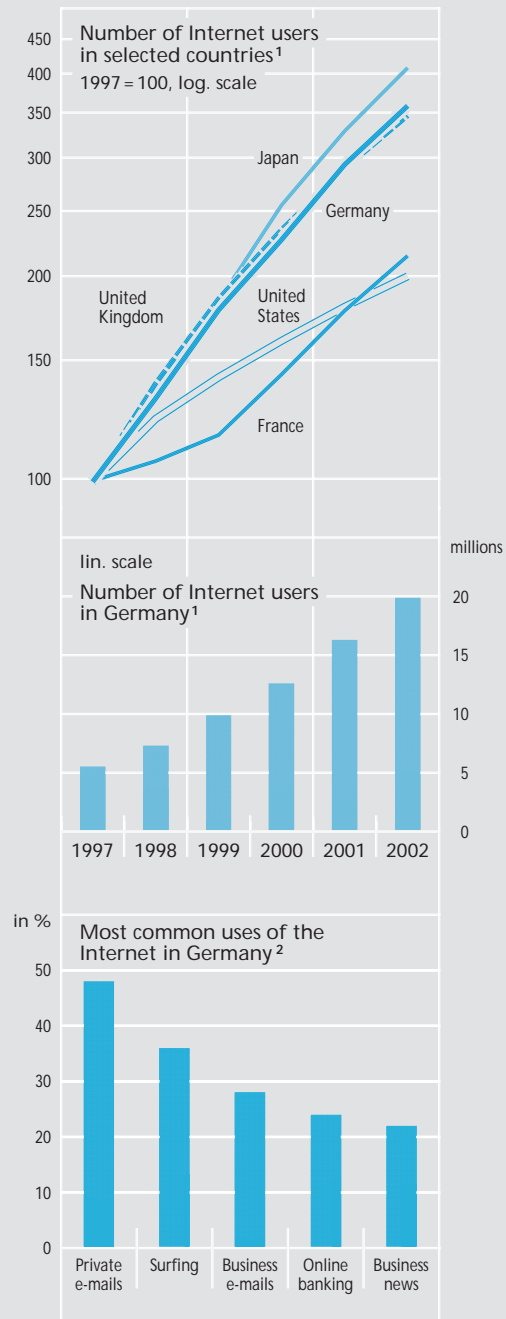
*Mobile banking*

Mobile banking is a vivid example of how the lines between the various forms of e-banking are becoming increasingly blurred. Thanks to new transmission technologies such as WAP (wireless application protocol), portable terminals such as mobile phones, personal digital assistants (PDAs) or small hand-held PCs are providing bank customers with access to the Internet and thus paving the way to Internet banking. As a result, Internet banking has become more than just a form of PC banking.

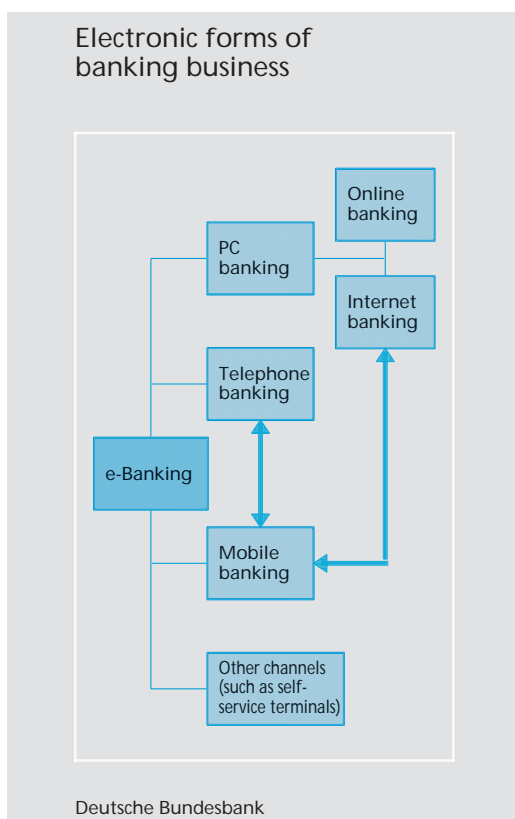
The general tendency, encouraged by mobile commerce, is for the Internet and telecommunication sectors to converge, giving banks a further – wireless – access channel for conducting banking business. However, the use of mobile terminals is still in its infancy. The slower transmission speed of the WAP standard and the limited amount of information available are just two of the factors inhibiting the use of those terminals.

This has led some pundits to dismiss WAP as merely an interim standard which, in the medium term, will likely be superseded by the much faster UMTS (universal mobile telecommunication system) standard. The large

The Internet – an engine of growth for e-banking



<sup>1</sup> Source: European Information Technology Observatory (EITO), 1999, page 407, and the Bundesbank's own calculations. —  
<sup>2</sup> Source: GfK Medienforschung, survey of people between ages 14 and 69, as of August 2000.



amounts paid for UMTS licences at the recent auction in Germany reflect the tremendous market potential which some major telecommunication enterprises see in this new standard.

### Business considerations behind e-banking

#### Efficiency gains

Commercial banks which successfully meet the challenges posed by technological change will find a multitude of new opportunities to expand their market position. First, the digitalisation of transactions makes it possible to reduce costs and increase efficiency, although extensive investment in information technology (IT) will initially be required. Whereas some years ago IT advances were mainly ex-

pected to cut internal business costs, today the goal is to use technology to make the entire range of business operations more efficient.

One ancillary effect of technological progress is the continuing tendency towards increased standardisation of banking products and services. This trend, known as "commodisation", may have positive implications for banks in the form of potential efficiency gains, although customer loyalty may well decrease further in the wake of intensified competition.

Second, Internet banking, in particular, will allow credit institutions to make further inroads into new fields, acting, for example, as certification authorities<sup>3</sup> on electronic marketplaces. This reveals one of the positive sides of increasing competition. By cooperating, for example, with ISPs, telecoms, software manufacturers or other non-banks, fast and flexible banks may take advantage of "cross-selling effects" to offer personalised solutions to their customers and so will be better able to capitalise on existing customer potential and to win over new customers.

*Making inroads into new fields*

<sup>3</sup> Banks active in these fields provide special security services, such as issuing certificates, to interested parties. With such certificates, the customers can positively identify themselves to their counterparties using a personal digital signature. The four largest German banks each acquired a 25% share in the security services provider "TC TrustCenter" in June 1999, thus laying the groundwork for a joint certification authority consisting of private banks (see Federal Association of German Banks (*Bundesverband deutscher Banken*), *E-Commerce als Bankdienstleistung, Daten, Fakten, Argumente*, October 2000, page 34 (available only in German)).

Reaching out  
to new and  
attractive  
customer  
segments

Third, banks can reach out to new and attractive customer segments. According to a current market research study,<sup>4</sup> nearly one-third of domestic residents between the ages of 14 and 69 log on to the Internet at least occasionally, and this group is increasingly using the Internet in order to conduct banking transactions. This customer segment is of particular interest to banks since Internet users, as determined by the study, have an above-average level of education and are located, more importantly, in the higher-income brackets.

Focusing  
on core  
competencies

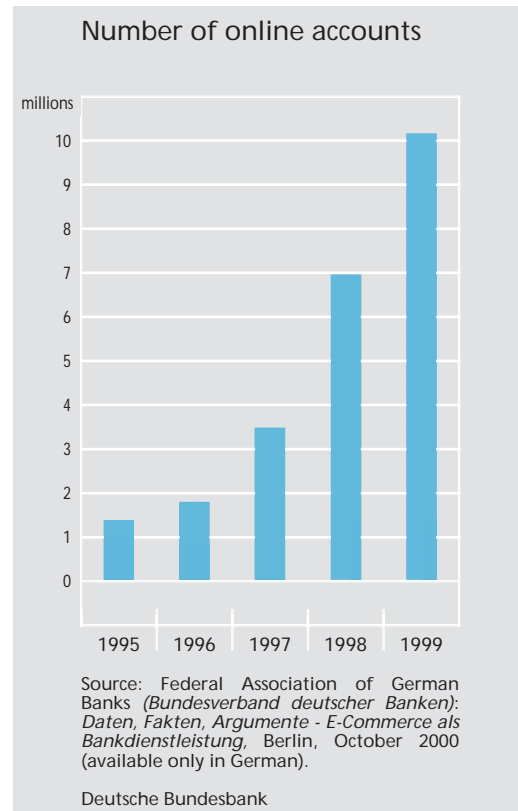
Fourth, exploiting the potential of the Internet – by participating in portals<sup>5</sup>, for instance – will facilitate cooperation with partners from the banking and non-banking sectors, to whose websites links can be set up. Outsourcing makes it possible for partners to focus on their core competencies.

Data mining

Finally, within the limits set by data and consumer protection requirements, the electronic transaction of business opens the door for data mining in order to detect payment patterns, for instance. This, in turn, enables banks to offer one-to-one banking services once they have established such databases and developed data mining strategies; in this type of banking, customers are offered personalised products and services based on their customer profiles.

### Trends in the German banking industry

At the end of 1999 there were some ten million online bank accounts in Germany, up by

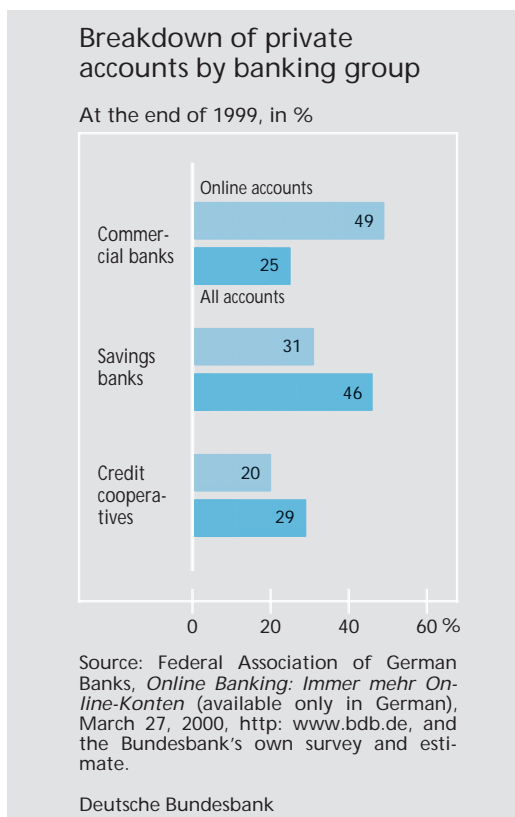


around 45% from the previous year (see above chart). Compared with the total number of bank accounts held in Germany (approximately 84 million),<sup>6</sup> the share accounted for by online accounts, presently around 12%, is still relatively minor. However, mutually confirming estimates point to a large potential for future growth, which is likely to ride atop the continued increase in Internet usage.

<sup>4</sup> See: Gesellschaft für Konsumforschung (GfK), *Online-Monitor*, 6. *Untersuchungswelle*, August 2000 (available only in German).

<sup>5</sup> Portals are web pages serving as points of entry for surfers, e.g. the home pages of online services or search engines. They provide the Internet user with the desired information immediately and serve as a platform from which to hit other websites.

<sup>6</sup> These figures derive from the Deutsche Bundesbank's own surveys and estimates.



*Trend towards Internet banking*

According to a new market research study,<sup>7</sup> already 39 % of German Internet users are engaged in Internet banking or online banking. Another 27 % of Internet users said they had seriously considered the possibility of e-banking on their PCs. The trend towards greater use of the Internet has also been confirmed by figures published by the Federal Statistical Office<sup>8</sup> on the amount of new information technology equipment to be found in households. This hardware is being used more and more for logging on to the Internet. On the whole, the share of households with Internet access has more than doubled over the last two years and is currently just shy of 30 %.

*Product range ...*

The products and services now being offered electronically are still restricted, in the main,

to those areas which lend themselves to being sold electronically thanks to their high degree of standardisation (account-keeping/payments, securities transactions and information gathering). Other services or transactions which require more personal consultation, such as mortgage lending or asset management, will probably continue to be sold for the most part through banks' branch networks in future. This makes it necessary for banks to maintain both sales channels. The vast majority of Germany's banks are pursuing this multi-channel strategy, which acknowledges customer preferences. Owing to the potential increase in expenditure, the profitability of some banks will suffer if banks are not equally successful in using electronic marketing to extend their sales activities or to open up new markets and solicit new customers (see also "Business considerations behind e-banking", page 46 f.).

*... and multi-channel strategy*

Clicks-and-bricks banks, which integrate Internet/online-based sales with branch-based sales, have the advantage of being able to make use of an existing customer base. In addition, such established institutions have a brand name with a solid reputation on the market and a stock of goodwill that new competitors must first earn. However, parallel sales channels, as explained above, entail higher administrative costs.

*Clicks-and-bricks banks*

<sup>7</sup> Federal Association of German Banks and Forschungsgruppe Wahlen Online GmbH: *Studie zum Internet-Online-Banking/e-Commerce*, October 2000 ([www.bdb.de](http://www.bdb.de), [www.fwg-online.de](http://www.fwg-online.de)) (available only in German).

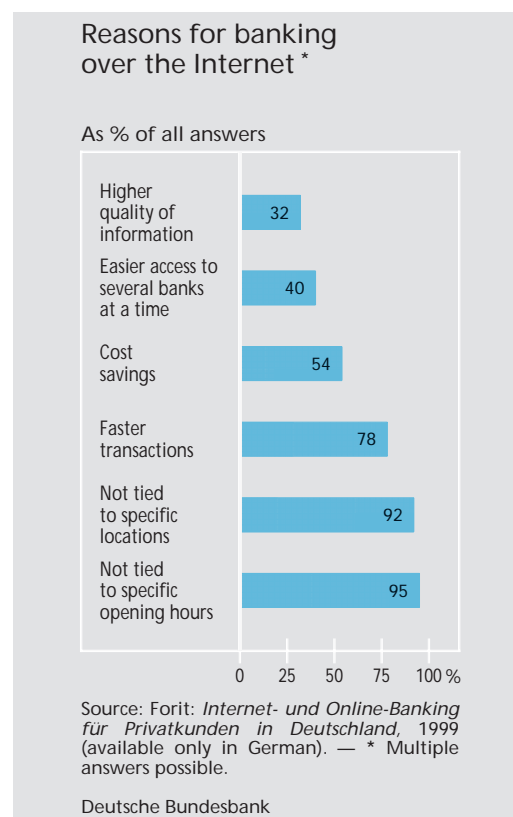
<sup>8</sup> Press release issued by the Federal Statistical Office on September 25, 2000.

*Direct banks*

In addition to pursuing the two-pronged approach combining bricks-and-mortar operations with electronic sales channels, some banks have established what are known as direct banks. They have deliberately sought to avoid maintaining a costly and labour-intensive network of branches by providing their services electronically 24 hours a day, seven days a week. These "direct banks" differ from one another in the brand name used (sometimes without mention of the parent institution), the range of products offered and the degree of personal consultation. Direct banks are under considerable competitive pressure, especially owing to the high degree of market transparency which technological advances have made possible.

*Direct brokers*

Direct brokers are a special type of direct bank. They specialise in cost-effective securities management, mostly without personal consultation. Until just a few years ago, the fact that there was relatively little private ownership of stocks in Germany kept retail brokerage from achieving a major breakthrough. Now, though, in the wake of the large waves of privatisation and the early success of the Neuer Markt, and with reform of the system of old-age provision pending, change seems imminent. At the end of 1999, the four largest direct brokers in Germany handled 13 % of German stock sales. This is somewhat less than the corresponding figure for the United States (16%).<sup>9</sup> A pan-European comparison shows German direct banks to be ahead by a wide margin: all five of Europe's largest institutions are German.<sup>10</sup>



Recently, some institutions have branched off into other European countries. Moreover, some direct banks, through cooperation agreements or acquisitions, are seeking to gain a toehold in other business areas, such as the insurance or investment business.

If individual banking groups are compared in terms of the trend in the percentage of private e-banking accounts held, it becomes evident that private commercial banks are active in e-banking business to an extent out of proportion to their numbers. One probable reason is that direct banks, which are usually subsidiaries of private commercial

<sup>9</sup> Standard & Poor's, *European Banks Face Up to the Internet*, August 9, 2000.

<sup>10</sup> *Börsenzeitung, DAB übernimmt Self Trade*, September 14, 2000 (available only in German).

banks, entered the market early. Another is that those institutions, often specialising in brokerage, have benefited from the dynamic growth of securities markets over the past few years and the nascent "shareholder culture" in large segments of the German population.

### Characteristics of e-banking relevant to banking supervisors

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With business processes becoming increasingly digitised, business models, and, with them, the risk structure of credit institutions, are changing. The following characteristics of e-banking are therefore at the centre of banking supervisors' interest.

#### *Characteristics of e-banking*

E-banking ...

- transcends sectors and national borders: owing to the virtual nature of electronic commerce, the transaction of banking business is no longer confined to national borders. Much the same applies to the relationship between bank products and non-bank products. That means supervisors will need to cooperate even more closely with foreign supervisory authorities than in the past.
- depends on IT: the secure and efficient deployment of ICT will become a crucial strategic factor in the success of electronic banking. Every stage in the value-added chain, from development through production to the marketing of financial products, is dependent on IT. Most importantly,

this dependency, coupled with the innovative momentum of the Internet, will increase the strategic and operational risk faced by banks.

- is dynamic: the innovation cycles for new products on the Internet are becoming shorter and shorter due to the rapid pace of technological change. In some cases, the technology behind some products is already obsolete well before those products are ready for marketing, or those products end up no longer marketable due to changed customer preferences.
- is customer-oriented: technology and increased market transparency will reduce the previous asymmetry of information between the bank and its customers. Thus, the existence of the Internet is causing the balance of power on the market to shift towards customers. Customers are becoming ever more mindful of this fact and are expecting not only price advantages but also that their e-banking providers give them a very high quality of service (e.g. round-the-clock availability, short answering times, ease of handling; see chart on page 49).
- enhances competition: several factors have conspired to induce this effect. The greater ease with which prices and products can be compared has enhanced market transparency; the market entry barriers for new competitors have been lowered; the spatial and temporal constraints on competition have been removed; Internet or online banking cus-



tomers display little brand loyalty; and e-banking customers are focusing ever more on costs and profit margins.

The change in consumer behaviour and the competition-enhancing effect of e-banking have affected the banks' risk situation and profitability, necessitating surveillance by banking supervisors.

## E-banking risks

Apart from the above-mentioned opportunities which IT innovations have afforded to banks and other financial services providers, banking supervisors are primarily studying the risks involved in e-banking. E-banking is causing a shift in the weighting of existing risk categories towards those risks arising from the increased use of IT.

### *Strategic risks*

Strategic risks result from (bad) business decisions taken by management. Specifically, the danger of not being able to keep up with rival technologies is the source of the greatest strategic risk. Technology is so important for e-banking operations that there is a correspondingly great need to invest in new technologies. Innovators assume most of the risk. It is often impossible to foresee whether a new product will survive on the market or whether a project can be successfully brought to conclusion. Failed IT projects can raise the amount of misallocated investment; thus, instead of reducing costs, e-banking would have precisely the opposite effect.

## Prudential supervisory aspects of e-banking

### Electronic banking ...

- transcends sectors and national borders
- depends on IT
- is dynamic
- is customer-oriented
- enhances competition

### The above features give rise to the following types of risk in e-banking:

- strategic risk
- operational risk (particularly technical security and outsourcing risks)
- legal risk
- reputational risk
- systemic risk

Deutsche Bundesbank

Therefore, some institutions are pursuing the strategy of imitation. Such banks not only save costs on IT development but also have the advantage of knowing that a technology has proved to be feasible and that the market has shown initial signs of acceptance. A major disadvantage of this strategy is that if circumstances cause the technology to be entered into production too late, the market segment could already be occupied.

The specific manner of conducting customer relations in e-banking presents a key strategic challenge to a bank's management, since, for example, greater market transparency causes consumer loyalty to sink. This effect is aggravated by what are called "aggregators", which can prepare individualised compilations of Internet offers in a single web site. This

would greatly undercut the value of the seller's brand name. Also, this clearly limits banks' opportunities for cross-selling.

The rapid pace of innovation in e-commerce is requiring banks to make e-banking strategy decisions as quickly and intelligently as possible, since technological innovations or changes in customer tastes caused by "waves of fashion" often make radical adjustment inevitable. Frequently there is no way of predicting which technology and which terminals (e.g. mobile phones, television sets, PDAs) will ultimately prevail.

*Responsibility for strategic decisions rests with banks' senior management*

Misteps in the planning and implementation of strategy entail considerable risks. The responsibility for these decisions, and also the management of these risks, rests with senior management. That being the case, all that supervisors can do is to monitor awareness among senior managers of the risks as well as management's ability to judge them accurately and to respond adequately.

*Operational risk*

Operational risk in the narrower sense encompasses all risks originating directly in business operations. Important sources of operational risk include technical malfunctions or human error, IT problems, fraud and inadequate organisational structures. If operational risk is not managed efficiently, this could result not only in financial losses but also in disruptions in banking operations (e.g. a call centre cannot be reached, or a host system is down). Operational risk is by no means new; however, the increasing use of IT in recent years has been making it more and more conspicuous.

The effectiveness of the security infrastructure, as an important aspect of that operational risk specific to e-banking, is of overriding importance to banking supervisors. There is the threat of data theft through eavesdropping, hacking, sniffing or spoofing, or of data corruption, destruction or misuse. Denial of service attacks are another source of risk. In a denial of service attack, servers are flooded with fake queries, thus overloading the system and preventing authorised users from conducting further transactions. Recent incidents point to another very real threat: a targeted virus attack by hackers or crackers.

*Effectiveness of security infrastructure*

In spring 2000 major IPOs were fraught with capacity constraints. The call centres and the IT systems of the institutions involved were unable to cope with the flood of transaction orders. Owing to a lack of accessibility, some direct banks were ordered by the Federal Securities Supervisory Office (*Bundesaufsichtsamt für den Wertpapierhandel*, or *BAWe*) to ensure that the systems would be able to function even at peak capacity. Recently, *BAWe* declared that in the meantime the institutions had improved their accessibility markedly and, in so doing, had successfully complied with their obligation to properly discharge the securities services they provide.<sup>11</sup>

The German banking industry is aware of the extraordinary importance of a viable security infrastructure, both in its own interest and in the interests of promoting customer confidence. Since customers' concern about the

*Security initiatives of the banking industry ...*

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<sup>11</sup> Press release issued by *BAWe* on October 27, 2000, "Erreichbarkeit der Direktbanken wesentlich verbessert" (available only in German).

misuse of data and about insufficient security is still the greatest barrier to the further spread of Internet banking, credit institutions have taken comprehensive measures to reduce IT risks and are constantly striving to update security standards. Thus, some direct banks have formed a task force to exchange information on the risks to banking business posed by the use of the Internet and to formulate strategies to avert them. This May, the Central Credit Committee (*Zentraler Kreditausschuss, or ZKA*), approved version 2.2 of the multibank Home Banking Computer Interface (HBCI) standard, which integrates further business transactions – for instance, in payments and securities business. This interface specification is designed to ensure that data are transmitted securely over the Internet between customers and banks (encrypted and secured using a digital signature) regardless of the terminal used.

Like the security infrastructure, the outsourcing of IT services, such as software development, back-office operations or the marketing of financial services, contains a certain element of operational risk. On the one hand, this shift towards outsourcing is to be welcomed, as it can enhance efficiency and enables smaller institutions, with correspondingly low budgets for IT spending, to offer high-performance e-banking applications as well.

On the other hand, the very dependence on third parties such as software providers which outsourcing fosters may increase operational risk. Also, the banks' new partners may possess the necessary technical expertise in the technology sector but might not be sufficiently knowledgeable of the complex, bank-specific risks. Thus, the possibility of banks outsourcing risky operations without the IT service providers being fully aware of the banking risks involved cannot be ruled out. Furthermore, the complexity and thus the outsourcing risks are increased in those cases where banks have chosen to work with different IT partners which are completely independent of one another.

It is also important for banking supervisors to bear in mind that the various new forms of cooperation between banks and providers of technology are causing completely new business relationships to develop between

*... and their  
limits*

The fact that not enough customers have chip card readers is one of several reasons why the HBCI standard has so far not become widely accepted. Even then, the HBCI standard alone cannot guarantee absolute security, since the real Achilles heel in IT security is the customer's PC or customers' careless use of security media (for instance, a customer may leave his chip card in the card reader although he is not conducting an HBCI banking transaction). If a hacker succeeds in breaking into a customer's PC using a "Trojan horse",<sup>12</sup> he may also be able to access that customer's e-banking information. The most recent attacks by hackers on major industrial corporations' internal data show just how real and how dangerous this type of manipulation is.

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<sup>12</sup> "Trojan horses" are programs installed on an (unsuspecting) user's PC. They are used by hackers to communicate with the user's PC and thus to carry out their malicious activities. Unlike computer viruses, Trojan horses do not replicate themselves but are disguised as benign programs, such as screen savers, and become active once the customer opens them or downloads them from the Internet.

banks and non-banks. Therefore, banks must choose and monitor their partners carefully, and they continue to bear the total responsibility for banking risks, even after having outsourced certain operations.

A further aspect of outsourcing which requires special attention is compliance with service-level agreements. Such agreements, for instance, set specific time limits for resolving problems and also ensure regular updates and bug fixes.

Outsourcing is not a new banking risk, yet the volume of outsourced operations and the scope of the individual outsourcing agreements have reached unheard-of proportions in e-banking. The degree of outsourcing permissible under prudential legislation will be spelled out in a Federal Banking Supervisory Office (FBSO) circular, a draft of which has been sent to all banks.<sup>13</sup> In it, the FBSO will explain whether, and if so, under what circumstances the outsourcing of activities complies with the Banking Act. The German banking industry has so far been very circumspect as far as outsourcing decisions are concerned since the banks themselves do not want to become dependent on individual IT service providers.

#### Legal risk

Legal risk derives from the fact that laws governing the validity and enforceability of electronically concluded agreements are only now being drafted in many countries. In Germany, where this area has been regulated from a very early stage by the Signature Act,<sup>14</sup> the draft of a Law on the Framework Conditions for Electronic Signatures<sup>15</sup> to

implement EU Directive 1999/93/EC of December 13, 1999 was already passed by the Federal cabinet on August 16, 2000.

Generally speaking, the regulatory approaches continue to vary from one country to the other. The resultant uncertainty is heightened in those cases where cross-border transactions involve countries where the credit institution has no physical presence. Additionally, a lack of familiarity with foreign legal systems leads to risks regarding consumer and data protection issues.

Prudential jurisdiction over cross-border business activities is also subject to legal uncertainty, as has become painfully evident in e-banking. To some foreign banking supervisory authorities, the solicitation of customers in their jurisdiction already constitutes a banking operation for which a licence is required. Thus, a version of a bank's website in a certain language could already be construed as a banking transaction requiring a licence in all countries where that language is spoken. Other authorities, by contrast, only consider the transaction of business as an operative action for which a banking licence is required. Consequently, the lack of legal certitude causes banks to run the risk of violating foreign laws.

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<sup>13</sup> See the following draft circular: "Entwurf eines Rundschreibens des BAKred zur Auslagerung von Bereichen auf ein anderes Unternehmen gemäß § 25a Abs. 2 KWG" (available only in German) ([www.bakred.de](http://www.bakred.de)); see also: "Bundesaufsicht Pronouncement of October 16, 1992 on the Employment of Cross-Border Electronic Data Processing Facilities for Bank Accounting Purposes".

<sup>14</sup> Digital Signature Act (*Gesetz zur digitalen Signatur*), which can be downloaded from [www.iukdg.de](http://www.iukdg.de).

<sup>15</sup> The draft law and the official justification may be found on the Internet at [www.iukdg.de](http://www.iukdg.de).

Furthermore, the prosecution of money laundering crimes in e-banking places banks under a special obligation to comply with due diligence requirements by verifying the identity and the trustworthiness of their customers ("know your customer").

*Reputational  
risk*

Banking business is especially sensitive to fluctuations in confidence. Therefore, reputational risk, particularly in a relatively new field of business, represents a special challenge for banks. Customers' confidence in their bank can be shaken if the bank is not able to provide secure and trouble-free e-banking services. The same is true if services such as responding to inquiries or processing orders are not performed at the speed that customers have come to expect in the "Internet Age".

Moreover, the impact of a bank's IT malfunctions on the general public is a feature specific to e-banking. For instance, if a bank's web-based transaction system breaks down, the users of the service are affected immediately. This sets e-banking systems apart from traditional back-office host systems, with which customers do not come into direct contact.

*Systemic risk*

On the downside, banking supervisors must analyse not only individual risks but also macroprudential implications (systemic risk) of e-banking. There is no disputing the fact that e-banking has changed the risk structure of the banking sector, by, for instance, increasing operational risk. Moreover, banking supervisors will have to react more quickly in order to keep up with the torrid pace of innovation on the Net.

On a more positive note, e-banking opens up new sources of profits to the banking sector, since banks can achieve cross-selling effects by, for instance, joining forces with non-banks. In addition, the competition-enhancing effect of e-banking may encourage a sort of housecleaning as far as the structure goes by, for instance, forcing a bank to streamline its branch office network. On the whole, e-banking is becoming a more and more important segment for macroprudential analysis, and should be given closer scrutiny in future; however, at present this segment would not appear to pose any exceptional systemic risk.

#### Prudential supervisory initiatives

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Banking and financial supervisory agencies have recognised, in the light of the risk situation described above, that they must act in a forward-looking manner to ensure that electronic banking transactions remain secure in future, too, and to instil in broad segments of the public confidence in the applicability of new technologies. In their national and international activities alike, they must take pains to ensure that the risks peculiar to e-banking continue to be monitored adequately while at the same time taking care not to hinder technological progress unduly. To that end, the supervisory standards must incorporate technological considerations to a greater extent than before and must, above all, be readily adaptable to market developments. Furthermore, it must be guaranteed that the prudential strategy is implemented without inhibiting competition or innovation. Banking

*Objectives ...*

*... and criteria  
of the  
prudential  
strategy*

supervisors must remain in close contact with the financial sector in the field of e-banking, as they are in other areas of prudential supervision, if they are to keep abreast of new trends. Consumers, too, will be expected to take on greater responsibility in their use of electronic media – especially as regards the security infrastructure. In that respect, the “enlightened and responsible” citizen is an essential complement to prudential supervision.

#### Prudential supervisory standards for e-banking in Germany

The Banking Act stipulates that all enterprises which conduct banking business or provide financial services commercially require a written licence from the FBSO. It does not matter whether these services are rendered electronically or via a traditional branch office. As a result, all institutions in Germany which conduct banking business requiring a licence – including direct banks and direct brokers – are subject to routine banking supervision. The “Generally accepted principles for computer-aided accounting systems” (*Grundsätze ordnungsgemäßer DV-gestützter Buchführungssysteme*, or GoBS)<sup>16</sup> adopted in 1995 also cover e-banking business. However, no specialised prudential requirements that address the specific risks of e-banking business exist at present.

Given the aforementioned risks and the expected rise in the volume of e-banking business, it does not seem appropriate simply to transfer this prudential strategy – devised for

a bricks-and-mortar bank – to cyberspace. For this reason, German banking supervisors are developing a new strategy tailored to the specific risks of e-banking.

To that end, among other measures, “minimum requirements for the conduct of e-banking activities” must be formulated, in which the examination of the IT security infrastructure will play a major role. Moreover, any prudential standards for e-banking should list fundamental requirements that an IT security strategy may be expected to meet. That would entail, for instance, requiring the bank to explain its e-banking strategy and how it fits into the bank’s overall business strategy. Furthermore, the bank should provide a detailed description of the basic features of its security strategy, which would include identifying individual risk-relevant components, analysing each component’s risks and using these analyses as a basis for developing and documenting work instructions. Beyond that, banks should be able to indicate the level of customer education, i.e. how well-versed customers are in the correct use of security technology. The general security strategy includes the training of IT staff and the filling of key positions. Another security strategy requirement should be that banks provide a detailed rationale for their outsourcing policy.

In addition to these general security strategy requirements, which, in a sense, define the

*Fundamental requirements the IT security strategy must meet*

*Requirements to be met by IT operations*

<sup>16</sup> Published in the Bundessteuerblatt 1995, Part I, No. 18, page 738 ff. (available only in German), these principles ensure that the generally accepted accounting principles (*Grundsätze ordnungsgemäßer Buchführung*) are applicable to all computer-aided accounting methods.

overarching framework for minimum requirements, the IT operations themselves and IT developments should be examined as well. These comprehensive investigations should extend to include the network structure, the operating system, the interfaces between the e-banking system and the overall system, the separation between the testing and productive systems, the effectiveness of the firewalls and the response to external assaults.

However, it will not be enough to conduct these efforts at the national level; additionally, banking supervisors need to cooperate at the international level when responding to these challenges.

### International cooperation among supervisors

*The Basel Committee on Banking Supervision is developing a prudential framework for...*

The Basel Committee on Banking Supervision attaches great importance to developing harmonised approaches to the supervision of e-banking. In keeping with this emphasis, a working group was established at the end of 1999; in cooperation with other supervisory boards and the financial sector, it began by taking stock of ongoing developments on the markets and in the supervisory arena with a view to identifying problem areas and to determining where supervisors needed to take action. The result has been to isolate two main areas to which banking supervisors will be paying particularly close attention: first, the adaptation of the Basel Committee guidance for risk management to cover the risks specific to e-banking; second, expansion of the current Basel Committee guidance to

allow for cross-border cooperation among supervisors.<sup>17</sup>

The Basel Committee is of the opinion that the change in the banks' risk profile caused by e-banking call for an adjustment of the international regulatory framework for prudential supervision. At this early stage in the framework's development, the point is not to adopt specific regulations or even to define technical standards. Instead, a dialogue should be held with industry with the aim of drafting prudential supervisory recommendations that will set the framework for a sound risk management strategy. At the outset of this work, the initial emphasis will be placed on technical security and outsourcing.

*... risk management and ...*

As the work in Basel progressed, it soon became evident that the cross-border nature of e-banking transactions would pose a special challenge to banking supervisors. In a series of papers, the Basel Committee establishes a framework for cross-border cooperation among supervisory authorities. These guidelines, which were translated into European prudential supervisory law by means of EU directives<sup>18</sup> – and later into German law – are still in force and, in principle, are applicable to e-banking activities as well. However, this regulatory framework was conceived at a time when the technical means of gaining such direct and swift access to foreign markets without simultaneously establishing a physical presence did not yet exist. This is

*... cross-border e-banking issues*

<sup>17</sup> See: Electronic Banking Group Initiatives and White Papers, [www.bis.org](http://www.bis.org).

<sup>18</sup> Two prominent and authoritative examples are the Second Banking Coordination Directive and the Investment Services Directive.

closely correlated with another problem: not only banks but non-bank providers of financial products as well are capable of selling their products across national borders on the Web. The linking of banking business, which requires a licence, to other business activities for which no licence is required makes banking supervision an even more complex matter.

The fact that the internationally accepted licensing terms for banks in the various legal systems are sometimes based on dissimilar definitions of concepts such as the "conduct of banking business" (which may differ from one country to another) may give rise to legal uncertainty concerning the jurisdiction of supervisory authorities. Besides this, the implementation of national legal regulations is beset by what are mainly practical problems: for instance, it is very difficult to prevent enterprises domiciled in a third country whose supervisory authority does not cooperate with the local banking supervisory agency

from acquiring access to the home country's market or to govern such access. With this in mind, the Basel Committee will study the existing framework for cross-border cooperation among supervisory authorities to determine whether any amendments will be necessary to cover e-banking.

The trend in e-banking has confronted national banking supervisory authorities and international supervisory fora, like the banking sector itself, with great challenges, the scope of which cannot yet be entirely foreseen owing to the rapid pace of technological innovation. However, it is becoming increasingly clear that banking supervisors will have to devote more attention to the use of IT by credit institutions and its implications than they had in the past. In the end effect, the trend towards a more qualitative approach to banking supervision – having prevailed in other areas of prudential supervision – will continue to increase here as well.

*Implications for  
prudential  
supervision*